Dzalaeva F.K.

Function and Aesthetic. Treatment of patients with full month reabilitation



F. K. Dzalaeva

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Dzalaeva Fatima Kazbekovna

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Introduction

Dental practitioners must use esthetic parameters in their daily practice and understand the function to identify maxillofacilal area dysfunction. In this book, I show how could a dental practitioner apply in their daily practice the knowledge of anatomy, physiology, laws of motion and gnathological aspects adopted by Rudolf Slavicek's approach. When dealing with the issue of patients' treatment, we apply interdisciplinary approach and joint work with allied health professionals such as somnologists, neurologists, osteopathic physicians, psychologists, cosmetologists and radiologists. This gave us an opportunity to address the problem of rehabilitation of patients with total restoration of tooth range in a comprehensive way.

In our work, we used the approach and philosophy of R. Slavicek in clinical, functional and instrumental analyses and also the procedure of collection of data and esthetic parameters. Both analyses, along with the conclusions of allied health professionals, provided an opportunity to make a comprehensive plan of diagnosis and treatment and consider the patient as an integrated cybernetical system.

The most important things for me were achieving comprehension and obtaining answers to the following questions: 1. what problem the patient has at the moment; 2. where are we going in our treatment; and 3. how are we going to get there. To solve these problems, we applied the basics of natural adaptation: arthral, dental-alveolar and vertical.

The purpose of the book is to show the use of gnathological aspects in daily practice of a dental practitioner. And also to show long-term results after 5 to 12 years. This approach puts a special focus on continuity in the possibility of holding consultations between practitioners remotely.

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Clinical case №1

Patient's birth date: 12/09/1975

Date of examination: March 2008

The patient applied to the medical center with complaint of pain in mastication muscles and chipping of composite restorations. Physical examination revealed:

- > The canine teeth have palatal inclination.
- > The midline is shifted to the left.
- > Dental class I on the left and Dental class II on the right.
- > There is some chipping of composite restorations.
- Maxillary and mandibular dental arches in sagittal and transversal planes.
- > Absence of reproducible central occlusion.
- > Centric relation is not reproducible.
- > Absence of canine and anterior guidance.









There is bruxism in the case history. The patient assesses their psychological state ascalm.

Den	tal Hist	ory An	alysis			Valua	ation	Yes	No
1.	Do you	have pr	oblems v	when you	chew?		2	Х	
2.	Do you	have pr	oblems v	when you	are				Х
	talking?								
3.	Do you	have pr	oblems i	n closing	your		2	Х	
	teethproperty?								
4.	Are any of your teeth especially sensitive?								Х
5.	Do you	have pr	oblem w	hen you o	pen your				Х
	mouthv	ery wid	e?						
6.	Do you	r jaw jo	ints make	e noise and	d if so,				Х
	on what	tside?							
7.	Do you	have pa	in in the	area of yo	our jaw				X
-	joints?								
8.	Do you suffer from headaches?								X
9.	. Do you suffer from cramps or spasm in						X		
	your head, neck or throat?								
10.). Do you have in general problems with					2	X		
	yourposture?					_			
	Occlusal Index 2.00								
11.	1. Have you ever had serious accident?						X		
12.	Did you	i have o	ne or mo	re oral int	ubations?				X
13.	Have yo	ou ever	had ortho	odontic tre	eatment or .	••			X
14.	Have yo	ou had a	treatmen	nt with spl	lint?				X
15.	Are you	ı grindir	ng or pres	ssing with	your teeth?	?		X	
16.	Do you	think th	at treatm	nent is nec	essary?			X	
17.	Do you	think th	at there	is a seriou	s disorder c	or illno	ess?		Х
18.	When the	he last t	ime you	had dental	treatment	and w	hat was	s done'	?
	How we	ould you	ı describ	e your psy	chic behav	ior?			
19.	happy	sad	calm	excited	self-contro	lled	lack of	self-co	ontrol
			Х						

Mus	scle Diagnosis	Right		Left	
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)	Х		X* (Closing)	
4.b	M.masseter (deep)	X		X* (closing and laterotractor)	
5.	Tuber maxillae	X		X* (protractor)	
6.	M.pterygoideus medialis	X		X* (protractor)	
7.	M.mylohyideus				
8.	M.digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
15.	Comparative palpation of jawjoints*				
	a) Lateral poles, statically	X			
	b) Lateral poles, in rotation	X			
	c) Retral joint space				
	d) Lig.temporo-mandibulare	X			
* Li	gament and capsule, TMJ positio	n			

Table 2

Sets of muscles:	
Muscles palpation	
Posture	1,2,7,12,13,14
Jaw-closing	3a, 3b, 4a, 4b, 5
Jaw-opening / protrusion	8, 9, 10
Retraction	3c, 8
Medio- / Laterotraction	6, 3a, 4a
Sublingual bone position	8, 9, 10, 11, 13
Function	7, 8,9,10,11,14
POSTURE, PROTRACTOR, SUB-L	INGUAL POSITION

Muscle analysis revealed activity of m.masseter, m.pterygoideus, medialis. These muscles include ones responsible for jaw opening, laterotractors, protractors and also ligaments and muscles dealing with the position of the temporomandibular joint. Thus, dental history and physical examination revealed the **following problems:**

- Chipping of composite restorations.
- Muscles problems including jaw-closing, laterotractors.
- Esthetic problems.
- Crowding of mandibular bone teeth.
- > Transversal mismatch of maxillary and mandibular dental arches.
- > Palatal inclination of maxillary canine teeth.
- ➢ Absence of the tooth 1.4.
- Absence of posterior area support.

This means that there are indications for performing a considerable functional instrumental analysis: model analysis, condylography, cephalometric analysis.

Condylography

Condylography imaging revealed the following:

- Increasing protrusion-retrusion path length
- Weakening TMJ ligamentous apparatus





Right mediotrusion



Redetrusion in the right TMJ in case of left mediotrusion. Redetrusion in the left TMJ in case of right mediotrusion. Muscle problems and ligaments weakening.



We can see from the time curve that these are muscular problems, not ligamentous. There is hypermobility in the ligament, over-opening of mouth due to the TMJ ligamenthyperextension.

Cephalometric Analysis

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	90.2	
Facial Depth	91.5°	85.8	1-*
Mandibular Plane	21.5°	26.0	1D*
Facial Taper	68.0°	68.0	
Mandibular Arc	31.2°	33.1	
Maxillary Position	65.0°	66.7	
Convexity	-1.00 mm	0.4	
Lower Facial Height (by R. Slavicek)	45.2°	46.5	
Lower Facial Height to Point D	51.7°	48.3	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	128.0	
Upper Incisor Protrusion	4.3 mm	5.4	
Upper Incisor Inclination	23.1°	23.8	
Upper Incisor Vertical	mm	2.0	
Lower Incisor Protrusion	1.2 mm	1.6	
Lower Incisor Inclination	24.1°	28.0	
Upper Molar Position	21.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	9.2	
Idealized Occlusal Plane – Axis Orbital Plane	°	13.7	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	35.5	
Radius of Curve of Spee	mm	56.3	
Lip Embrasure	0.0 mm	0.5	
Occlusal Plane Xi Distance	-1.4 mm	-4.7	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	°	52.4	
Horizontal Condylar Inclination left	⁰	52.1	
Horizontal Condylar Inclination	⁰	52.3	
Relative Condylar Inclination	⁰	43.0	
Relative Condylar Inclination 6	⁰	32.7	
Relative Condylar Inclination 7	⁰	26.6	
Relative Condylar Inclination 8	⁰	52.3	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-3.9	



Cephalometric analysis revealed the following:

- Lower face height is normal;
- > The interincisal angle = 128° C, normal;
- OPI (Occlusal plane inclination) on the right side = 6°C, OPI on the left side = 9°C
- This is a symmetrical case. Both left and right sagittal condylar paths SCI (sagittal condylar inclination) = 52
- ▶ Right DOA (opening angle) = 16° C, left DOA = 13° C
- The maxilla position is neutral
- > The mandible position is neutral
- Dental class II on both sides
- Anterior guidance was determined with the help of Weber template.

Analysis of casts mounted in the centric relation of mandible to maxilla revealed the following:

Absence of contacts on incisor tooth is found in the centric relation of mandible to maxilla position. Teeth 37, 46, 47 have premature occlusal contact. These casts are used to make a myopathic splint. Splint therapy was conducted.



Impressions were picked-up after splint therapy. Casts were remounted in a new therapeutic position for a diagnostic wax-up in 3 weeks after wearing the myopathic dental splint.



Wax-up parameters

Dental class I Teeth ratio 1:2

Teeth 16 - 46, 17 - 47 belong to Class II of teeth occlusion

Maxillary passive arch must be adjusted to fit the mandibular active arch. We increase the vertical dimension by +2 mm with an incisal pin. The diagnostic wax-up is performed on the models in articulator according to the analysis of condylographic and cephalometric data. We obtain silicone indexes which are used for preparing the teeth of the maxilla and mandible. Then we make the first set of temporary crowns. $OPIR = 6^{\circ}$

 $OPIL = 9^{\circ}$

OPI 46 must be changed to 9, DOA must be changed to 13° SCI R =L = 52° Wax casting



Right side OPI=6°



Left side OPI=9°

Lower face height is unaffected.

We carry out occlusal plane modeling by using 2 points.

The first point of occlusal plane is lower incisors, and the second one is the distal cuspfor the mandibular first molar OPI $R = 9^\circ$, i.e.

OPI $R = 6^{\circ}$

We change the occlusal table of the tooth 46 by 9 degrees.





The first temporary crowns set was made using a silicone index.

Canine teeth and the second molars are used as reference points for positioning template to the teeth and rebasing temporary restorations.



The second set of temporary crowns was made for esthetic reasons. Teeth were fully prepared, impressions were obtained, models were mounted in an articulator and the wax-up was made using silicone indexes.



Provisional crowns for protrusion restriction, laterotrusion restriction and canine guidance were checked in the articulator.

Custom incisal table was used for the wax-up.



Table	5
rable	J

	Inclination of the protrusive guidance elements (in degree)								
-		Blue	Green	Orange	Yellow*				
211	Front F	46°	51°	55°	60°				
THE .									
		Inclination	of the lateral of	elements (in deg	gree)				
		Blue	Green	Orange	Yellow*				
-	Tooth 3	51°	55°	58°	65°				
	Tooth 4	41°	44°	47 °	52°				
AAMILA'	Tooth 5	33°	37°	40°	46°				
	Tooth 6	25°	29°	33°	39°				

Laterotrusion

Right side:

Tooth 1.6 - 25°C blue tableTooth 1.5 - 33°C blue tableTooth 14 - 41°C blue table.

Left side:

Tooth 2.6 - 33°C, orange

Tooth 2.5 - 40°C, orange

Tooth 2.4 - 47°C

Anterior restriction = $55^{\circ}C$

Canine guidance

R (right) = 51° , blue

Canine guidance

L (left) = 58° , orange

Wax cast is transferred into the porcelain press and the final restoration is made.



Final dental occlusion checked in static and dynamic positions of the articulator.



We create consistent guidance on final restorations.

Consistent opening on 16 and 26 Consistent opening on 25 and 14



Protrusion 2 mm

Protrusion 4 mm



Restriction of the canine guidance on protrusion 4 mm.



Retrusion restriction





Final dental restorations 2008

Before / after results

2008



2018



Clinical case №2

Patient's birth date: 17/05/1955

Date of examination: September 2009

The patient applied to the medical center with complaints of poor masticatory performance and esthetic look.

Physical examination revealed:

- ➤ Absence of teeth support in a lateral area, extrusion 35 and 23
- Palatal inclination of canine teeth



In this case, we determine a sequence algorithm to make a prosthetic appliance with bilateral teeth absence using implant-supported prosthetic restorations.

For making a prosthetic appliance, clinical instrumental and functional analysis, cephalometric analysis, wax-up and splint therapy were used.

We collected clinical dental history data which did not reveal any diseases.

Special Medical Analysis						
Doy	Do you have or did ever have an illness with regard to point 1-12?					
		Yes	No			
1.	Infections		Х			
2.	Cardo-vascular systems		Χ			
3.	Respiratory system		Х			
4.	Digestive system		Х			
5.	Metabolic system		Х			
6.	Allergies		Х			
7.	Urogenital problems		Χ			
8.	Central nervous system		Х			
9.	Psychological problems (therapy)		Х			
10.	Rheumatic disease		Χ			
11.	Hormonal disease		Х			
12.	Special problems		Χ			
Main	n concern: esthetic, low chewing efficacy					

Dent	tal History Analysi	S			Valuatio n	Yes	No
1.	Do you have prob	olems when	you chev	N?	1	Χ	
2.	Do you have problems when you are talking?						Х
3.	Do you have prot teeth property?			Х			
4.	Are any of your to sensitive?	eeth especia	ully				Х
5.	Do you have probyour mouth very v	blem when y wide?	you open				Х
6.	Do your jaw joint on whatside?	s make nois	se and if s	so,			Х
7.	Do you have pain in the area of your jaw joints?						Х
8.	Do you suffer from headaches?						Х
9.	Do you suffer from cramps or spasm in your head, neck or throat?						Х
10.	Do you have in general problems with your posture?						Х
	Occlusal Index				1.00		
11.	Have you ever ha	d serious ac	cident?				X
12.	Did you have one	or more or	<u>al intubat</u>	tion	ls?		X
13.	Have you ever ha	d orthodont	tic treatm	ent	or		X
14.	Have you had a tr	eatment wi	th splint?	•			X
15.	Are you grinding	or pressing	with you	ır te	eth?		Х
16.	Do you think that	treatment i	s necessa	ry?		X	
17.	17. Do you think that there is a serious disorder or						Х
	When the last tim	e you had c	lental trea	atm	ent and w	hat wa	as done?
18.	Howeverla			- 1	1.000		
	happy sad	calm	excited	s be se co	elf- ontrolled	lack	c of self- ontrol
19.		Х			Х		

Dental implants were installed in another medical center without any diagnosis and surgery template known.

Muscle palpation revealed the activity of m.pterygoideus medialis protractor muscle and bypass interference mechanism using m.mylohyoideus.

Muscle Diagnosis		Right		Left	
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae				
6.	M.pterygoideus medialis	Х		X (protractor)	
7.	M.mylohyideus			X (avoidance pattern)	
8.	M.digastricus			•	
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw joints				
	a) Lateral poles, statically				
	b) Lateral poles, in rotation				
	c) Retral joint space				
	d) Lig.temporo-mandibulare	Х			

Table 4

Prelin	ninary Brainstem Nerve Analysis
1.	N.olfactotrious (analysis)
2.	N.opticus (analysis)
3.	N.occulo-motorius (clinical mobility)
4.	N.trochlearis (clinical mobility)
5.	N.trigeminus (clinical palpation and sensitiveness)
6.	N.abducens (clinical mobility)
7.	N.facials (clinical mobility)
8.	N.stato-acusticus (clinical check of the equilibrium and hearing)
9.	N.glosso-pharyngeus (clinical and analysis)
10.	N.vagus (analysis)
11.	N.accessorius (clinical and analysis)
12.	N.hypoglossus (clinical and analysis)



Thus, clinical dental history and physical examination revealed the following issues:

Absence of support in posterior teeth in both the maxilla and mandible, absence of retrusion restriction, absence of anterior guidance.

- ▶ Tooth 3.5 extrusion.
- > Parodontal problems.
- ➢ Poor oral hygiene.
- \succ Esthetics.
- Poor masticatory performance.

Treatment objectives

- Occupational oral hygiene: periodontium treatment.
- Determine occlusal vertical dimension.
- Determine OPI and AG.
- Determine the centric relation.
- Create support in the area of posterior teeth.
- ➢ Retrusion restriction.

Treatment Plan

- Parodontal treatment.
- Clinical functional and instrumental analysis.
- > 2nd condylography.
- > Splint therapy.
- ≻ Wax up.
- Provisional crowns.
- ➢ Final dental restorations.

Treatment

- 1. Picking up impressions from the upper and lower dental arches.
- 2. Fabricating a rigid plastic CR centric on temporary metal implant abutments 4.6, 3.7, 1.6 and 2.6. to determine centric relation.
- 3. Mounting of casts in articulator using plastic centric.
- 4. Fabricating a myopathic dental splint.
- 5. 14-days splint therapy and remounting of casts a for wax-up in the therapeutic position.
- 6. Making temporary crowns.

7. Final dental arches rebuilding procedure.



Condylography

Loose ligaments and function of protracting and retracting muscles.

There is absence of support in the posterior region of tooth rows, excursion and incursion lines do not match. Start and end of movement are not coincident.

Left mediotrusion

Right mediotrusion



Protrusion when speaking



Lower protrusion when speaking: the mandible goes back and down, no posterior support and anterior guidance are provided, hence the mandible goes down and forward when speaking.



Gamma rotation

Strong positive gamma rotation per 1 mm of movement, interference in the frontal area.

Cephalometric study analysis

revealed that lower face height was normal, maxillar and mandible positions were neutral.

Slavicek Interactive Verbal Analysis



Explanation

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is brachyfacial Skeletal class is I.

The maxilla is positioned neutral.

The mandible is positioned neutral Lower facial height is normal Dental class unknown.

The protrusion of the upper incisor is increased.

The inclination of the upper incisor is increased.

The protrusion of the lower incisor is strongly increased

The inclination of the lower incisor is increased.

The interincisal angle is diminished.

Occlusal concept: Unknown (data missing).

No functional statement.

Determinants	Norm	Value	Trend
Facial Axis	90.0°	83.0	2D**
Facial Depth	89.0°	95.3	2+**
Facial Taper	68.0°	60.2	2D**
Mandibular Plane	24.0°	24.4	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	401.4	2+**
Facial Lenghth Ratio	63.5%	58.3	2-**
Y Axis to S N	67.0°	74.4	2+**
Y Axis (Downs)	61.2°	55.3	1-*
S N to Gonion Gnathion Angle	32.6°	41.4	2+**



Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	83.0	2D**
Facial Depth	89.0°	95.3	2+**
Mandibular Plane	24.0°	24.4	
Facial Taper	68.0°	60.2	2D**
Mandibular Arc	29.0°	33.7	1B*
Maxillary Position	65.0°	62.4	1-*
Convexity	0.0 mm	1.9	
Lower Facial Height (by R. Slavicek)	46.3°	51.0	
Lower Facial Height to Point D	52.8°	53.0	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.3°	112.9	1-*
Upper Incisor Protrusion	5.6 mm	10.6	1+*
Upper Incisor Inclination	26.4°	32.7	1+*
Upper Incisor Vertical	Mm		
Lower Incisor Protrusion	0.9 mm	7.1	2+**
Lower Incisor Inclination	22.3°	34.3	1+*
Upper Molar Position	18.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰		
Idealized Occlusal Plane – Axis Orbital Plane	⁰	17.5	
Distance Occlusal Plane – Axis (DPO)	40.9 mm		
Radius of Curve of Spee	mm		
Lip Embrasure	0.0 mm		
Occlusal Plane Xi Distance	-1.4 mm		
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	62.5	
Horizontal Condylar Inclination left	⁰	65.3	
Horizontal Condylar Inclination	⁰	63.9	
Relative Condylar Inclination	⁰	63.9	
Relative Condylar Inclination 6	⁰	63.9	
Relative Condylar Inclination 7	⁰	63.9	
Relative Condylar Inclination 8	⁰	63.9	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.3 mm	1.2	1+*
- Dolichocephalic facial type.
- \succ The interincisal angle is normal.
- ➢ Asymmetric case history, SCI R=62° SCI L=65°.
- ➢ Occlusal plane -17,5°.

Table	7
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Incisal Pin	Tab	ole											
Incisal Pin Height	0.0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
Lower Facial Height	51.1	51.5	51.9	52.3	52.7	53.1	53.5	54.2	55.0	55.7	56.3	57.0	58.3
LFH (Norm)	46.3	46.4	46.5	46.6	46.7	46.8	46.9	47.1	47.3	47.5	47.7	47.9	48.3
LFH (Variation)	-0.0	0.4	0.8	1.2	1.6	2.0	2.4	3.1	3.9	4.6	5.2	5.9	7.2
Menton Vertical	0.0	0.3	0.7	1.0	1.3	1.6	1.9	2.5	3.0	3.6	4.1	4.5	5.4
Pogonion Sagittal	0.0	-0.8	-1.6	-2.4	-3.2	-4.0	-4.8	-6.5	-8.1	-9.8	-11.4	-13.1	-16.4
IncisionInf. Vertical	0.0	0.5	1.0	1.5	2.0	2.5	2.9	3.9	4.8	5.6	6.4	7.2	8.8
Incision Inf. Sagittal	0.0	-0.6	-1.1	-1.7	-2.3	-2.8	-3.4	-4.6	-5.8	-7.0	-8.3	-9.5	-12.1
Incisal Pin Height	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-20.0
Lower Facial Height	51.1	50.7	50.2	49.8	49.3	48.9	48.4	47.5	46.5	45.4	44.3	43.2	40.8
LFH (Norm)	46.3	46.2	46.1	46.0	45.9	45.8	45.7	45.5	45.2	45.5	44.8	44.6	44.2
LFH (Variation)	-0.0	-0.4	-0.9	-1.3	-1.7	-2.2	-2.7	-3.6	-4.6	-5.7	-6.7	-7.9	-10.3
Menton Vertical	0.0	-0.4	-0.7	-1.1	-1.5	-1.9	-2.4	-3.1	-4.4	-4.9	-5.9	-6.9	-9.2
Pogonion Sagittal	0.0	0.8	1.6	2.1	3.2	3.9	4.7	6.2	7.7	9.2	10.7	12.1	14.8
IncisionInf. Vertical	0.0	-0.5	-1.1	-1.6	-2.1	-2.7	-3.3	-4.4	-5.7	-6.9	-8.2	-9.6	-12.5
Incision Inf. Sagittal	0.0	0.5	1.6	1.6	2.1	2.7	3.2	4.1	5.1	6.0	6.8	7.6	9.0

Impressions of the maxilla and mandible with both stock trays and customized trays were obtained. Custom impression coping was made.



Rigid centric fabricating.

We form the temporary crown emergence profile and expand it next to the gingival margin per 0.5 mm in a single action.

If we want to expand the emergence profile by 2 mm in diameter, we need to visit the prosthodontist 4 times.

When forming soft tissue profile, gingival ischemia may occur. After the formation of an emergence profile, ischemia should disappear in 6-8 minutes. If ischemia doesn't disappear, we reduce the crown diameter in the gingival margin.







Impressions from upper and lower dental arches were obtained using standard tray and Impregnum impression material as well as transfer coping. "Red artificial gingiva" is used for making master casts.

Making CR centric with plastic tooth placed on metal temporary implant abutments 4.6, 3.7, 1.6 and 2.6.

Casts are remounted after determining the centric relation. Myopathic dental splint was made in this position.



Fabricating myopathic dental splint supported by 5 mm height healing abutment and temporary crowns on temporary abutments on the teeth 1.5-1.6 and 2.5-2.6.



Selective grinding of myopathic dental splint had been performing for 14 days, and then the centric relation was determined using Aluwax wax and the myopathic dental splint.



Remounting of cast models in the articulator after 14 days if splint therapy.



Determination of the anterior guidance on incisive table on silicone index made from incisors impression.



We use Weber template to calculate the 3D position of holding cusps points and customguide plane for each tooth.

Table 8

Inlay	Right			Left		
	3 rd mm	5 th mm	10 th mm	3rd 3 mm	5 th mm	10 th mm
Straight	61°	60°	56°	65°	64°	57°
Convex	*54°	*57°	*58°	*59°	*60°	*61°
Retrusive	Black	Black	Black	Black	Black	Black

Table 9

Transversal Condylar Guidance Reference® SL

Inlay	Right			Left		
	3 rd mm	5 ^m mm	10 th mm	3 rd mm	5 th mm	10 th mm
White	*12°	*9°	*5°	22°	22°	17°
Yellow	0°	0°	0°	*14°	11°	0
Red	0°	0°	0°	4°	*1°	*0°
Blue	0°	0°	0°	0°	0°	0°

Gamma Sequence Incisal Table Condylography values used for calculationProtrusion at 5 mm: SCI 60,0° Mediotrusion right at 5 mm: SCI 62,6° TCI 10,8° Mediotrusion left at 5 mm: SCI 65,7° TCI 33.1° Suggested sequence table setting

Protrusion element: ORANGE (YELLOW)Right lateral element: BLUE Left lateral element: ORANGE (YELLOW)

Condylography values used for calculation Protrusion at 5 mm: SCI 60,9°

Mediotrusion right at 5 mm: SCI 62,6° TCI 10.8°

Mediotrusion left at 5 mm: SCI 65,7° TCI 33,1°

Calculation for incisal table setting: Sequential disocclusion according to R.SComputed using ideal anterior guidance

Table 10

	Calculated vertical cusp tip positions												
	Right Left												
	TA	I-Table	T-S1	T-S2	TA	I-Table	T-S1	T-S2					
1.	58.2°	59°	45°	67°	58.2°	59°	45°	67°					
2.	58.2°	59°	45°	67°	58.2°	59°	44°	68°					
3.	48.2°	53°			48.2°	64°							



Wax casting



After the wax-up, we decided to make dental veneers on 3.3 and 3.5 and change the inclination of palatal surfaces 1.3 and 2.3.

Protrusion

Protrusion restriction on 2 and 4 mm.



Results:

Final dental restorations.



Before / After





Conclusion

Thus, this treatment and patient diagnostic regimen with bilateral teeth abscence is necessary for the predicted long-term result. Individual parameters of sagittal joint path for the right and left sides enable fitting individual dentures for the right and left sides. Splint therapy provides for determining the centric relation.

Clinical case №3

Patient's birth date: 07.07.1966.

Date of examination: March 2009.

The patient came to the hospital complaining to unsatisfactory aesthetics, muscular aches and aching masticatory muscles.

Physical examination revealed:

- ➢ Vertical overlap.
- ➢ Diastemata.
- Decrease of the interincisal angle, non-matching midlines.
- ➢ Dental Class I.



Active and passive dental arches do not match Model casting.



Purpose of examination:

Determine the ways of applying compensation mechanism knowledge for dentoprosthetic rehabilitation in total reconstruction of dentitions. And to replace orthodontic care with orthopedic care involving aesthetic parameters planning. Assess the possibility of creating a canine guidance, anterior and retrusive control, align active and passive dental ranges of the maxilla and mandible along the sagittal and transversal planes. Use data obtained from conditioning studies, cephalometric and model analysis, combined with data from these sources with muscle palpation and wax-up data. Individual waxup parameters determined by Weber template using XYZ coordinate system to determine the location of reference cusps in Cartesian coordinate system within the articulator space.

Materials and methods:

In order to address this clinical case, we used large clinical, functional and instrumental analyses, as well as an analysis of casts mounted in the centric relation in an articulator, cephalometric and palpation studies of muscles, nerve endings, patient history collection and chronic pain detection in the maxillofacial region and the patient's body.

Important stages of treatment include splint therapy and follow-up examination of its results after 14 days. This will give a positive result in the long term. Interdisciplinary approach: involvement of an osteopathic physician provides an opportunity to relieve muscle pain and tensions in the patient's body. Psychosomatic esthetic correction contributes to the result as well.

Patient's history

revealed problems with chewing, opening the mouth wide and closing, pain in the area of the temporomandibular joints, spasms in the neck and larynx, in the head, and also posture problems.

Table 1

Der	ntal History Analysis	Valuation	yes	no
1.	Do you have problems when you chew?	2	Х	
2.	Do you have problems when you are talking?			Х
3.	Do you have problems in closing your teeth			Х
	property?			
4.	Are any of your teeth especially sensitive?		X	
5.	Do you have problem when you open your	1	X	
	mouth very wide?			
6.	Do your jaw joints make noise and if so, on			Х
	what side?			
7.	Do you have pain in the area of your jaw	1	X	
-	joints?			
8.	Do you suffer from headaches?			
9.	Do you suffer from cramps or spasm in your	1	X	
	head, neck or throat?			
10.	Do you have in general problems with your		2X**	
	posture?	1.40		
1.1	Occlusal Index	1.40		*7
11.	Have you ever had serious accident?			X
12.	Did you have one or more oral intubations?			X
13.	Have you ever had orthodontic treatment or			X
14.	Have you had a treatment with splint?		X	
15.	Are you grinding or pressing with your teeth?		X	
16.	Do you think that treatment is necessary?		X	
17.	Do you think that there is a serious disorder or	illness?		X
18.	When the last time you had dental treatment an	d what was d	lone?	

Table 2

Special Medical Analysis											
Do yo	Do you have or did ever have an illness with regard to point 1-12?										
		yes	no								
1.	Infections		Х								
2.	Cardo-vascular systems		X								
3.	Respiratory system		Х								
4.	Digestive system		Х								
5.	Metabolic system		Х								
6.	Allergies		Х								
7.	Urogenital problems		Х								
8.	Central nervous system		Х								
9.	Psychological problems (therapy)		Х								
10.	Rheumatic disease		Х								
11.	Hormonal disease		Х								
12.	Special problems		Х								
Main	concern:										

Muscle palpation revealed aches in postural muscles, closing muscles, protractor muscles, retractor muscles, medio- and laterotractors as well as changes in sublingual bone indicating swallowing function impairment.

Table 3

Muscular movement	
Posture	1, 2, 7, 12, 13, 14
Jaw-closing	3a, 3b, 4a, 4b, 5
Jaw-opening / protrusion	8, 9, 10
Retraction	3c, 8
Medio-/Laterotraction	<mark>6</mark> , 3a, 4a
Sublingual bone position	8 , 9, 10, 11, 13
Function	7, 8, 9, 10, 11, 14
POSTURE, PRORACTOR, SUB-L	LINGUAL POSITION

Thus, these mucules are tensioned.

Table 4

Mus	cle Diagnosis		Right		Left
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)	Х		Х	
4.b	M.masseter (deep)	Х		Х	
5.	Tuber maxillae	Х			Х
6.	M.pterygoideus medialis		Х		
7.	M.mylohyideus		Х		Х
8.	M.digastricus	Х		Х	
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw				
	joints*				
	a) Lateral poles, statically	X		X	
	b) Lateral poles, in rotation		Х		X
	c) Retral joint space		Х	X	
	d) Lig.temporo-mandibulare	Χ		X	



Targeted X-ray images revealed dental cavities in teeth 17, 27 root canal treatment in 16 and 26.



List of issues

- Sagittal and transverse divergence of the upper and lower dental arches.
- ➢ Incisal vertical overlap.
- ➤ Speech and aesthetics.
- ➤ Muscular aches when chewing.
- Indication for further functional instrumental analysis.

Diagnostics

- ➢ Skeletal Class I.
- ➢ Dental Class I.
- ➢ Vertical overlap.
- ➢ Muscle problems.

Treatment objectives

- \blacktriangleright Remove teeth 18 and 28.
- Increase the occlusal vertical dimension and change the depth of occlusion.
- ➢ Reshape both upper and lower dental arches.
- ≻ Change OPI and DOA.

Treatment Plan

- > Occupational oral hygiene.
- ≻ Wax-up.
- ➢ Root canal treatment.
- > Periorestorative treatment.
- Prosthodontic teeth restoration.

Condylography

Protrusion



Protrusion – retrusion and opening – closing



Reduction of movement length on the rights, i.e. quality is low and the quantity is reduced.

Left mediotrusion

Right mediotrusion



Protrusion and zero Bennet value are detected in the right joint. This is either due to disc adhesion or obstacle avoidance mechanism. Detrusion in the left joint at the right mediotrusion, but Bennet angle is positive. Normal.

Odontoprisis Bruxism



The beginning and the end of movement are not coincident. This indicates non-stable occlusion and divergence between protractor and retractor muscles.

Redetrusion, i.e. bruxism jaw, does not overlap protrusion caused by sharp slope of palatine surface of upper incisors, and the lower jaw is moved to the retrusion position with downwards shear.



Speaking movement overlaps with the first 4 mm of protrusion. Normal. Gamma rotation indicates interference in the frontal area.



Disocclusion angle calculation in the lateral area in order to calculate the chewing efficiency.



TRG, AG, DOA and OPI



Table 1

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	97.5	2B*
Facial Depth	91.5°	91.6	
Mandibular Plane	21.5°	21.1	
Facial Taper	68.0°	67.2	
Mandibular Arc	31.2°	35.5	1B*
Maxillary Position	65.0°	64.9	
Convexity	-1.0 mm	1.6	1X*
Lower Facial Height (by R. Slavicek)	42.7°	45.7	
Lower Facial Height to Point D	49.2°	49.4	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	137.9	
Upper Incisor Protrusion	4.3 mm	2.2	
Upper Incisor Inclination	23.1°	21.6	
Upper Incisor Vertical	mm	2.5	
Lower Incisor Protrusion	1.2 mm	0.0	
Lower Incisor Inclination	24.1°	20.4	
Upper Molar Position	21.0 mm	21.5	
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	3.7	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	10.7	
Distance Occlusal	40.9	32.8	
Plane – Axis (DPO)	mm		
Radius of Curve of Spee	mm	55.6	
Lip Embrasure	0.0 mm	2.7	
Occlusal Plane Xi Distance	-1.4 mm	-4.6	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	57.2	
Horizontal Condylar Inclination left	°	62.5	
Horizontal Condylar Inclination	⁰	59.8	
Relative Condylar Inclination	⁰	56.1	
Relative Condylar Inclination 6	⁰	40.9	
Relative Condylar Inclination 7	⁰	50.8	
Relative Condylar Inclination 8	⁰	36.7	
Anterior Guidance (S-AOP)	°	75.5	
Relative Anterior Guidance	⁰	71.8	
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-3.7	

Cephalometric Analysis

- Both jaws are in prognathic state, vertical size can be increased from 45.7 to 47.5.
- > Incisal pin + 4.5 mm.
- OPI is decreased must be increased to 10° for the right side and to 16° to the left side.
- Increase the angle of frontal restriction.
- Skeletal Class I
- > Asymmetric case.
- > Increase OPI by 36 and 46 to obtain $DOA = 10^{\circ}$.
- > The occlusal vertical dimension is increased.

Table	2
-------	---

Incisal Pin Table													
Incisal Pin Height	0.0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
LowerFacial Height	45.7	46.2	46.6	47.1	47.5	47.9	48.3	49.1	49.9	50.7	51.4	52.1	53.5
LFH (Norm)	42.7	42.8	42.9	43.0	43.2	43.3	43.4	43.6	43.8	44.1	44.3	44.5	44.9
LFH (Variation)	0.0	0.5	0.9	1.3	1.8	2.2	2.6	3.4	4.2	5.0	5.7	6.4	7.7
Menton Vertical	0.0	0.4	0.8	1.2	1.6	1.9	2.3	3.0	3.6	4.3	4.9	5.5	6.6
Pogorion Sagittal	0.0	-0.7	-1.4	-2.1	-2.8	-3.5	-4.2	-5.7	-7.1	-8.6	-10.0	-11.5	-14.5
IncisionInf. Vertical	0.0	0.5	0.9	1.4	1.8	2.3	2.7	3.6	4.4	5.2	6.0	6.7	8.1
Incision Inf. Sagittal	0.0	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-4.0	-5.1	-6.2	-7.3	-8.4	-10.7
Incisal Pin Height	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-20.0
LowerFacial Height	45.7	45.2	44.8	44.3	43.8	43.3	42.8	41.7	40.6	39.4	38.2	36.9	34.1

LFH (Norm)	42.7	42.6	42.5	42.4	42.2	42.1	42.0	41.8	41.5	41.3	41.1	40.8	40.4
LFH (Variation)	0.0	-0.5	-0.9	-1.4	-1.9	-2.4	-2.9	-4.0	-5.1	-6.3	-7.5	-8.8	-11.6
Menton Vertical	0.0	-0.4	-0.8	-1.3	-1.7	-2.1	-2.6	-3.5	-4.5	-5.6	-6.7	-7.8	-10.3
Pogorion Sagittal	0.0	0.7	1.4	2.0	2.7	3.4	4.0	5.3	6.6	7.8	9.0	10.1	12.3
IncisionInf. Vertical	0.0	-0.5	-1.0	-1.5	-2.0	-2.5	-3.0	-4.1	-5.2	-6.3	-7.5	-8.8	-11.4
Incision Inf. Sagittal	0.0	0.5	0.9	1.4	1.8	2.3	2.7	3.5	4.3	5.0	5.7	6.3	7.4

Articulator Settings:

- SCI $R = 57^{\circ}$
- SCI L = 63°
- OPI $R = 10^{\circ}$
- OPI $L = 16^{\circ}$
- $DOA = 17^{\circ}$
- $DOA = 17^{\circ}$
- $AG = 75^{\circ}$ too much



Gamma Sequence Incisal Table

Condylography values used for calculation Protrusion at 5 mm: SCI 63,1° Mediotrusion right at 5 mm: SCI 59,8° TCI 8,1° Mediotrusion left at 5 mm: SCI 63,9° TCI -4.3° Suggested sequence table setting. Protrusion element: ORANGE (YELLOW). Right lateral element: ORANGE (YELLOW). Left lateral element: ORANGE (YELLOW).

Condylography values used for calculation

Protrusion at 5 mm: SCI 63,1° Mediotrusion right at 5 mm: SCI 58,8° TCI 8,1° Mediotrusion left at 5 mm: SCI 63,9° TCI -4,3° Calculation for incisal table setting: Sequential disocclusion according to R.S. Computed using ideal anterior guidance. Unable to compute the right curve of Spee – cusps 3r, 6dr must be in. Unable to compute the left curve of Spee – cusps 3l, 6dl must be in. Failed to compute incisor table setting for ideal positions.

	Calculated vertical cusp tip positions										
			Righ	ıt			Lef	ť			
	TA	I-Table	T-S1	T-S2	TA	I-Table	T-S1	T-S2			
1	59.1°	60°	49°	68°	59.1°	60°	49°	68°			
2	59.1°	60°	49°	68°	59.1°	60°	49°	68°			
3	49.1°	77°			49.1°	66°					
4	36.7°	64°			36.7°	50°					
5	29.7°	58°			29.7°	41°					
6m	23.6°	50°			23.6°	31°					
6d											
7m											
7d											
8m											
8d											

Occlusal Plane Value

Unable to compute the right curve of Spee – cusps 3r, 6dr must be in.

Unable to compute the left curve of Spee – cusps 31, 6dl must be in.

Table 4

Occlusal plane adjustment for average SCI value: 63° (5 min)

Cuspal Angle	20°	25°	30°
Balanced Occlusion 1/6	43°	38°	33°
Balanced Occlusion 1/7	52°	47°	42°
Canine protected Occlusion 1/6	34°	29°	24°
Canine protected Occlusion 1/7	43°	38°	33°

Articulator settings (custom incisal table)

Coordinates of mandibular cusps are determined using Weber template and added to the table for calculating the angle for each of the teeth.

Table 5

CADIAX® Curves

	Protrusion		Medio	trusion right	Mediotrusion left		
	SI right	SCI left	SCI	TCI	SCI	TCI	
1 st	58.4°	66.5°	55.7°	6.9°	70.3°	-11.6°	
2^{nd}	63.3°	69.4°	59.5°	5.5°	69.9°	-7.4°	
3 rd	63.3°	69.3°	61.7°	7.6°	68.3°	-5.6°	

4 th	62.7°	66.9°	60.6°	7.5°	66.3°	-5.7°
5 th	60.9°	65.3°	59.8°	8.1°	63.9°	-4.3°
6 th	59.3°	63.3°	58.7°	8.4°	62.2°	-3.9°
8 th	55.5°	59.1°	55,3°	10,5°	58,2°	-2.3°
10 th		54.8°	51.6°	10.9°	54.1°	-0,5°
14^{th}						
		Retrusion				
-1.		88.7°d				
-2.		88.7°d				

Table 6

Coordinates of Cusp Tips

		F	Right		Left		
	Х	Y	Z	Х	Y	Z	
1	81.00	4.00	54.00	81.00	0.00	54.00	
2	80.00	9.00	53.50	80.00	4.00	54.00	
3	74.00	15.00	53.00	77.00	13.00	53.50	
4	64.00	20.00	53.50	71.00	19.00	53.00	
5	60.00	22.00	53.50	62.00	24.00	52.50	
6m	52.00	26.00	51.00	58.00	26.00	51.00	
6d							
7m							
7d							
8m							
8d							

Table 7

Sagittal Condylar Guidance Reference® SL

		R	light			Left
Inlay	3 rd mm	5 th mm	$10^{\text{th}} \text{ mm}$	3 rd mm	5 th mm	10^{th}mm
Straight	63°	62°		69°	67°	61°
Convex	*57°	*59°		*63°	*64°	*63°
Retrusive	Black	Black		Black	Black	Black

Table 8

Transversal Condylar Guidance Reference® SL

		F	Right			Left
Inlay	3 rd mm	5 th mm	10 th mm	3 rd mm	5 th mm	10 th mm
White	*4°	*4°	*5°	*0°	*0°	*0°
Yellow	0°	0°	0°	0°	0°	0°
Red	0°	0°	0°	0°	0°	0°
Blue	0°	0°	0°	0°	0°	0°

Remounting of casts after splint therapy for wax-up



Impressions



Finished product



Finished product mounted in the articulator. The front control of the canine guidance and the retrusion control on the first molars of the maxilla and the first premolar of the mandible are reconstructed.



Final restoration 2009



OPG (orthopantomography) 8 months after the treatment







Before/after

Before treatment



After treatment



After 9 years



Clinical case №4

Patient: age 47, sex: male.

Chief complaint: poor masticatory performance. Esthetic problems.

Inability to bite off a piece of spaghetti.

All complaints occurred after 3 orthodontic treatments and orthodontic operation.

Basic questions of the esthetic protocol:

- > What do you want to express with your smile? Answer: happiness.
- Which aspects of your personality do you want to emphasize and which ones do you want to soften?

Answer: It doesn't matter. I'm happy. I want to at spaghetti.Smile symmetry and lower lip line.

Esthetic parameter estimation in the present condition.

- Tooth shape requires correction;
- Change of teeth position;
- > Teeth size and proportions asymmetry on the right and left sides;
- > The patient wants a symmetrical smile line;
- > Photographs and casts of the previous treatment are presented in full.

Intraoral photographs:





We discovered the following:

- Sagittal and transversal dental arches don't fit together;
- Midline shift;
- ➤ Abfractions;
- > Palatal inclination of the maxilla canine teeth.

Esthetic Analysis

- ➤ Facial analysis and speech;
- Dental analysis;
- Dento-labial analysis;

Facial analysis

- Facial profile (convex, concave, normal);
- ➤ Inter-pupillary line is parallel to the incisal edge of the upper incisors;
- > Skeletal development and tooth position (buccoclination, palatal,
correct);

➤ Face proportions: lower third of the face.

Dental analysis:

- Inclination of lower incisors;
- Teeth proportions;
- Central incisors axial inclination estimation of lower incisors 11 and 21 is perpendicular to the occlusal plane (OPI);
- Depth and width central incisors overbite;
- Incisors abrasion, palatal abrasion;

Dentolabial analysis

- Inter-incisal line inclination;
- ➤ Smile line;
- Buccal corridor.

Data processing

Correlation 1:1. The desired esthetic result is achieved with a tooth proportion of 76% - 83%.

Dento-labial lines are verified.

Inter-pupillary line is parallel to the incisal edge of the maxilla central incisors. Incisal edge position of the maxilla incisors is relined according to the lower lip. Estimate of the canine position according to the alar nasalis.

Incisors profile was estimated from the profile photo. Phonetic tests: sounds Φ (F) and C (S).

The labial corridor was corrected.

Esthetic analysis



Material selection

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Esthetic settings



Basic and relative criteria for teeth evaluating

- ➢ Occlusion;
- \succ Tooth axis;
- Emergence profile topgallant;
- ➢ Gingiva level;
- Inter-proximal contact level;
- ➢ Tooth relative size;
- Tooth shape basic characteristics;
- ➢ Basic characteristics;
- Surface texture;
- ➤ Color;
- Incisal edge configuration;
- ➤ Lower lip line;
- ➤ Smile symmetry.





Table 1

Tooth	13	12	11	21	22	23
Height	11,12	8,4	10,2	10, 51	8,67	9,94
Width	7,8	6,3	7,8	8,70	6,01	6,69

Key features of tooth shape



Triangular

- ➢ Extraverted;
- Communicator;
- Enthusiast;
- ➢ Dynamic;
- ➤ Impulsive.

Oval	Triangular	Square cut	Square
Centralincisors are dominated	Smile upline	Central incisors are dominated	Absence of domination
Round cusps	Divergent tooth axes	Flat incisal edge	Axes divergence
Lateral mandibular incisors are poorly pronounced	Cusps inclination	Aggressive cusps	Horizontal line of incisors cutting edge and canines
Round dental arch		Vertical axes	



Table 3

Melancholic	Optimistic	Choleric	Phlegmatic
Sensible	Dynamic	Strong	Calm
Oval	Triangular	Square cut	Square
Organized	Extravert	Certain	Diplomatic
Perfectionist	Sociable	Objective	Peaceful
Artistic	Enthusiastic	Explosive	Secretive
Abstracted	Dynamic	Strained	Spiritual
Shy	Impulsive	Keeper	Conformist
Modest		Sharp-tempered	Prudent

Selection of teeth

- ➢ Even or crowded;
- Age: young, middle age, old;
- Form: oval, triangle, four-square, square cut;
- Texture: macro, micro, missing;
- ≻ Color.

Esthetics and Functions

- ➢ Esthetics evaluation;
- Tooth 21-11 is visible at 1 mm in a relaxed state;
- \succ The lower incisor is visible at 3 mm.

Functional evaluation

- \blacktriangleright Central incisor depth overbite = 1 mm;
- \succ Central incisor width overbite = 1 mm;
- > Anterior guidance = 0 mm;
- \blacktriangleright Vertical dimension = 19,32;
- ➢ Centric relation.

Table 4

Phonetics evaluation of sounds F and S

Clinical functional analysis

Den	tal History		Valuat	ion	Yes	No			
1.	Do you ha	ave problen	ns when you	u chew?		1		Х	
2.	Do you ha	ave problen	ns when you	u are talkin	g?	1		Х	
3.	Do you ha	ave problen	ns in closing	g your teeth	1				Х
	property?								
4.	Are any o	f your teeth	especially	sensitive?					Х
5.	Do you ha	ave problen	n when you	open your	mouth	1		X	
	very wide?								
6.	Do your j	aw joints m	ake noise a	nd if so, or	what	1		Х	
	side?								
7.	Do you have pain in the area of your jaw joints?								Х
8.	Do you suffer from headaches?								Х
9.	Do you suffer from cramps or spasm in your head, 1						Х		
	neck or throat?								
10.	Do you have in general problems with yourposture?						Х		
	Occlusal Index 1.00								
11.	Have you	ever had se	erious accid	ent?					Х
12.	Did you h	ave one or	more oral i	ntubations?					X
13.	Have you	ever had or	rthodontic t	reatment of	••••			X	
14.	Have you	had a treat	ment with s	plint?				Х	
15.	Are you g	rinding or p	pressing with	th your teet	h?			X	
16.	Do you th	ink that tre	atment is no	ecessary?				Х	
17.	Do you th	ink that the	ere is a serio	ous disorder	or illnes	s?			Х
18.	When the last time you had dental treatment and what was done?								
	How wou	ld you desc	ribe your p	sychic beha	avior?				
19.	happy	sad	calm	excited	self-con	trolled	1	ack of	self-
								contr	ol
			Х						

Special Medical Analysis						
Do yo	Do you have or did ever have an illness with regard to point 1-12?					
		yes	no			
1.	Infections		Х			
2.	Cardo-vascular systems		Х			
3.	Respiratory system		Х			
4.	Digestive system		Х			
5.	Metabolic system		Х			
6.	Allergies		Х			
7.	Urogenital problems		Х			
8.	Central nervous system		Х			
9.	Psychological problems (therapy)		Х			
10.	Rheumatic disease		Х			
11.	Hormonal disease		Х			
12.	Special problems		Х			
Main concern: problem with biting spaghetti by incisor, speech, chewing, during last						
year f	irst contact point changed					

Muscles analysis

Mus	scle Diagnosis		Right	Left		
	0	+	++	+	++	
1.	Shoulders and neck					
2.	Atlanto-occipital region					
3.a	M.temporalis ant.					
3.b	M.temporalis med.					
3.c	M.temporalis post.					
4.a	M.masseter (superficial)					
4.b	M.masseter (deep)					
5.	Tuber maxillae	Х		Х		
6.	M.pterygoideus medialis					
7.	M.mylohyideus			Х		
8.	M.digastricus	Х				
9.	Suprahyoidale M.					
10.	Infrahyoidale M.					
11.	Larynx					
12.	M.sterno-cleido-mastoideus					
13.	M.omohyoideus					
14.	Tongue					
15.	Comparative palpation of jaw joints					
	a) Lateral poles, statically					
	b) Lateral poles, in rotation	Х		Х		
	c) Retral joint space		X		X	
	d) Lig.temporo-mandibulare	Х			Х	

Table 7

Posture	1,2, 7, 12, 13, 14			
Jaw-closing	3a, 3b, 4a, 4b, <mark>5</mark>			
Jaw-opening / protrusion	8, 9, 10			
Retraction	3c, 8			
Medio-/Laterotraction	6, 3a, 4a			
Sublingual bone position	8, 9,10,11,13			
Function	7, <mark>8,</mark> 9, 10, 11, 14			
POSTURE, PRORACTOR, SUB-LINGUAL POSITION				

Cybernetic system of the masticating organ



Panoramic radiograph and cone-beam computerized tomography



List of issues

- > Dental arches on sagittal and transversal planes don't fit together;
- Absence of front restriction and canine guidance;
- Difficulties with speaking;
- Difficulties with chewing;
- Difficulties with esthetics.

Diagnosis

- Arthrosis in the TMJ on both sides;
- > Total ventral disc dislocation of the TMJ on both sides;

- Dental Class I. After orthodontic treatment;
- Occlusion: cusp to cusp in the frontal area.

Table 8

Load vector	Cranial/ventrocranial
Symptom	No pain and free movement restrictions
	Crepitation
Clinical diagnostics	No pain in TMJ even on activity
	Condyle palpation detects crepitation
	Crepitation increases during motion palpation
Instrumental analysis	Condylography

Table 9

X-ray diagnostics	Panoramic radiograph, MRI
Treatment	Caudal relocation in the relaxed state, decompression

Treatment objectives

- \triangleright Remove tooth 18;
- Providing support in posterior area of teeth;
- Canine guidance and anterior restriction;
- Matching dental curves on sagittal and transversal planes;
- Change the occlusal plane and the angle of disocclusion.

Treatment Plan

1. Clinical instrumental and functional analysis;

- 2. Splint therapy for decompression, relaxation, and distraction to place the condylar disc in a physiological position, and for remodulation of the condyle.
- 3. Remounting in the new therapeutic position.
- 4. Wax-up.
- 5. Long-term temporary crowns.
- 6. Additional condylography, cephalometric analysis, cone-beam CT, panoramic radiograph.
- 7. Final dental restorations.

Initial condylography

Protrusion-retrusion



Right mediotrusion

Left mediotrusion







TMJ protrusion

Bruxism



Redetrusion and compression in bothTMJs



Mastication



Speech in compression in both TMJ

Motion restrictions duringmastication

Cephalometric Analysis



Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial. The skeletal trend of the mandible is unknown Skeletal class is extremely II.

The maxilla is positioned extremely prognathic. The mandible is positioned extremely prognathic Lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is increased.

The inclination of the upper incisor is strongly increased. The protrusion of the lower incisor is increased.

The inclination of the lower incisor is normal. The interincisal angle is diminished.

Occlusal concept: Group function No functional statement available.

Explanation

Deteminants Norm Value Trend 90.0° 5B***> 106.6 Facial Axis Facial Depth 91.5° 92.1 2D** 68.0° 57.8 Facial Taper Mandibular Plane 21.5° 2D** 30.0 **Related Values** Norm Value Trend **Bjoerk Sum** 396.0° 372.2 9-***> 7+***> Facial Lenghth Ratio 63.5% 77.8 67.0° 8-***> Y Axis to S N 40.9 1-* Y Axis (Downs) 61.8° 58.2 S N to Gonion Gnathion Angle 31.6° 12.2 5-***>

Analysis

Slavicek Analysis						
Skeletal Measurement	Norm	Value	Trend			
Facial Axis	90.0°	106.6	5B***>			
Facial Depth	91.5°	92.1				
Mandibular Plane	21.5°	30.0	2D**			
Facial Taper	68.0°	57.8	2D**			
Mandibular Arc	31.2°					
Maxillary Position	65.0°	109.7	17-***>			
Convexity	-1.0 mm	4.4	2X**			
Lower Facial Height (by R. Slavicek)	42.7°	40.4				
Lower Facial Height to Point D	49.2°	45.9				
Dental Measurement	Norm	Value	Trend			
Interincisal Angle	132.8°	113.4	1-*			
Upper Incisor Protrusion	4.3 mm	7.5	1+*			
Upper Incisor Inclination	23.1°	36.3	2+**			
Upper Incisor Vertical	mm	0.2				
Lower Incisor Protrusion	1.2 mm	4.9	1+*			
Lower Incisor Inclination	24.1°	30.2				
Upper Molar Position	21.0 mm	28.7	3+***			
Occlusal Plane	Norm	Value	Trend			
Occlusal Plane – Axis Orbital Plane (Slavicek)		7.4				
Idealized Occlusal Plane – Axis Orbital Plane	⁰	15.8				
Distance Occlusal Plane – Axis (DPO)	40.9 mm	37.4				
Radius of Curve of Spee	mm	78.1				
Lip Embrasure	0.0 mm	-0.6				
Occlusal Plane Xi Distance	-1.4 mm	-11.6				
Functional Measurement	Norm	Value	Trend			
Horizontal Condylar Inclination right	⁰	41.8				
Horizontal Condylar Inclination left	⁰	48.8				
Horizontal Condylar Inclination	⁰	45.3				
Relative Condylar Inclination	⁰	37.8				
Relative Condylar Inclination 6	⁰	33.7				
Relative Condylar Inclination 7	⁰	36.2				
Relative Condylar Inclination 8	⁰	45.3				
Anterior Guidance (S-AOP)	0					
Relative Anterior Guidance	0					
Esthetic Measurement (Lip Relation)	Norm_	Value	Trend			
Esthetic Plane	-2.9 mm	0.0	1+*			

Asymmetric case SCI R = 42° SCI L = 49° OPI R = 6° OPI L = 4° DOA R = 6° DOA L = 15°

Change OPI R to 2° Change OPI L to 8°

The occlusal plane changed for disocclusal angle correction.



Casts in RP

No lateral support for teeth; No canine and front guidances; Tooth 18: no antagonist.

Attrition facets of stamp cusps; Absence of tooth 46;

Removing 15 on previous orthodontic treatment;

The patient refused repeated orthodontic treatment and orthodontic surgery.















Functional settings

SCI R = 42° black insert; SCI L = 48° black insert; Bennet insert R = 2°; white insert Bennet insert L = 7°; yellow insert OPIR = 2°; OPIL = 8°; AG = 52° right side; 58° left side Dental class I. Increasing lower face height + 3 mm with an incisal pin.

The space between the central incisors was closed by maxillary teeth.

Articulator Settings



Wax-up



Computer wax-up simulation





Long-term temporaries



Panoramic radiograph and cone-beam computerized tomography



Final restorations as of October, 2017, and the final condylography



Analysis

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is extremely dolichofacial Skeletal class is II with tends to I.

The maxilla is positioned prognathic.

The mandible is positioned neutral, with tendency to prognatic The lower facial height is diminished.

Dental class unknown. The protrusion of the upper incisor is normal. The inclination of the upper incisor is strongly increased.

The protrusion of the lower incisor is increased. The inclination of the lower incisor is normal. The interincisal angle is diminished. Occlusal concept: Group function.

Explanation

			
Deteminants	Norm	Value	Trend
Facial Axis	90.0°	91.9	
Facial Depth	91.5°	93.2	
Facial Taper	68.0°	62.5	1D*
Mandibular Plane	21.5°	24.1	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	372.2	
Facial Lenghth Ratio	63.5%	58.1	2-**
Y Axis to S N	67.0°	65.5	
Y Axis (Downs)	61.8°	52.6	3-***
S N to Gonion Gnathion Angle	31.6°	37.3	1+*

Table 12

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	91.9	
Facial Depth	91.5°	93.2	
Mandibular Plane	21.5°	24.1	
Facial Taper	68.0°	62.5	1D*
Mandibular Arc	31.2°	9.1	5D***>
Maxillary Position	65.0°	69.4	1 - + *
Convexity	-1.0 mm	3.2	2X**
Lower Facial Height (by R. Slavicek)	42.6°	36.3	1-*
Lower Facial Height to Point D	50.3°	39.7	1-*
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	111.1	1-*
Upper Incisor Protrusion	4.3 mm	7.5	
Upper Incisor Inclination	23.1°	37.9	2+**
Upper Incisor Vertical	mm	0.2	
Lower Incisor Protrusion	1.2 mm	4.1	1+*
Lower Incisor Inclination	24.1°	30.8	
Upper Molar Position	21.0 mm	30.5	4+***>

Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	°	7.9	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	22.1	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	34.0	
Radius of Curve of Spee	mm	73.8	
Lip Embrasure	0.0 mm	0.1	
Occlusal Plane Xi Distance	-1.4 mm	-19.5	4-***>
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	44.9	
Horizontal Condylar Inclination left	⁰	49.2	
Horizontal Condylar Inclination	⁰	47.1	
Relative Condylar Inclination	⁰	39.1	
Relative Condylar Inclination 6	⁰	34.8	
Relative Condylar Inclination 7	⁰	36.6	
Relative Condylar Inclination 8	⁰		
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-1.1	

Final RP result





Final dental restoration



Clinical case №5

Patient's birth date: 23/04/1949

Date of examination: 2009

Patient visited the medical center with complaints of mastication dysfunction and an esthetic defect. He was unable to bite in one position, had troubles with opening the mouth wide and posture problems.

Medical history included cardiovascular disease and high blood pressure.

Muscles palpation detected activity of m.mylohyoideus, m.pterygoideus medialis on both sides and in the area of TMJ, lateral poles in rotation, lig.temporomanolibulare. These muscles are responsible for protrusion, interference avoidance mechanisms and temporomandibular joint location.

Medical analysis

Special Medical Analysis						
Do yo	Do you have or did ever have an illness with regard to point 1-12?					
		Yes	No			
1.	Infections		Х			
2.	Cardo-vascular systems (высокое давление)		Х			
3.	Respiratory system		Х			
4.	Digestive system		Х			
5.	Metabolic system		Х			
6.	Allergies		Х			
7.	Urogenital problems		Х			
8.	Central nervous system		Х			
9.	Psychological problems (therapy)		Х			
10.	Rheumatic disease		Х			
11.	Hormonal disease		Х			
12.	Special problems		Х			
Main	Main concern: нарушение функции жевания					

Table 2

Der	ntal Histo	ry Analys	is			Valuat	ion	Yes	No
1.	Do you ha	ve problems	when you c	hew?		2		Х	
2.	Do you ha	ve problems	when you a	re talking?					Х
3.	Do you ha	ve problems	in closing y	our teethpro	operty?	2		Х	
4.	Are any of (45 impro	your teeth e ved mastica	especially set tory perfor	nsitive? mance)		2		Х	
5.	5. Do you have problem when you open your mouth very wide?				2		Х		
6.	Do your ja side?	w joints ma	ke noise and	if so, on w	hat				Х
7.	Do you ha	ve pain in th	e area of you	ur jaw joint	s?				Х
8.	Do you sut	ffer from he	adaches?						Х
9.	Do you suffer from cramps or spasm in your head, neck or throat?						Х		
10.	Do you have in general problems with your1posture?					Х			
				Occlusa	l Index	1.80)		
11.	Have you	ever had ser	ious acciden	t?					Х
12.	Did you ha	ave one or m	ore oral intu	ubations?					Х
13.	Have you	ever had orth	nodontic trea	atment or	•				Х
14.	Have you	had a treatm	ent with spli	nt?					Х
15.	Are you gr	rinding or pr	essing with	your teeth?				X	
16.	Do you thi	nk that treat	ment is nece	essary?					
17.	Do you thi	nk that there	e is a serious	disorder or	illness	?			
18.	When the	last time you	1 had dental	treatment a	nd what	t was done'	?		
	How woul	d you descri	be your psyc	chic behavio	or?		1		
19.	happy	sad	calm	excited	self-c	ontrolled		lack of <u>con</u> tr	self-

Muscles palpation and chronic pain

Muscle Diagnosis		Right		Left	
	0	+	++	+	++
1.	Shoulders and neck			Х	
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae				
6.	M.pterygoideus medialis	Х		Х	
7.	M.mylohyideus		X		X

8.	M.digastricus			
9.	Suprahyoidale M.			
10.	Infrahyoidale M.			
11.	Larynx			
12.	M.sterno-cleido-mastoideus			
13.	M.omohyoideus			
14.	Tongue			
15.	Comparative palpation of jaw joints			
	a) Lateral poles, statically			
	b) Lateral poles, in rotation	Х	Х	
	c) Retral joint space			
	d) Lig.temporo-mandibulare		Х	



Intraoral photographs



- \succ Absence of support in the posterior teeth.
- Mandibular teeth over-crowding;
- Absence of reproducible centric occlusion;
- ➤ Wedge-shaped defect on the canines and premolars of the mandible.
- Emergence profile recession on the incisors and molars of the mandible;
- Absence of canine and anterior guidance.

Casts mounted into in the articulator with kinematic axis in the centric relation



Panoramic radiograph before dental implant placement



Lateral teleradiography



List of issues

- 1. Maxillary and mandibular dental arches in sagittal and transversal planes don't fit together.
- 2. Absence of occlusal plane
- 3. Muscle pain.
- 4. Absence of teeth in the maxilla.

Condylography



Shift to the right after 1 mm protrusion and deviation are due to muscle problems.

Shift to the left and the position of protrusion above retrusion are due to protractors activity.



Negative Bennett angle, midline deviation of the disc.

Condylography



The mandible is cranially shifted at bruxism, implying compression in the temporomandibular joint.



Speech on the protrusion path is a good situation.

According to condylography data: compression in both TMJ during bruxism, dental dam retractors activity and shift of the disc in left TMJ under left mediotrusion.

Cephalometric analysis

Asymmetric case SCI R = 44°; SCI L = 51°; OPI = 20° on both sides; DOA R = -6°; DOA L = 1°; Change right general OPI = 8°; OPI R =4° (occlusal plane for the tooth 46); OPI L = 10°; left OPI6 = 10° (occlusal plane for the tooth 36); DOA for both sides = 10°.

LFH (Lower face height) is normal. The maxilla is in a neutral position, the mandible is in retrognathic position with a tendency to neutral. We are planning to increase lower facial height by + 2 mm for creating occlusal contacts and increasing the incisor angle. Dental Class I.

Table	4
-------	---

Slavicek Analysis					
Skeletal Measurement	Norm	Value	Trend		
Facial Axis	90.0°	94.6	1 B *		
Facial Depth	89.0°	85.4	1-*		
Mandibular Plane	24.0°	24.9			
Facial Taper	68.0°	69.5			

Mandibular Arc	29.0°		
Maxillary Position	65.0°	63.0	
Convexity	0.0 mm	4.4	2X**
Lower Facial Height (by R. Slavicek)	44.1°	45.3	
Lower Facial Height to Point D	50.6°	49.1	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.3°	116.3	1-*
Upper Incisor Protrusion	5.6 mm	5.5	
Upper Incisor Inclination	26.4°	29.0	
Upper Incisor Vertical	mm	-0.2	
Lower Incisor Protrusion	0.9 mm	2.7	1+*
Lower Incisor Inclination	22.3°	34.6	
Upper Molar Position	18.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	20.9	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	10.7	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	19.5	2-**
Radius of Curve of Spee	mm	121.7	
Lip Embrasure	0.0 mm	-0.4	
Occlusal Plane Xi Distance	-1.4 mm	11.1	3+***
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	44.3	
Horizontal Condylar Inclination left	⁰	51.1	
Horizontal Condylar Inclination	⁰	47.7	
Relative Condylar Inclination	⁰	26.8	
Relative Condylar Inclination 6	⁰	26.2	
Relative Condylar Inclination 7	⁰	21.4	
Relative Condylar Inclination 8	⁰	47.7	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.3 mm	-3.1	

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is unknown.

The skeletal trend of the mandible is extremely dolichofacial Skeletal class

is II with tends to I.

The maxilla is positioned neutral.

The mandible is positioned retrognathic, with tendency to neutral. Lower

facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is normal The inclination of the upper incisor is normal The protrusion of the lower incisor is normal The inclination of the lower incisor is increased The interincisal angle is diminished.

Occlusal concept: Unknown (data missing) No functional statement available.

Explanation

Deteminants	Norm	Value	Trend
Facial Axis	90.0°	94.6	1B*
Facial Depth	89.5°	85.4	1-*
Facial Taper	68.0°	69.5	
Mandibular Plane	24.0°	24.9	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	392.0	1-*
Facial Lenghth Ratio	63.5%	65.8	1+*
Y Axis to S N	67.0°	71.1	1+*
Y Axis (Downs)	61.2°	61.1	
S N to Gonion Gnathion Angle	32.6°	32.0	


Cephalometric analysis and calculation of the disocclusal angle

Incisal Pi	n Tal	ble											
Incisal Pin Height	0.0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
Lower Facial Height	45.3	45.8	46.2	46.6	47.0	47.4	47.8	48.6	49.4	50.1	50.8	51.5	52.9
LFH (Norm)	44.1	44.2	44.3	44.4	44.5	44.6	44.8	45.0	45.2	45.4	45.6	45.9	46.3
LFH (Variation)	-0.0	0.4	0.9	1.3	1.7	2.1	2.5	3.3	4.0	4.8	5.4	6.1	7.4
Menton Vertical	0.0	0.5	0.9	1.4	1.8	2.2	2.6	3.4	4.2	4.9	5.6	6.3	7.6
Pogorion Sagittal	0.0	-0.7	-1.5	-2.3	-3.0	-3.8	-4.5	-6.1	-7.6	-9.2	-10.8	-12.4	-15.5
IncisionInf. Vertical	0.0	0.6	1.1	1.7	2.2	2.7	3.3	4.3	5.3	6.2	7.2	8.1	9.8
IncisionInf. Sagittal	0.0	-0.5	-1.1	-1.6	-2.2	-2.7	-3.3	-4.5	-5.6	-6.8	-8.1	-9.3	-11.8
	I							I					
Incisal Pin Height		-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-20.0
Lower Facial Height	45.3	44.9	44.4	43.9	43.5	43.0	42.5	41.4	40.3	39.1	37.9	36.6	33.8
LFH (Norm)	44.1	44.0	43.8	43.7	43.6	43.5	43.4	43.2	42.9	42.7	42.4	42.2	41.7
LFH (Variation)	-0.0	-0.5	-0.9	-1.4	-1.9	-2.4	-2.9	-3.9	-5.0	-6.2	-7.4	-8.7	-11.5
Menton Vertical	0.0	-0.5	-1.0	-1.4	-1.9	-2.5	-3.0	-4.1	-5.2	-6.4	-7.7	-9.0	-11.8
Pogorion Sagittal	0.0	0.7	1.5	2.2	2.9	3.7	4.4	5.8	7.1	8.5	9.8	11.0	13.4
IncisionInf. Vertical	0.0	-0.6	-1.2	-1.8	-2.4	-3.0	-3.6	-4.9	-6.2	-7.6	-9.0	-10.5	-13.7
IncisionInf. Sagittal	0.0	0.5	1.0	1.6	2.1	2.5	3.0	4.0	4.8	5.7	6.5	7.2	8.4

Increased occlusal vertical dimension

Dental Class I Muscle tension Loose ligaments.

Visualization of the treatment plan

Lower facial height will be increased by + 2 mm with an incisal pin. The occlusal planeadjusts for 36 to 6.5°



Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	93.8	1B*
Facial Depth	89.0°	84.9	1-*
Mandibular Plane	24.0°	26.7	
Facial Taper	68.0°	69.3	
Mandibular Arc	29.0°		
Maxillary Position	65.0°	63.0	
Convexity	0.0 mm	5.5	2X**
Lower Facial Height (by R. Slavicek)	44.4°	46.1	
Lower Facial Height to Point D	50.9°	49.9	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.3°	115.5	1-*
Upper Incisor Protrusion	5.6 mm	5.8	
Upper Incisor Inclination	26.4°	29.9	
Upper Incisor Vertical	mm	-0.5	
Lower Incisor Protrusion	0.9 mm	2.6	
Lower Incisor Inclination	22.3°	34.5	1+*
Upper Molar Position	18.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	6.6	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	10.5	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	41.3	
Radius of Curve of Spee	mm	56.1	
Lip Embrasure	0.0 mm	0.2	
Occlusal Plane Xi Distance	-1.4 mm	-4.2	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	°	44.3	
Horizontal Condylar Inclination left	°	51.1	

Horizontal Condylar Inclination	⁰	47.7	
Relative Condylar Inclination	⁰	41.1	
Relative Condylar Inclination 6	⁰	25.5	
Relative Condylar Inclination 7	⁰	20.7	
Relative Condylar Inclination 8	⁰	47.7	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.3 mm	-3.1	

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is unknown.

The skeletal trend of the mandible is extremely dolichofacial Skeletal class is II.

The maxilla is positioned neutral. The mandible is positioned retrognathic Lower facial height is normal. Dental class unknown.

The protrusion of the upper incisor is normal. The inclination of the upper incisor is normal. The protrusion of the lower incisor is normal. The inclination of the lower incisor is increased. The interincisal angle is diminished.

Occlusal concept: Unknown (data missing). No functional statement available.

Explanation

Determinants	Norm	Value	Trend
Facial Axis	90.0°	93.8	1B*
Facial Depth	89.5°	84.9	1-*
Facial Taper	68.0°	69.3	
Mandibular Plane	24.0°	25.7	
Related Values	Norm	Value	Trend
D : 1.0			
Bjoerk Sum	396.0°	392.0	1-*
Facial Lenghth Ratio	396.0° 63.5%	392.0 65.4	1-*
Facial Lenghth Ratio Y Axis to S N	396.0° 63.5% 67.0°	392.0 65.4 71.7	1-* 1+*
Bjoerk Sum Facial Lenghth Ratio Y Axis to S N Y Axis (Downs)	396.0° 63.5% 67.0° 61.2°	392.0 65.4 71.7 61.7	1-* 1+*

VTO on the right (Visualization of the treatment plan)

Lower facial height will be increased by + 2 mm with an incisal pin. The occlusal plane on the left =10°



After the splint therapy and osteopathic manipulative treatment, palpation of joints was repeated and the centric relation was changed. Results of the performed condylography and cephalometric evaluation and dental wax-up were submitted to the dental technical laboratory.

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	93.7	1B*
Facial Depth	89.0°	84.8	1-*
Mandibular Plane	24.0°	26.8	
Facial Taper	68.0°	69.2	
Mandibular Arc	29.0°		
Maxillary Position	65.0°	63.0	
Convexity	0.0 mm	5.5	2X**
Lower Facial Height (by R. Slavicek)	44.4°	46.2	
Lower Facial Height to Point D	50.9°	50.0	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.3°	115.5	1-*
Upper Incisor Protrusion	5.6 mm	5.9	
Upper Incisor Inclination	26.4°	30.0	
Upper Incisor Vertical	mm	-0.8	
Lower Incisor Protrusion	0.9 mm	2.6	
Lower Incisor Inclination	22.3°	34.4	1+*
Upper Molar Position	18.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	10.0	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	10.5	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	36.7	
Radius of Curve of Spee	mm	62.5	
Lip Embrasure	0.0 mm	-0.2	

Table	8
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Occlusal Plane Xi Distance	-1.4 mm	-0.8	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	44.3	
Horizontal Condylar Inclination left	⁰	51.1	
Horizontal Condylar Inclination	⁰	47.7	
Relative Condylar Inclination	⁰	37.7	
Relative Condylar Inclination 6	°	25.4	
Relative Condylar Inclination 7	⁰	20.6	
Relative Condylar Inclination 8	⁰	47.7	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.3 mm	-3.1	

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is unknown.

The skeletal trend of the mandible is extremely dolichofacial Skeletal class is II.

The maxilla is positioned neutral.

The mandible is positioned retrognathic Lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is normal. The inclination of the upper incisor is normal. The protrusion of the lower incisor is normal. The inclination of the lower incisor is increased. The interincisal angle is diminished.

Occlusal concept: Unknown (data missing). No functional statement available.

Explanation

Deteminants	Norm	Value	Trend
Facial Axis	90.0°	93.7	1 B *
Facial Depth	89.5°	84.	1-*
Facial Taper	68.0°	69.2	
Mandibular Plane	24.0°	25.8	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	392.9	1-*
Facial Lenghth Ratio	63.5%	65.3	

Y Axis to S N	67.0°	71.8	1+*
Y Axis (Downs)	61.2°	61.8	
S N to Gonion Gnathion Angle	32.6°	32.9	

Technical Assignment for Wax-up

- ▶ Incisal pin = +2 mm.
- > Occlusal plane = 6.5° on the right and = 10° on the left.
- → Occlusal plane OPI $36 = 10^\circ$, OPI $46 = 4^\circ$.
- In the anterior dental group, when the vertical dimension of occlusion is increased we are filling the GAP by increasing the palatal surface of the crowns in the central incisor of the maxilla.
- Asymmetric case SCI R44 $^{\circ}$ (blue insert), SCI L = 51 $^{\circ}$ (black insert).
- Right Bennett angle = 14° degrees (white insert), left 0° (white insert).
- ➢ Dental Class I.

Articulator settings



Treatment Plan

- 1. Splint therapy and osteopathic manipulative treatment.
- 2. Repeated joint palpation and centric relation.
- 3. Wax-UP.
- 4. Long-term temporary crowns in the centric relation.
- 5. Surgical correction of the emergence profile correction of the gingiva in 4 weeks after setting the abutments.
- 6. After casting wax, 21 and 24 are created.
- 7. Tooth preparation for long-term temporary crowns.
- 8. Long-term temporary crowns.
- 9. Definitive impressions for the final restorations.
- 10. Producing the restorations.

Remounting of the models after splint therapy and a casting wax



















Final dental restorations



Clinical case №6

Patient's birth date: 04/04/1976

Date of examination: 08/09/2010

The patient applied to the medical center with complaints of poor esthetic and masticatory performance.

Physical examination revealed:

- There is a defect observed in the maxilla and mandible because of the lack of support in the posterior area;
- ➤ The central lines mismatch;
- Deep overbite;
- Chipping of the ceramic veneer of porcelain jacket crown on the tooth 24.



The patient's dental history was investigated. General medical analysis did not reveal any diseases.

Enlargement X-ray



Panoramic Radiography



Thus, dental history and physical examination revealed the following problems:

- ➤ Lack of support in the posterior areas of the maxilla and mandible;
- Difficulties with chewing;
- ➢ Midline shifted;
- Esthetic problems;
- Deep overbite;

Treatment Plan

- Getting the impressions to produce a post and core on 36, 35, 37, 45, 47.
- 2. Condylography.

- 3. Mounting the maxilla casts according to the individual mandibular axis.
- 4. Cephalometric analysis.
- 5. Determining the centric relation.
- 6. Mounting the mandible model in the articulator.
- 7. Removal of the tooth 24.
- Crowns for 14, 13, 12, 11, 21, 22, 34, 35, 36, 37, 32, 31, 41, 42, 43, 44, 45, 47.
- 9. Crowns for custom abutments 17-16-15, 25-26-27, 33, 46.
- Long-term temporary crowns for teeth 23-24 and an implant for tooth 23.
- 11. Manufacturing final restorations.

Condylography after splint therapy





Right mediotrusion

Left mediotrusion

Opening/closing



There is a negative Bennett angle in the right mediotrusion implying there is a pattern of avoiding an obstacle either in the joint structure or in the occlusion area. For the following analysis the cast models and MRI analysis of the TMJ will be used.

Also, the retrusion is noted in the left joint.

When left mediotrusion occurs, a protrusive component in the right joint is noted.

Bruxism- opening- closing

Overlay plots opening/closing -protrusion-retroversion



At bruxism, the mandible moves posteriorly and cranially, causing compression of the bilaminar zone which results in pain in the TMJ.

Unobstructed movement

Speaking – protrusion



There is a compression in the left TMJ and distraction in right TMJ when speaking. It is the result of the absence in the posterior areas.

Teleradiography (TRG) in frontal and lateral projection



Cephalometric Analysis

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is brachyfacial Skeletal class is I. The maxilla is positioned strongly prognathic.

The mandible is positioned stark prognathic. The lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is normal. The inclination of the upper incisor is normal. The protrusion of the lower incisor is normal. The inclination of the lower incisor is normal. The interincisal angle is normal Occlusal concept: Unknown (data missing). No functional statement available.

Explanation

	Determinants	Norm	Value	Trend
Facial Axis		90.0°	91.8	
Facial Depth		89.0°	86.1	
Facial Taper		68.0°	65.7	

Mandibular Plane	24.0°	28.0	1D*
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	383.2	5-***
Facial Lenghth Ratio	63.5%	72.6	4+***
Y Axis to S N	67.0°	61.2	1-*
Y Axis (Downs)	61.2°	64.3	1+*
S N to Gonion Gnathion Angle	32.6°	23.2	2-**



Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	91.7	
Facial Depth	89.0°	90.1	
Mandibular Plane	24.0°	22.8	
Facial Taper	68.0°	66.9	
Mandibular Arc	29.0°	48.3	4B***>
Maxillary Position	65.0°	69.0	1+*
Convexity	0.0 mm	-0.4	
Lower Facial Height (by R. Slavicek)	44.2°	44.8	
Lower Facial Height to Point D	50.7°	48.9	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	131.5	
Upper Incisor Protrusion	4.3 mm	3.8	
Upper Incisor Inclination	23.1°	18.4	
Upper Incisor Vertical	mm	3.6	
Lower Incisor Protrusion	1.2 mm	-0.6	
Lower Incisor Inclination	24.1°	30.0	
Upper Molar Position	18.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	°	12.8	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	12.0	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	30.8	1-*
Radius of Curve of Spee	mm	82.7	
Lip Embrasure	0.0 mm	1.4	
Occlusal Plane Xi Distance	-1.4 mm	2.5	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	°	51.7	
Horizontal Condylar Inclination left	°	55.1	
Horizontal Condylar Inclination	⁰	53.5	

Relative Condylar Inclination	⁰	40.5	
Relative Condylar Inclination 6	°	24.5	
Relative Condylar Inclination 7	°	53.4	
Relative Condylar Inclination 8	⁰	53.4	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.3 mm	-4.7	1-*

Lower face height is normal. The occlusal plane $=16^{\circ}$. The lip seal line corresponds to the central incisor point.

The structural point for tracing the distal slope of 46 and 36 was determined by OPI.

Incisal Pin Table													
Incisal Pin Height	0.0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
Lower Facial Height	45.4	45.8	46.2	46.6	47.1	47.5	48.6	49.1	49.4	50.1	50.8	51.5	52.9
LFH (Norm)	45.2	45.3	45.4	45.5	45.6	45.7	45.8	46.0	46.2	46.4	46.6	46.8	47.2
LFH (Variation)	0.0	0.4	0.9	1.3	1.7	2.1	2.5	3.3	4.0	4.8	5.5	6.2	7.5
Menton Vertical	0.0	0.4	0.9	1.3	1.7	2.1	2.5	3.2	4.0	4.6	5.3	5.9	7.1
Pogorion Sagittal	0.0	-0.8	-1.6	-2.3	-3.1	-3.9	-4.7	-6.3	-7.9	-9.5	-11.1	-12.8	-16.0
IncisionInf. Vertical	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.9	4.8	5.6	6.5	7.3	8.8
Incision Inf. Sagittal	0.0	-0.5	-1.1	-1.6	-2.2	-2.8	-3.3	-4.5	-5.7	-6.8	-8.1	-9.3	-11.8
Incisal Pin Height	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-20.0
Lower Facial Height	45.4	44.9	44.5	44.0	43.5	43.0	42.5	41.5	40.5	39.4	38.2	37.0	34.4
LFH (Norm)	45.2	45.1	45.0	44.9	44.8	44.7	44.6	44.4	44.2	44.0	43.8	43.6	43.1
LFH (Variation)	0.0	-0.4	-0.9	-1.4	-1.8	-2.3	-2.8	-3.8	-4.9	-6.0	-7.1	-8.3	-10.9

Menton Vertical	0.0	-0.4	-0.9	-1.4	-1.9	-2.3	-2.9	-3.9	-5.0	-6.1	-7.3	-8.6	-11.3
Pogorion Sagittal	0.0	0.8	1.5	2.3	3.0	3.8	4.5	6.0	7.4	8.8	10.2	11.5	14.0
IncisionInf. Vertical	0.0	-0.5	-1.1	-1.6	-2.1	-2.7	-3.3	-4.4	-5.7	-6.9	-8.2	-9.6	-12.5
Incision Inf. Sagittal	0.0	0.5	1.1	1.6	2.1	2.6	3.0	4.0	4.9	5.7	6.5	7.3	8.6

Articulator settings for the custom incisal table

Condylography values used for calculation.

Protrusion at 5 mm: SCI 54,0°.

Mediotrusion right at 5 mm: SCI 49,8° TCI 2,2°.

Mediotrusion left at 5 mm: SCI 58,9° TCI 9,5°.

L for incisal table setting: Sequential disocclusion according to R.S.

Computed using ideal anterior guidance to compute the right curve of Spee

- cusps 3r, 6dr must be in.

e to compute the left curve of Spee - cusps 31, 6dl must be in.

ailed to compute incisor table setting for ideal positions.



Cal	culated	l vertical	cusp tij	p positio	ons					
	Right				Left	Left				
	TA	I-Table	T-S1	T-S2	TA	I-Table	T-S1	T-S2		
1	55.4°	55°	42°	64°	55.4°	55°	42°	64°		
2										
3	45.4°	61°			45.4°	61°		·		
4										
5										
6m										
6d										
7m										
7d										
8m										
8d										

Occlusal Plane Value

Unable to compute the right curve of Spee - cusps 3r, 6dr must be in.

Unable to compute the left curve of Spee - cusps 31, 6dl must be in.

Occlusal plane adjustment for average SCI value: 54° (5 min)

Table 5

Cuspal Angle	20°	25°	30°
Balanced Occlusion 1/6	34°	29°	24°
Balanced Occlusion 1/7	43°	38°	33°
Canine protected Occlusion 1/6	25°	20°	15°
Canine protected Occlusion 1/7	34°	29°	24°

After carrying out the splint therapy and determining the centric relation of the jaws, the casts were remounted in the articulator. Instead of the red insert, we used the white one without the retrusion component and made a prosthetic appliance in the new therapeutic position. We determined the location of the stamp cusps in the mandible according to Weber template and calculation of guidance of each tooth. Lower face height, interincisal angle and OPI are normal. In other words, we determined the centric relation of jaws with the splint. Type of splints: myopathic (relaxational) OPI R= 13

OPI L= 15;

CuIRL = 28-30.

Table 6

Inlay		F	Right	Left			
	3 rd mm	5 th mm	10 ^{to} mm	3 rd mm	5 th mm	10 th mm	
Straight	51°	52°	48°	62°	59°	52°	
Convex	*45°	*48°	*51°	*56°	*56°	*55°	
Retrusive	Red	Red	Red	Yellow	Yellow	Yellow	

Sagittal Condylar Guidance Reference® SL

Table 7

Transversal Condylar Guidance Reference® SL

Inlay	Right				Left	
	3 rd mm	5 th mm	10 th mm	3 rd mm	5 th mm	10 ^m mm
White	*1°	*1°	*1°	*6°	* 7 °	*6°
Yellow	0°	0°	0°	0°	0°	0°
Red	0°	0°	0°	0°	0°	0°
Blue	0°	0°	0°	0°	0°	0°

Gamma Sequence Incisal Table

Condylography values used for calculation Protrusion at 5 mm: SCI 54,0°

Mediotrusion right at 5 mm: SCI 49,8° TCI 2,2°

Mediotrusion left at 5 mm: SCI 58,9° TCI 9.5°

Suggested sequence table setting Protrusion element: ORANGE

Right lateral element: ORANGE Left lateral element: ORANGE

CADIAX® Curves

	Protr	usion	Mediotru	sion right	Mediotrus	ion left
	SI right	SCI left	SCI	TCI	SCI	TCI
1 st	49.9°	65.2°	57.7°	1.0°	64.2°	7,6°
2^{nd}	51.3°	62.7°	55.9°	0.0°	63.2°	8,0°
3 rd	52.3°	60.0°	53.4°	2.5°	61.4°	8,1°
4^{th}	52.0°	58.8°	52.0°	1.8°	60.2°	9,6°
5 th	51.2°	56.8°	49.8°	2.2°	58.9°	9,5°
6 th	50.2°	55.3°	48.4°	1.6°	57.6°	9,4°
8^{th}	48.3°	52.4°	44.3°	1.1°	54.0°	8,0°
10 th	45.3°	48.4°	41.3°	2.0°	49.8°	6,0°
14 th					41.7°	6,3°
	Retru	usion				
-1	23,3°r	54,7°r				
-2		53,5°r				

Table 9

Coordinates of Cusp Tips

		R			Left	
	Х	Y	Z	Х	Y	Z
1	66.30	6.20	48.50	66.00	-2.00	48.50
2						
3	62.00	16.00	4.00	62.00	8.00	47.50
4						
5						
6m						
6d						
7m						
7d						
8m						
8d						

Fabricating post-cores



Custom trays for teeth and transfer coping



Wax-up of mesiocclusion



All of the laterotrusion guidances are transferred to the lingual cusps of the mandible. The protrusive restriction remains on the central incisor of the upper jaw. Laterotrusion canine guidance is on the medline slope of the canine. The bearing cusps in this case are posterior cusps of the upper jaw.

Indices for temporary crowns



Long-term temporary crowns



Production of individual abutments with preliminary formation of the emergence profile.

Final dental restorations



Myopathic or repositioning splint is used to determine the centric relation with bilateral tooth absence, and then it is followed by remounting in the articulator. The discrepancy between the sizes of the passive and active dental arches of the maxilla and mandible is changed due to the reverse overlapping of the teeth when the stamp cusps are transferred to the posterior cusps of the upper molars, and the lateral-torsion guidance to the lingual cusp of the first molar of the mandible. The target points for determining the distal edges 36 and 46 are the occlusal plane and the cutting edge of the lower incisor. The axis of inclination of the central incisor of the mandible is perpendicular to the axis of closing and corresponds to the Page rule.

Thus, the design points for determining the centric relation, the points for calculating OPI and LFH are selected taking into account all the features of prosthetics with a complete removable prosthetic appliance.

Clinical case №7

Patient's birth date: 10/03/1964

Date of examination: September 2008

The patient applied to the medical center with complaints of poor masticatory performance and sensitivity of teeth 12, 11, 21, 22.

According to physical examination, the posterior occlusal plane is positioned too high on the right and left side. Active and passive dental arches do not match. The palatal inclination of the canine does not provide for a canine guidance. The implants were placed earlier in another clinic without an operating template and preliminary planning of prosthodontic structures.

Intraoral photographs





An algorithm for the sequence of making a prosthetic appliance for dentitions with a bilateral end defect of the mandible and an overestimated posterior occlusal plane on the molars of the maxilla using prosthodontic structures with support on implants has been determined.

Compensatory strategy is applied for making a prosthetic appliance of dental class I with reduced lower facial height. We created space for the manufacture of crowns on implants due to the lack of vertical space.

Materials and methods for diagnosis and treatment:

Dental and clinical history, condylography and cephalometric analysis, analysis of maxillar and mandibular models, splint therapy and following determination of the centric relation of the jaws, mounting the models in the articulator and a wax-up.

The patient's clinical dental history was taken. The general medical analysis revealed rheumatism and concussion due to an injury in an accident.

	Dental History Analysis	Valuation	Yes	No
1.	Do you have problems when you chew?			Х
2.	Do you have problems when you are talking?			Х
3.	Do you have problems in closing your teeth property?			Х
4.	Are any of your teeth especially sensitive?	0	Х	
	Кислое 11, 21, 22, 12			
5.	Do you have problem when you open your mouth very			Х
	wide?			
6.	Do your jaw joints make noise and if so, on what side?			Х
7.	Do you have pain in the area of your jaw joints?			Х
8.	Do you suffer from headaches?		Х	
9.	Do you suffer from cramps or spasm in your head, neckor		Х	
	throat?			
10.	Do you have in general problems with your posture?			Х
	Occlusal Index	0.00		
11.	Have you ever had serious accident? Сотрясение мозга	Х		
	мотоцикле			
12.	Did you have one or more oral intubations?			
13.	Have you ever had orthodontic treatment or	•		Х

14.	Have you had a treatment with splint?		Х
15.	Are you grinding or pressing with your teeth?		Х
16.	Do you think that treatment is necessary?	Х	
17.	Do you think that there is a serious disorder or illness?		
18.	When the last time you had dental treatment and what was d	lone?	

Table 2

Special Medical Analysis							
Do you have or did ever have an illness with regard to point 1-12?							
		yes	no				
1.	Infections						
2.	Cardo-vascular systems						
3.	Respiratory system						
4.	Digestive system						
5.	Metabolic system						
6.	Allergies						
7.	Urogenital problems						
8.	Central nervous system						
9.	Psychological problems (therapy)						
10.	Rheumatic disease - Ревмаизм	Х					
11.	Hormonal disease						
12.	Special problems						
Main concern:							

Table 3

Muscles palpation

Muscle Diagnosis		Right		Left	
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae		Х		Х
6.	M.pterygoideus medialis				
7.	M.mylohyideus				
8.	M.digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				

15.	Comparative palpation of jaw joints*		
	a) Lateral poles, statically		
	b) Lateral poles, in rotation		
	c) Retral joint space		
	d) Lig.temporo-mandibulare		

Muscles palpation



Upon mounting the casts in the articulator, the initial contact occurs on the tooth 24 and 25, 34 and 35.

Panoramic radiograph



Thus, dental history and physical examination revealed the following issues:

- > Over-crowding of central teeth in the mandible.
- Mismatching upper and lower dental arches.
- > Active and passive dental arches do not fit together.
- ▶ Palatal inclination of the canine teeth in the lower jaw.
- \succ Extrusion 17.
- Chipping on the lower premolars 13 and 21.
- ➢ Palatal root resorption 14 should be removed.
- According to CT in the area of teeth 16 and 27, there are clearly visible cysts on palatal roots.
- ▶ No occlusal support in the posterior areas of the lower dentition.

Treatment Plan

- 1. Removal of teeth 16, 14, 27, 24
- 2. Splint therapy. Vertical adjustment 5 mm. We can increase the vertical dimension. Both jaws are in the protrusive position.
- 3. The second clinical functional and instrumental analysis and articulator settings are based on the result of splint therapy with long-term temporary crowns.
- 4. Making a model of the anterior restriction and canine guidance
- 5. Restoring the posterior occlusal support in occlusion class I.
- 6. Occlusal concept: consistent opening.

Objectives: reduce the palatal inclination of the canine teeth, remove teeth over-crowding in the mandible and change the interincisal angle.

Condylography

The beginning and end of the movement do not match. There is strong negative rotation at the beginning of the movement. The left retrusion is of poor quality and it is shortened.

Muscle difficulties.



The gamma rotation is negative because of deformed shape of the TMJ condyle after suffering rheumatism.



The Bennett angle is negative and there might be a midline deviation of the disc or obstacle avoidance mechanism.





Muscle difficulties. There is retrusion at the beginning of the movement.





Speaking 50 - 60



The condyle is pressed to the eminentia articulare ossis temporalis due to bruxism.

Cephalometric Analysis

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial. The skeletal trend of the mandible is bra chyfacial.

Skeletal class is I.

The maxilla is positioned prognathic The mandible is positioned prognathic, with tendency to neutral.

Lower facial height is normal Dental class unknown.

The protrusion of the upper incisor is increased.

The inclination of the upper incisor is increased.

The protrusion of the lower incisor is increased.

The inclination of the lower incisor is increased.

The interincisal angle is diminished.

Occlusal concept: Group function. No functional statement available.


Explanation

Table 4

Determinants	Norm	Value	Trend	Norm	Value	Trend
Facial Axis	90.0°	90.3		90.0°	88.8	
Facial Depth	91.5°	87.4	1-*	91.5°	86.4	1-*
Facial Taper	68.0°	68.0		68.0°	67.5	
Mandibular Plane	21.5°	24.5		21.5°	26.0	1D*
Related Values	Norm	Value	Trend	Norm	Value	Trend
Bjoerk Sum	396.0°	385.4	4+-***>	396.0°	386.9	3-***
Facial Lenghth Ratio	63.5%	73.0	4+***>	63.5%	71.9	4+***>
Y Axis to S N	67.0°	64.0		67.0°	65.2	
Y Axis (Downs)	61.8°	61.6		61.8°	62.8	
S N to Gonion Gnathion	31.6°	25.4	1-*	31.6°	26.9	1-*
Angle						

We can increase lower facial height as both jaws are protrusive and leave the teeth function in the form of consistent opening of the dentition.

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	90.3	
Facial Depth	91.5°	87.4	1-*
Mandibular Plane	21.5°	24.5	
Facial Taper	68.0°	68.0	
Mandibular Arc	31.2°	37.0	1B*
Maxillary Position	65.0°	66.9	
Convexity	-1.0 mm	2.4	1X*
Lower Facial Height (by R. Slavicek)	44.2°	48.3	
Lower Facial Height to Point D	50.7°	51.2	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	113.0	1-*
Upper Incisor Protrusion	4.3 mm	5.7	
Upper Incisor Inclination	23.1°	32.5	1+*
Upper Incisor Vertical	mm	0.0	
Lower Incisor Protrusion	1.2 mm	5.7	1+*
Lower Incisor Inclination	24.1°	34.4	1+*
Upper Molar Position	21.0 mm	23.1	1+*
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	11.5	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	11.2	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	33.5	
Radius of Curve of Spee	mm	75.6	
Lip Embrasure	0.0 mm	0.2	

Table 5

Occlusal Plane Xi Distance	-1.4 mm	0.4	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	68.5	
Horizontal Condylar Inclination left	⁰	71.6	
Horizontal Condylar Inclination	⁰	70.0	
Relative Condylar Inclination	⁰	58.5	
Relative Condylar Inclination 6	⁰	63.7	
Relative Condylar Inclination 7	⁰	57.2	
Relative Condylar Inclination 8	⁰	70.0	
Anterior Guidance (S-AOP)	0	54.2	
Relative Anterior Guidance	0	42.7	
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-0.2	1+*

SCI right = 68.5 degrees;

SCI left = 71.6 degrees very steep slope;

Symmetrical case AG (anterior restriction) = 54.2 degrees;

The anterior restriction is based on SCI +10 degrees, but not more than 60 degrees OPI= 11.

DOA for the right molar is 28 degrees DOA for the left molar is 30 degrees

Low masticatory performance is observed. Lower facial height is reduced.

Compensatory backwards rotation of the mandible since there were no chewing teeth for a long time.

Table 6	5
---------	---

Sato Analysis			
Denture frame analys	is Norm	Value	Trend
FH – MP	25.9°	23.0	
PP – MP	24.6°	20.5	1-*
OP – MP	13.2°	15.4	
OP - MP / PP - MP	54.0%	75.3	2+**
AB – MP	71.3°	73.3	
$A^{\sim} - P^{\sim}$	50.0 mm	41.2	1+*
A` - 6`	23.0 mm	16.6	2+**
$A^{-} - 6^{-} / A^{-} - P^{-}$	50.0 %	40.3	
U1 – AB (degree)	31.7°	33.4	
U1 – AB (mm)	9.5 mm	6.0	2-**
L1 – AB (degree)	25.4°	33.5	
L1 – AB (mm)	6.2 mm	6.0	

Inter moral angle	174.0°	158.6	4+***>
FH – PP	1.3°	2.4	1+*
Kim analysis	Norm	Value	Trend
ODI	72.0°	75.8	
APDI	81.0°	86.1	1+*
Combination factor	153.0°	161.9	
Downs-Graber analysis	Norm	Value	Trend
Facial Angle	85.1°	87.4	
Convexity	-5.6°	-5.4	
AB – Facial plane angle	-5.1°	-3.7	
FH – MP	25.9°	23.0	
Y Axis	65.7°	61.6	1+*
FH – OP	9.5°	7.5	
Interincisal angle	129.7°	113.0	1+*
L1 – OP	68.0°	58.0	1+*
L1 – MP	94.7°	106.8	1D*
U1 – A.POG	7.9 mm	5.7	
FH – SN	6.0°	2.4	1+*
SNA Angle	81.9°	87.6	1D*
SNB Angle	78.6°	85.0	2D**
ANB Angle	3.3°	2.5	
U1 – Facial Plane (mm)	9.9 mm	7.2	
U1 – FH (degree)	108.9°	117.0	1+*
U1 – SN (degree)	103.1°	114.6	2+**
Gonial angle	119.4°	123.2	
Ramus Inclination	2.6°	10.4	1+*

ODI 75,8: normal.

APDI 86,1 tends to class III.

Overbite depth indicator (ODI). Anteroposterior dysplasia indicator (APDI).



Overbite Depth Indicatop (ODI)

AJO 65:586-611, 1974.

The A-B plane to the mandibular plane plus or minus. The palatal plane to the Frankfort horizontal plane angle*.

Table 7

	Normal (N=119)	Deep bite (N=174)	Open bite (N=56)
Mean	74.50°	77.7°	65.5°.
S.D.	6.07°	6.58°	6.13°

CAUCASIAN SAMPLE

The correlation coefficient the incisor over-bite was 0.588 (highest correlation in 43 measurements tested).

	N	Mean	S.D.	Source
~	-		5 33 0	
Chinese	50	72.83°	5.22°	Peking University
Japanese	46	72.34°	4.82°	Koyama, Ikegami
Korean	190	71.95°	5.29°	Suh, Park

* When the palatal plane slopes downward and forward, the angle is read in the positive figure. When the plane slopes upward and forward, the angle is read in the negative figure.

Anteroposterior Dysplasia Indicator (APDI)

Overbite depth indicator (ODI). Anteroposterior dysplasia indicator (APDI).

AJO 73: 619-633, 1978.

The facial plane the FH plane plus or minus.

The A-B plane to the facial plane plus or minus*. The palatal plane to the FH plane angle.

Table 8

CAUCASIAN SAMPLE

	Normal (N=102)	C1.I (N=174)	C1.II (N=624)	C1.III (N=36)
Mean	81.37°	80.36°	75.24	88.50°.
S.D.	3.79°	4.45°	4.36°	6.68°

The correlation coefficient against the molar displacement was 0.643 (highest correlation in 30 measurements tested).

	N	Mean	S.D.	Source
Chinese	50	81.10°	4.04°	Peking University
Japanese	46	80.61°	3.82°	Koyama, Ikegami
Korean	90	81.04°	4.35°	Suh, Park

*When the point B is behind the point A, the angle is read in the negative figure (Downs' A-B plane angle).

Articulator settings

Lower face height is increased from 48.3 to 50.3 degrees by + 5 mm with an incisal pin. OPI changes from 11 to 13 degrees.



Table 9

Slavicek Analysis	Slavicek Analysis					a	
Skeletal Measurement	Norm	Value	Trend		Norm	Value	Trend
Facial Axis	90.0°	90.3			90.0°	88.8	
Facial Depth	91.5°	87.4	1-*		91.5°	86.4	1-*
Mandibular Plane	21.5°	24.5			21.5°	26.0	1D*
Facial Taper	68.0°	68.0			68.0°	67.5	
Mandibular Arc	31.2°	37.0	1B*		31.2°	36.1	1B*
Maxillary Position	65.0°	66.9			65.0°	66.9	
Convexity	-1.0 mm	2.4	1X*		-1.0 mm	3.4	2X**
Lower Facial Height (by R. Slavicek)	44.9°	48.3			44.9°	50.3	
Lower Facial Height to Point D	51.4°	51.2			51.4°	53.2	
Dental Measurement	Norm	Value	Trend		Norm	Value	Trend
Interincisal Angle	132.8°	113.0	1-*		132.8°	111.5	1-*
Upper Incisor Protrusion	4.3 mm	5.7			4.3 mm	6.3	
Upper Incisor Inclination	23.1°	32.5	1+*		23.1°	34.4	1+*
Upper Incisor Vertical	mm	0.0			mm	-2.0	
Lower Incisor Protrusion	1.2 mm	5.7	1+*		1.2 mm	5.4	1+*
Lower Incisor Inclination	24.1°	34.4	1+*		24.1°	34.0	1+*
Upper Molar Position	21.0 mm	23.1	1+*		21.0 mm	23.1	1+*
Occlusal Plane	Norm	Value	Trend		Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	11.5			⁰	13.0	

Idealized Occlusal Plane – Axis Orbital Plane	⁰	11.2		°	10.8	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	33.5		40.9 mm	33.5	
Radius of Curve of Spee	mm	75.6		mm	75.6	
Lip Embrasure	0.0 mm	0.2		0.0 mm	-2.0	
Occlusal Plane Xi	-1.4 mm	0.4		-1.4 mm	0.7	
Distance	Norma	Value	Trond	Norma	Volue	Trond
Functional Measurement	Norm	value	1 rena	Norm	value	Irena
Inclination right	⁰	68.5		⁰	68.5	
Horizontal Condylar Inclination left	°	71.6		°	71.6	
Horizontal Condylar Inclination	⁰	70.0		°	70.0	
Relative Condylar Inclination	°	58.5		°	57.0	
Relative Condylar Inclination 6	°	63.7		°	62.3	
Relative Condylar Inclination 7	°	57.2		°	55.7	
Relative Condylar Inclination 8	⁰	70.0		⁰	70.0	
Anterior Guidance (S- AOP)	⁰	54.2		⁰	54.2	
Relative Anterior Guidance	⁰	42.7		⁰	41.2	
Esthetic Measurement (Lip Relation)	Norm	Value	Trend	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-0.2	1+*	-2.9 mm	-0.2	1+*

The maxilla and mandible casts are mounted in articulator according to the individual hinge axis.

Centric Relation



Casts in the articulator are set in the centric relation



Custom tray for molding teeth



Operating Template



Individual transfer copings for imprint impressions.

Final dental restorations



Clinical case №8

Patient's birth date: 20/05/1974

Date of examination: 2010

The patient applied to the medical center with complaints of poor masticatory performance, poor esthetic look and sensitivity of tooth 15.

Examination revealed:

- Absence of support in the posterior areas as a result of the secondary partial loss of teeth.
- Absence of canine restriction and anterior guidance.
- Attrition facets on the teeth in the anterior area of the maxilla and mandibles.
- Palatinal inclination of canine teeth.
- > Deep overbite.
- Occlusion class I.
- ▶ Extrusion of teeth 17 and deformed occlusal plane.
- ➤ Gingival recession of class I in area 13,14,15,17,25,46.
- Cervical abfraction of non-carious origin of 13,15.
- Lower facial height is reduced.

Intraoral photographs



Cast models



The medical history of the patient is complicated by cardiovascular diseases, Dental history revealed hypersensitivity in the area of tooth 15. According to the patient there was a noise in the area of both joints and muscle spasm during prolonged mouth opening.

Table 1

Der	ntal Histo	ry Analysi	S			Valuati	on	Yes	No
1.	Do you ha	ve problems	when you ch	ew?		1		Х	
2.	Do you ha	ve problems	when you are	e talking?		1		Х	
3.	Do you ha	ve problems	in closing yo	our teeth pro	perty?				Х
4.	Are any of	your teeth e	specially sen	sitive? 15		1		Х	
5.	Do you ha	ve problem v	when you ope	en your mou	th very	1		Х	
	wide? There is muscle spasm during prolonged								
	opening								
6.	Do your ja	w joints mak	e noise and i	f so, on what	at side?	1		Х	
	Both sides	5							
7.	Do you have pain in the area of your jaw joints?						Х		
8.	Do you suffer from headaches? 1					Х			
9.	Do you suffer from cramps or spasm in your head, neckor					Х			
	throat?				_				
10.	Do you ha	ve in general	problems wi	ith your pos	ture?	2		Х	
				Occ	lusal Index	1.14			
11.	Have you	ever had serie	ous accident?	?					Х
12.	Did you ha	ave one or me	ore oral intub	oations?					Х
13.	Have you	ever had orth	odontic treat	ment or					Х
14.	Have you l	had a treatme	ent with splin	.t?					Х
15.	Are you gr	inding or pre	essing with ye	our teeth?				Х	
16.	Do you thi	nk that treatr	nent is neces	sary?				Х	
17.	Do you thi	nk that there	is a serious o	disorder or i	llness?				
18.	When the	last time you	had dental tr	eatment and	d what was	done?			
	How woul	d you describ	e your psych	nic behavior	?				
19.	happy	sad	calm	excited	self-contr	rolled	lack	of self	-control

Table 2

Special Medical Analysis						
Do yo	Do you have or did ever have an illness with regard to point 1-12?					
		Yes	No			
1.	Infections					
2.	Cardo-vascular systems	Х				
3.	Respiratory system		Х			
4.	Digestive system		Х			
5.	Metabolic system		Х			
6.	Allergies		Х			
7.	Urogenital problems		Х			
8.	Central nervous system		Х			
9.	Psychological problems (therapy)		Х			
10.	Rheumatic disease		Х			
11.	Hormonal disease		Х			
12.	Special problems					
Main	concern:					

Table 3

Muscle Diagnosis			Right		Left
	0	+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae	Х			Х
6.	M.pterygoideus medialis	Х			Х
7.	M.mylohyideus				
8.	M.digastricus			Х	
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus	Х		Х	
14.	Tongue				
15.	Comparative palpation of jaw joints*				
	a) Lateral poles, statically				
	b) Lateral poles, in rotation				
	c) Retral joint space				
	d) Lig.temporo-mandibulare			Х	

Palpation of the muscles revealed bilateral symmetrical sensitivity, which may indicate a sign of either improper transverse condylar position or a decrease in lower facial height. Discomfort on the left m.digastricus, m.omohyoideus of the temporomandibular ligament was also revealed during the palpation.

Panoramic radiograph



2009 November, 2010: implants in areas 36 and 37

Thus, dental history and physical examination revealed the following issues:

- ➤ Absence of occlusal support in the posterior areas of the mandible.
- ➢ Upper and lower dental arches don't fit together.
- ➢ Flat, poorly expressed anatomical shape of cusps of molar teeth.
- Extrusion of the tooth 17 and deformation of the occlusal plane.
- Absence of retrusion restriction, anterior guidance and canine restriction.
- Poor esthetic.
- Poor masticatory performance.
- ➢ Poor oral hygiene.

Diagnosis:

- Dental Class I.
- Remove functional limitations of the mandible mobility (muscle difficulties).

Treatment objectives:

- Expand upper and lower dental arches.
- Increase lower facial height.
- Change the posterior occlusal plane.

- Restore the posterior occlusal support in occlusion class I with the canine guidance.
- ➢ Remove the posterior occlusal interference.

Treatment Plan:

- 1. Occupational oral hygiene.
- 2. Clinical instrumental analysis.
- 3. Splint therapy and remounting the models in the articulator after the procedure.
- 4. Wax-up.
- 5. Manufacturing long-term temporary restorations.
- 6. Veneers: 13, 14, 15, 43, 44, 33, 23.
- 7. Crowns: 17, 24, 25, 26, 27, 35, 46, 47.
- 8. Implant supported crowns: 16, 36, 37, 34, 45.

Condylography

Protrusion-retrusion

Opening-closing



There is an asymmetry of the right and left protrusion-retrusions.



There is a redetrusion in the left joint with mediotrusion on the right side and negativeBennett angle.

Cephalometric Analysis

Table 3

Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	⁰	11.7	
Idealized Occlusal Plane – Axis Orbital Plane	⁰	12.3	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	33.5	
Radius of Curve of Spee	mm	73.8	
Lip Embrasure	0.0 mm	2.3	
Occlusal Plane Xi Distance	-1.4 mm	1.4	
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	⁰	51.2	
Horizontal Condylar Inclination left	⁰	51.2	
Horizontal Condylar Inclination	⁰	51.2	
Relative Condylar Inclination	⁰	39.5	
Relative Condylar Inclination 6	⁰	32.5	
Relative Condylar Inclination 7	⁰	32.2	
Relative Condylar Inclination 8	⁰	51.2	
Anterior Guidance (S-AOP)	0	40.2	
Relative Anterior Guidance	0	28.4	
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-2.3	
Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	94.2	1B*
Facial Depth	91.5°	90.6	
Mandibular Plane	21.5°	18.0	

Facial Taper	68 0°	71.2	
	00.0	/1.2	
Mandibular Arc	31.2°	40.1	2B*
Maxillary Position	65.0°	70.1	2+**
Convexity	-1.0 mm	1.3	1X*
Lower Facial Height (by R. Slavicek)	42.8°	40.6	
Lower Facial Height to Point D	49.3°	45.0	1-*
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	124.0	
interineisar i ingre	152.0	12	
Upper Incisor Protrusion	4.3 mm	5.2	
Upper Incisor Protrusion Upper Incisor Inclination	4.3 mm 23.1°	5.2 29.2	
Upper Incisor Inclination Upper Incisor Vertical	4.3 mm 23.1° mm	5.2 29.2 2.1	
Upper Incisor Protrusion Upper Incisor Inclination Upper Incisor Vertical Lower Incisor Protrusion	4.3 mm 23.1° mm 1.2 mm	5.2 29.2 2.1 1.8	
Upper Incisor Protrusion Upper Incisor Inclination Upper Incisor Vertical Lower Incisor Protrusion Lower Incisor Inclination	4.3 mm 23.1° mm 1.2 mm 24.1°	5.2 29.2 2.1 1.8 26.6	





Lower facial height is reduced.

The position of the maxilla and mandible is neutral.

The interincisal angle is 124 degrees. The occlusal plane on the left is 11.7°.

We used Weber template to determine the calculation of the guidance for 23 and 21.

Articulator Settings



- The initial contact in the reference position occurs on teeth 45, 15. When we remove these teeth from a split cast model, the second contact will occur on teeth 17, 47. When we change the occlusal position by extracting these tooth from the cast model, the third contact is made on teeth 25, 35. Incisal pin = -0.5 mm.
- > Orange incisal pin table = 47 degrees for canine guidance.
- > Blue incisal pin table = 51 degrees for canine guidance.



OPI right =10 degrees.

OPI left =10 degrees.

Remounting casts in the articulator after splint therapy for a diagnostic

wax-up



Final dental restorations



After 5 years



Conclusion

Use of tooth/joint compensation mechanisms and clinical conclusions on the results of condylographic and cephalometric analyses, muscle palpation data analysis, plaster casts and splint therapy made it possible to improve aesthetic parameters of the face and smile, as well as to restore masticatory performance. The change of the occlusal plane made it possible to correct the angle of disocclusion and restore the masticatory performance. After splint therapy and 14-days follow-up and achieving favorable muscle state, new casts of the mandible were made in the new therapeutic position with subsequent wax-up, forming canine guide and laterotrusive guidances, retrusive restriction.

Clinical case №9

Patient's birth date: 29/01/1977

Chief complaint: chipping of enamel of the central incisors of the maxilla and mandible. Complaints of pain in the masticatory muscle during prolonged chewing and increased tooth sensitivity when eating cold food and the absence of reproducible centric occlusion.

Bruxism.

Physical examination revealed enamel chippings on the central incisors of the maxilla, wedge-shaped defects on the incisors, canine teeth, premolars of the maxilla and mandibles, attrition facets on the molars of both jaws, over-crowding of the teeth in the mandible.

Intraoral photographs



Table 1

Special Medical Analysis					
Do y	Do you have or did ever have an illness with regard to point 1-12?				
		Yes	No		
1.	Infections	Х			
2.	Cardo-vascular systems (высокое давление)		Х		
3.	Respiratory system		Х		
4.	Digestive system		Х		
5.	Metabolic system		Х		
6.	Allergies		Х		
7.	Urogenital problems		Х		
8.	Central nervous system		Х		
9.	Psychological problems (therapy)		Х		
10.	Rheumatic disease		Х		
11.	Hormonal disease		Х		
12.	Special problems		Х		
Main	concern: no special concerns				

Table 2

Der	ntal Histor	ry Analysis				valuatio	on	yes	no
1.	Do you hay	ve problems v	when you che	w?					Х
2.	Do you hay	ve problems v	when you are	talking?					Х
3.	Do you hay	ve problems i	n closing you	r teeth prop	erty?			Х	
4.	Are any of	your teeth es	pecially sensi	itive?				X	
5.	Do you hay	ve problem w	hen you oper	n your moutl	n very				Х
	wide?								
6.	Do your ja	w joints make	e noise and if	so, on what	side?				Х
7.	Do you have pain in the area of your jaw joints?						Х		
8.	Do you suf	ffer from head	laches?						Х
9.	Do you suf	ffer from cran	nps or spasm	in your head	d, neck				Х
	or throat?								
10.	D. Do you have in general problems with your posture?X					Х			
				Occlus	al Index	0.0	00		
11.	Have you	ever had serio	us accident?	just bone b	reaks (n	nany)			
12.	Did you ha	ive one or mo	re oral intuba	ations?					Х
13.	Have you	ever had ortho	odontic treatn	nent or					Х
14.	Have you l	had a treatme	nt with splint	?					Х
15.	Are you gr	inding or prea	ssing with yo	ur teeth?				Х	
16.	Do you thi	nk that treatm	nent is necess	ary?					
17.	Do you thi	nk that there	is a serious di	sorder or ill	ness?				Х
18.	When the l	last time you	had dental tre	atment and	what wa	s done?			
	1,5 years ago, general tooth fillings								
	How would	d you describ	e your psychi	c behavior?					
19.	happy	sad	calm	excited	self-co	ontrolled	lac	k of self	E-control
						Х			

Panoramic radiograph



Esthetic assessment of the anterior group of maxillar teeth.

Table 3

Tooth	Lenght	Width
13	12.11 мм	7.11 мм
12	11.46 мм	6.32 мм
11	10.00 мм	8.49 мм
21	10.33 мм	8.28 мм
22	10.72 мм	7.20 мм
23	11.57 мм	7.88 мм

Cybernetic system of the masticatory organ



There are defects on the incisal edge due to functional overload.



Maxillar and mandibular casts in central occlusion.



The abrasion of enamel and dentin leads to a decrease in lower facial height.



A large clinical functional analysis is indicated.

Condylography

Protrusion/retrusion



In the right and left temporomandibular joint the length of the path is reduced. Gammarotation is about 1°.



Muscle activity



Protrusion - retrusion - opening - closing



Right and left mediotrusion revealed retrusion and protrusion components on the mediotrusion side, i.e. the joint on the opposite side is involved in mediotrusion and instead of rotation we have a translational component. Speech is produced at the bottom part of opening and closing and in a distraction. It is caused by the lack of support and a decrease in lower facial height in the posterior teeth area. Compression occurs in the right TMJ due to bruxism.

Cephalometric Analysis

Cephalometric analysis revealed that both jaws were in the protrusion position that allowed to increase lower facial height.

The asymmetric case must be calculated on both right and left sides separately.

SCI R = 53° .

SCI L = 48° .

Table 4

Slavicek Analysis					
Skeletal Measurement	Norm	Value	Trend		
Facial Axis	90.0°	92.7			
Facial Depth	91.5°	89.8			
Mandibular Plane	21.5°	19.5			

Facial Taper	68.0°	70.6	
Mandibular Arc	31.2°	34.1	
Maxillary Position	65.0°	74.0	3+***
Convexity	-1.0 mm	5.7	3X***
Lower Facial Height (by R. Slavicek)	43.3°	44.1	
Lower Facial Height to Point D	49.8°	47.1	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8°	120.7	1-*
Upper Incisor Protrusion	4.3 mm	6.9	1+*
Upper Incisor Inclination	23.1°	33.6	1+*
Upper Incisor Vertical	mm	4.4	
Lower Incisor Protrusion	1.2 mm	2.6	
Lower Incisor Inclination	24.1°	25.6	
Upper Molar Position	21.0 mm	26.0	2+**
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	°	4.5	
Idealized Occlusal Plane – Axis Orbital Plane	°	12.4	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	37.9	
Radius of Curve of Spee	mm	66.3	
Lip Embrasure	0.0 mm	4.6	1+*
Occlusal Plane Xi Distance	-1.4 mm	-6.1	1-*
Functional Measurement	Norm	Value	Trend
Horizontal Condylar Inclination right	°	48.7	
Horizontal Condylar Inclination left	°	53.3	
Horizontal Condylar Inclination	°	51.0	
Relative Condylar Inclination	°	46.5	
Relative Condylar Inclination 6	°	26.1	
Relative Condylar Inclination 7	°	24.3	
Relative Condylar Inclination 8	⁰	51.0	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance	0		
Esthetic Measurement (Lip Relation)	Norm	Value	Trend
Esthetic Plane	-2.9 mm	-2.2	

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial. The skeletal trend of the mandible is mesiofacial Skeletal class is II.

The maxilla is positioned extremely prognathic. The mandible is positioned prognathic with tendency to neutral. The lower facial height is normal. Dental class unknown.

The protrusion of the upper incisor is increased. The inclination of the upper incisor is increased. The protrusion of the lower incisor is normal. The inclination of the lower incisor is normal. The interincisal angle is diminished. Occlusal concept: Unknown (data missing). No functional statement available.

Explanation

Table	5
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Deteminants	Norm	Value	Trend
Facial Axis	90.0°	92.7	
Facial Depth	91.5°	89.8	
Facial Taper	68.0°	70.6	
Mandibular Plane	21.5°	19.5	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	384.2	4 -***>
Facial Lenghth Ratio	63.5%	75.8	6 +***>
Y Axis to S N	67.0°	69.8	
Y Axis (Downs)	61.2°	64.6	
S N to Gonion Gnathion Angle	32.6°	24.2	2 -**

Treatment Plan:

- 1. Osteopathic treatment.
- 2. Psychological correction.
- 3. Selective grinding areas 18, 28, 38, 48.
- 4. Redefining the centric relation.
- 5. Casts in reference position.
- 6. Wax-up.
- 7. Long-term temporary crowns.
- 8. Second condylography and cephalometric analysis.
- 9. Producing final restorations.

Treatment objectives:

- Determining the centric relation.
- Creating anterior restriction.
- Producing canine guidance.

- Sagittal and transversal planes of the dental arches must fit together.
- \blacktriangleright Change in the occlusal plane with an disocclusion angle of 8-10°.
- ➢ Dental Class I.
- ➢ Dental Class II.

Cephalometric Analysis



Articulator Settings



Casts in the centric relation



Casts in RP



Determining the anterior guidance



Occlusal plane measurement



We increased lower facial height by 3 mm and filled the gap between the central incisors by incisors of the maxilla and the mandible equally. The point of contact corresponds to the lip line. Upper 2 incisors from the palatal line, all stamp cusps, canine guidance and anterior restriction are restored. We carried out the preliminary selective grinding of area 18, 28, 38, 48. The incisal pin is decreased by 5 mm. After that, vertical positioning was carried out.

Wax-up


Final Dental Restoration



Conclusion

The application of data collection algorithms for the diagnosis and treatment of patients with TMJ and total dental restorations made it possible to halve the time for patients and reduce risks that arise 1.3 or 5 years after the treatment. Taking into consideration both static and functional parameters, we managed to achieve a synergy.

E.g. bruxism may originate in psychology first and then manifest in occlusion, being a common "solution to a deferred problem". And vice versa, an interfering contact on the occlusal surface of the tooth can cause the development of bruxism.

Therefore, I carried out treatment of patients with TMJ disorders and total restorations with leveraging on the sum of knowledge on the function, dysfunction and esthetics of the masticatory organ.

Clinical case №10

Patient's date of birth: 26/05/1984

Date of examination: 18.03.2021

A patient came to the medical center after orthodontic treatment with complaints on inability to chew food.

Physical examination revealed:

- ➤ Canines are inclined buccally.
- ➤ Midline shifted to the left.
- ➤ Dental class I with tendancy to III.
- Abfractions and grinding facetts.
- Chipping of composite restorations.

Intraoral picture. March 2021









Intraoral pictures. March 2021





Occlusal plane upper and lower jaw.





Dental class I with tendancy to III Cross bite left side



Trema 23. No posterior support and posterior OPI is steep with steps



Table 1

Special Medical Analysis								
Do you have or did ever have an illness with regard to point 1-12?								
		Yes	No					
1.	Infections		Х					
2.	Cardo-vascular systems		Х					
3.	Respiratory systems		Х					
4.	Digestive system		Х					
5.	Metabolic system		Х					
6.	Allergies	Х						
7.	Urogenital problems		Х					
8.	Central nervous system		Х					
9.	Psychological problems (therapy)		Х					
10.	Rheumatic disease		Х					
11.	Hormonal disease		Х					
12.	Special problms		Х					
Ma	in concern: aesthetic, low chewing efficacy		Main concern: aesthetic, low chewing efficacy					

		Valuation	Yes	No
Der	ital History Analysis			
1.	Do you have problems when you chew?			Х
2.	Do you have problems when you are talking?			Х
3.	Do you have problems in closing you teeth			Х

	property?						
4.	Are any of	your teet	h especially s	ensitive?			Х
5.	Do you have problem when you open your			open your			Х
	mouth very	r					
_	wide?						
6.	Do you jaw joints noise and if so, on what side?					X	
7.	Do you hav	ve pain in	the area of ye	our jaw joints?			Х
8.	Do you suf	fer from	headaches?				X
9.	Do you suf	fer from	cramps or spa	is in your head,			Х
	neck						
	or throat?						
10.	Do you hav	ve in gene	eral problems	with your			X
	posture?			0 1 11 1	0.00		
	Occlusal Index 0.00						
11.	Have you ever had serious accident?			nt?			X
12.	Did you have one or more oral intubations?					Х	
13.	Have you ever had orthodontic treatment or					Х	
14.	Have you had a treatment with splint?			lint?			Х
15.	Are you gri	inding or	pressing with	your teeth?			Х
16.	Do you thin	nk that tre	eatment is nec	cessary?			Х
17.	Do you thin	nk that is	a serious disc	order or			Х
	illness?						
18.	When the last time you had dental treatment and what was done?						
19.	How would	l you des	cribe your psy	ychic behavior?			
	happy	sad	calm	excited	self-controlled	lack of self-	control
	X						

Prelin	ninary Brainstem Nerve Analysis
1.	N. olfactorious (analysis)
2.	N. opticus (analysis)
3.	N. occulo-motorius (clinical mobility)
4.	N. trochlearis (clinical mobility)
5.	N. trigeminus (clinical palpation and sensitiveness)
6.	N. abducens (clinical mobility)
7.	N. facials (clinical mobility)
8.	N. stato-acusticus (clinical check of the equilibrim and hearing)
9.	N. glosso-pharyngeus (clinical and analysis)
10.	N. vagus (analysis)
11.	N. accessories (clinical and analysis)
12.	N.hypoglossus (clinical and analysis)



		Right		Left	
		+	++	+	++
Mu	scle Diagnosis				
1.	Shoulders and neck				
2.	Atlanto-occipitalal region				
3.a	M. temporalis ant.			Х	
3.b	M. temporalis med.				
3.c	M. temporalis post.				
4.a	M. masseter (superficialis)				
4.b	M. masseter (deep)				
5.	Tuber maxillae				
6.	M. pterygoideus medialis				
7.	M. mylohyideus				
8.	M. digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M. sterno-cleido-mastoideus				
13.	M. omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw joints				

a. Lateral poles, statically						
b. Lateral poles, in rotation						
c. Retral joint space				Х		
d. Lig. temporo-mandibulare				Х		
 Ligament and capsule, TMJ positi 	Ligament and capsule, TMJ position					

Sets of muscles:	
Muscle palpation	
Posture	1,2, 7, 12, 13, 14
Closing	3a, 3b, 4a, 4b, 5
Opening / Protraction	8, 9, 10
Retraction	3c, 8
Medio-/Laterotraction	6, 3a, 4a
Hyoid-Position	8, 9, 10, 11, 13
Functions	7, 8, 9,10, 11, 14
TMJ	15a, 15b, 15c, 15d
Closing, TMJ	

List of problem:

- ➢ No posterior support.
- ➢ No retrusive control.
- ➢ No anterior guidance.
- ➢ Cross bite left side.
- ➢ Parodontal problems.
- \succ Esthetics.
- \succ No chewing efficacy.

This mean that there are indications for performing a considerable functional instrumental analysis: condylography, model analysis, cephalometric analysis, aesthetic analysis.

Condylography

Hinge axis kinematic vs Arbitrary



Condylography imaging revealed the following:

- Decreasing protrusion-retrusion path length
- Weakening TMJ ligamentous apparatus

Protrusion/retrusion (left)

Open-close



Speech 50-60 Interference in frontal area and backward movement

Time curve. Muscle problems

Gamma rotation – norm

Mediotrusion (right)

Mediotrusion (left)

Lateral X ray

Cephalometric Analysis

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0	83.2	2D**
Facial Depth	91.5	90.0	
Mandibular Plane	21.5	26.7	1D*
Facial Taper	68.0°	63.1	1D*
Mandibular Arc	31.2	18.3	3D***
Maxillary Position	65.0	58.7	2-**
Convexity	-1.0 mm	-1.2	
Lower Facial Height (by R. Slavicek)	45.1°	54.2	1+*
Lower Facial Height to Point D	50.3	57.1	1+*
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.3	127.6	
Upper Incisor Protrusion	5.6 mm	4.2	
Upper Incisor Inclination	26.4	27.1	
Upper Incisor Vertical	mm	0.6	
Lower Incisor Protrusions	0.9 mm	1.8	
Lower Incisor Inclination	22.3	25.2	
Upper Molar Position	21.0 mm	21.2	
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)		10.6	
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane		10.6 12.8	
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO)	 40.9 mm	10.6 12.8 30.9	1-*
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee	 40.9 mm mm	10.6 12.8 30.9 73.9	1-*
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure	 40.9 mm mm 0.0 mm	10.6 12.8 30.9 73.9 -2.1	1-*
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance	 40.9 mm mm 0.0 mm -1.4 mm	10.6 12.8 30.9 73.9 -2.1 -4.9	1-*
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement	 40.9 mm mm 0.0 mm -1.4 mm Norm	10.6 12.8 30.9 73.9 -2.1 -4.9 Value	1-*
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2 24.4	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2 24.4 27.1	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2 24.4 27.1 31.2	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP)	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2 24.4 27.1 31.2	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP) Relative Anterior Guidance	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2 24.4 27.1 31.2	1-* Trend
Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement Sagittal Condylar Inclination right Sagittal Condylar Inclination left Sagittal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP) Relative Anterior Guidance Aesthetic Measurement	 40.9 mm mm 0.0 mm -1.4 mm Norm 	10.6 12.8 30.9 73.9 -2.1 -4.9 Value 46.6 47.0 46.8 36.2 24.4 27.1 31.2 Value	1-* Trend

Important:

- \blacktriangleright Lower facial height increased.
- \triangleright OPI = 10 degrees.
- \triangleright SCI R=L= 47 degrees.
- ➢ Interincisal angle- 127 degrees.

- ➤ Anterior Guidance 57 degrees.
- \blacktriangleright DOA R= 7 degrees.
- \blacktriangleright DOA L= -3 degrees.
- ➤ Maxilla position retrognatic.
- ➤ Mandibule position retrognatic.
- Dental class I right and III left side.
- Cross bite.

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is dolichofacial.

The skeletal trend of the mandible is extremely dolichofacial Skeletal class is III with tends to I.

The maxilla is positioned retrognatic.

The mandible is positioned neutral, with tendency to retrognatic.

The lower facial height is increased.

Dental class unknown.

The protrusion of the upper incisor is normal.

The inclination of the upper incisor is normal.

The protrusion of the incisor is normal.

The inclination of the lower incisor is normal.

The interincisal angle is normal.

Occlusal concept: Tendency to group function.

Explanation

Table 6

Determinants	Norm	Value	Trend
Facial Axis	90.0	83.2	2D**
Facial Depth	91.5	90.0	
Facial Taper	68.0	63.1	1D*
Mandibular Plane	21.5	26.7	1D*
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	401.7	2+**
Facial Length Ratio	63.5%	72.2	4+***>
Y Axis to S N	67.0°	73.3	2+**
Y Axis (Downs)	61.8	59.5	
S N to Gonion Gnathion Angle	31.6	41.7	2+**

Casts are mounted in the articulator in RP with plastic template after first condilography with braces on teeth.

Casts mounted in articulator in Reference position.

Treatment objectives:

- Determine Vertical dimension.
- ➢ Determine OPI and AG.
- ➢ Determine CR.
- Create Posterior support.
- ➢ Mouth hygiene parodontal treatment.
- \succ Retrusive control.

Treatment plan:

- 1. CR determination.
- 2. WAX-UP.
- 3. LONG TIME TEMPORARIES.
- 4. FINAL RESTORATIONS.

Casts mounted in articulator.

- ➢ NO posterior support.
- ▶ 41-31 are inclined lingually.
- \succ upper frontal incisors are inclined palatally.
- ▶ Interference 28-38.
- \triangleright No retrusive control.

21 - anterior guidance on lower 1/3 of 21. The length of the path -1 mm. Canine guidance - 3 mm both sie on mesial path.

Anterior Guidance – 57 degrees to AOP – (axis orbital plane).

OPI R = 10, OPI L= 20.

Articulator settings (Function)

Important

Lower facial height – increased.

OPI R = 10 degrees.

OPI L -10 degrees (increase VD +1 mm) and increase the length of 31-41

+2 mm. At the same time decrease the length of 36 and 46 for 2 mm

OPI 36 and 46 = 6 degrees SCI R=L= 47 degrees.

Interincisal angle - 127 degrees Anterior Guidance – 57 degrees Maxilla position – retrognatic.

Mandibule position – retrognatic Dental class I.

Cross bite left side.

Aesthetic analysis

Face Profile

F and S sound – rotational component.

VIDEOS OF PATIENT	
Right lateral view of "F" Sound	6
Left lateral view of "F" Sound	G
Natural smile	۵
"S" Sound	
Natural rest position	

VIDEOS OF PATIENT

Right lateral view of "F" Sound	0
Left lateral view of "F" Sound	6
Natural smile	0
"S" Sound	
Natural rest position	

ESTHETIC INFORMATION	
HIGHLY DEMANDING PATIENT	Yes
ALIGMENT	No set
APPEARANCE	Young
ТООТН ТҮРЕ	Ovoid
MACRO TEXTURE	Slight
COLOR CHARACTERIZATION	Wide and uniform
SMILE LINE	Average
The visibillity o the anterior teeth suggest y	Nime.
LABIAL CORRIDOR	Absent
Decrease the buccal volume of the posteri	
SMILE WIDTH	6-8
INTERINCISAL LINE INCLINATION	Vertical
Missing information.	

COLOR SELECTION	
SHADE GUIDE	
DESIRED COLOR OF THE RESTORATION	A2
Value	High 🛛 🔘 🜑 🜑 Low
ABUTMENT COLOR	

FUNCTIONAL INFORMATION	
ORIGINAL OVERBITE	0.1
FINAL OVERBITE	1.1
ORIGINAL OVERJET	0.1
FINAL OVERJET	1
VDO ALTERATION	0
ARTICULATOR	Fully-adjustable
IMMEDIATE BENNETT	Custom
BENNETT ANGLE	Custom
CONDYLAR EMINANCE ANGLE	Custom
DISOCCLUSION	Canine-guide,Incisal guidance
FACEBOW	arbitary

ORIGINAL LENC	TH OF THE REFERENCE CENTRAL INCISOR	1 2mm
change length		-0.2mm
ORIGINAL WIDT	H OF THE REFERENCE CENTRAL INCISOR	0.2mm
change width		0mm
		0
	200000C	
	20000000	
ORIGINAL LENG	TH OF THE REFERENCE CENTRAL INCISOR	1mm
ORIGINAL LENC change length	TH OF THE REFERENCE CENTRAL INCISOR	1mm Omm
ORIGINAL LENG change length ORIGINALWIDT	TH OF THE REFERENCE CENTRAL INCISOR	1mm 0mm 0.7mm

Esthetic:

- > +2 mm lower incisors.
- > +2 mm upper incisors.
- ≻ VD +1 mm.
- Central line is shifted left.
- Change inclination of upper and lower incisors.

Wax up

Wax up

Mock-up

Teeth preparation

Finding Final-Diagnostics

Table 11

Spe	Special Medical Analysis						
Do	Do you have or did ever have an illness with regard to point 1-12?						
		Yes	No				
1.	Infections		Х				
2.	Cardo-vascular systems		Х				
3.	Respiratory systems		Х				
4.	Digestive system		Х				
5.	Metabolic system		Х				
6.	Allergies	Х					
7.	Urogenital problems		Х				
8.	Central nervous system		Х				
9.	Psychological problems (therapy)		Х				
10.	Rheumatic disease		Х				
11.	Hormonal disease		Х				
12.	Special problms		X				
Mai	n concern: aesthetic, low chewing efficacy						

			Valuation	Yes	No	
tal History	Analysis					
Do you hav	e problei	ns when you	chew?			X
Do you hav	e problei	ns when you	are talking?			Х
Do you hav	e problei	ns in closing	you teeth			X
Are any of	your teet	h especially s	sensitive?			X
Do you hav mouth very wide?	e problei	n when you o	open your			X
Do you jaw	[,] joints no	pise and if so	, on what side?			X
Do you hav	e pain in	the area of y	our jaw joints?			Х
Do you suf	fer from l	headaches?				Х
Do you suffer from cramps or spas in your head, neck or throat?						
Do you hav posture?	e in gene	eral problems	with your			X
			Occlusal Index	0.00		
Have you e	ver had s	erious accide	ent?			X
Did you ha	ve one or	more oral in	tubations?			X
Have you e	ver had c	orthodontic tr	eatment or			X
Have you h	ad a treat	tment with sp	olint?			X
Are you gri	nding or	pressing with	n your teeth?			X
Do you thir	nk that tre	eatment is ne	cessary?			X
Do you thir illness?	nk that is	a serious dise			X	
When the la	ast time y	ou had denta	l treatment and	what was done?		·
How would	l you des	cribe your ps	ychic behavior?			
happy X	sad	calm	excited	self-controlled	lack of sel	t-control
	tal HistoryDo you havDo you havDo you havDo you havproperty?Are any ofDo you you havmouth verywide?Do you jawDo you jawDo you suffDo you havposture?Have you eHave you haveHave you fillDo you thirDo you thirDo you thirDo you thirHave you fillHave you thirHow wouldhappyX	tal History AnalysisDo you have problemDo you have problemDo you have problemDo you have problemproperty?Are any of your teetDo you have problemmouth verywide?Do you jaw joints notDo you jaw joints notDo you suffer fromDo you suffer fromDo you suffer fromDo you suffer fromDo you have in geneposture?Have you ever had sDid you have one orHave you ever had a treatAre you grinding orDo you think that isillness?When the last time yHow would you desehappysadX	tal History AnalysisDo you have problems when youDo you have problems when youDo you have problems in closing property?Are any of your teeth especially sDo you have problem when you o mouth very wide?Do you jaw joints noise and if so.Do you have pain in the area of yDo you suffer from headaches?Do you suffer from cramps or spaneck or throat?Do you have one or more oral in Have you ever had serious accideDid you have one or more oral in Have you ever had orthodontic tr Have you grinding or pressing with Do you think that treatment is need Do you think that is a serious disc illness?How would you describe your ps happySadCalmX	tal History AnalysisDo you have problems when you chew?Do you have problems when you are talking?Do you have problems in closing you teethproperty?Are any of your teeth especially sensitive?Do you have problem when you open yourmouth verywide?Do you jaw joints noise and if so, on what side?Do you ave pain in the area of your jaw joints?Do you suffer from headaches?Do you suffer from cramps or spas in your head,neckor throat?Do you have in general problems with yourposture?Occlusal IndexHave you ever had serious accident?Did you have one or more oral intubations?Have you ever had orthodontic treatment orHave you grinding or pressing with your teeth?Do you think that treatment is necessary?Do you think that is a serious disorder orillness?When the last time you had dental treatment andHow would you describe your psychic behavior?happysadcalmexcitedX	Valuationtal History AnalysisDo you have problems when you chew?Do you have problems when you are talking?Do you have problems in closing you teeth property?Are any of your teeth especially sensitive?Do you have problem when you open your mouth very wide?Do you jaw joints noise and if so, on what side?Do you suffer from headaches?Do you suffer from cramps or spas in your head, neck or throat?Do you have one or more oral intubations?Have you ever had serious accident?Did you have one or more oral intubations?Have you ever had orthodontic treatment orHave you grinding or pressing with your teeth?Do you think that treatment is necessary?Do you think that is a serious disorder or illness?How would you describe your psychic behavior?happysadcalmexcitedself-controlledX	ValuationYestal History AnalysisDo you have problems when you chew?Do you have problems when you are talking?Do you have problems when you are talking?Do you have problems in closing you teeth property?Po you have problems in closing you teeth property?Are any of your teeth especially sensitive?Do you have problem when you open your mouth very wide?Po you jaw joints noise and if so, on what side?Do you jaw joints noise and if so, on what side?Do you suffer from headaches?Po you suffer from cramps or spas in your head, neck or throat?Do you usuffer from cramps or spas in your head, neckCoclusal IndexPo youDo you have one or more oral intubations?Po you have one or more oral intubations?Po you have you ever had serious accident?Did you have one or more oral intubations?Po you think that treatment with splint?Po you think that treatment is necessary?Po you think that is a serious disorder or illness?How would you describe your psychic behavior? happySadcalmexcitedself-controlledAre youlack of selfSelf-controlledlack of self

Prelin	ninary Brainstem Nerve Analysis
1.	N. olfactorious (analysis)
2.	N. opticus (analysis)
3.	N. occulo-motorius (clinical mobility)
4.	N. trochlearis (clinical mobility)
5.	N. trigeminus (clinical palpation and sensitiveness)
6.	N. abducens (clinical mobility)
7.	N. facials (clinical mobility)
8.	N. stato-acusticus (clinical check of the equilibrim and hearing)
9.	N. glosso-pharyngeus (clinical and analysis)
10.	N. vagus (analysis)
11.	N. accessories (clinical and analysis)
12.	N.hypoglossus (clinical and analysis)

		Right		Left	
Mu	scle Diagnosis	+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipitalal region				
3.a	M. temporalis ant.				
3.b	M. temporalis med.				
3.c	M. temporalis post.				
4.a	M. masseter (superficialis)				
4.b	M. masseter (deep)				
5.	Tuber maxillae				
6.	M. pterygoideus medialis				
7.	M. mylohyideus				
8.	M. digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M. sterno-cleido-mastoideus				
13.	M. omohyoideus				
14.	Tongue				
	Comparative palpation of jaw joints				
	a) Lateral poles, statically				
	b) Lateral poles, in rotation				
	c) Retral joint space				
15.	d) Lig. temporo- mandibulare				
Ligament and capsule, TMJ position					

Final Restorations

Clinical case №11

Patient L (date of birth 11/01/1954)

Date of examination: 03.06.2021

- Violation of chewing function.
- ➢ Aesthetic problem.
- > Hypersensitivity of the teeth.
- \succ Problems with speech.

Smile line

Intraoral picture June 2021.

Dental class I with tendancy to III.

Diagnostic cast of the upper jaw.

Diagnostic cast of the lower jaw.

Medical Analyses and Dental Analyses

Special Medical Analyses

Table 1

Spe	Special Medical Analysis						
Do	Do you have or did ever have an illness with regard to point 1-12?						
		Yes	No				
1.	Infections		Х				
2.	Cardo-vascular systems	Х					
3.	Respiratory systems		Х				
4.	Digestive system		Х				
5.	Metabolic system	Х					
6.	Allergies	Х					
7.	Urogenital problems	Х					
8.	Central nervous system		Х				
9.	Psychological problems (therapy)		Х				
10.	Rheumatic disease		Х				
11.	Hormonal disease	Х					
12.	Special problms	Х					
Ma	in concern: aesthetic, low chewing efficacy						

		Valuation	Yes	No
Den	tal History Analysis			
1.	Do you have problems when you chew?	3	Х	
2.	Do you have problems when you are talking?	2	Х	
3.	Do you have problems in closing you teeth property?			X
4.	Are any of your teeth especially sensitive?	2	X	
5.	Do you have problem when you open your			Х
	mouth very wide?			
6.	Do you jaw joints noise and if so, on what side?			Х
7.	Do you have pain in the area of your jaw joints?			Х
8.	Do you suffer from headaches?	2	Х	
9.	Do you suffer from cramps or spas in your head,			Х
	neck			
10	Of throat?			V
10.	posture?			Δ
	Occlusal Index	2.25		
11.	Have you ever had serious accident?			Х
12.	Did you have one or more oral intubations?			Х
13.	Have you ever had orthodontic treatment or			Х
14.	Have you had a treatment with splint?			Х
15.	Are you grinding or pressing with your teeth?			Х
16.	Do you think that treatment is necessary?			Х

17.	Do you thin illness?	nk that is	a serious disc	order or			Х	
18.	When the la	ast time y	ou had denta	l treatment and	what was done?			
	May 2021 operation implantation							
19.	How would you describe your psychic behavior?							
	happy	sad	calm	excited	self-controlled	lack of self-	control	
					X			

Prelin	ninary Brainstem Nerve Analysis
1.	N. olfactorious (analysis)
2.	N. opticus (analysis)
3.	N. occulo-motorius (clinical mobility)
4.	N. trochlearis (clinical mobility)
5.	N. trigeminus (clinical palpation and sensitiveness)
6.	N. abducens (clinical mobility)
7.	N. facials (clinical mobility)
8.	N. stato-acusticus (clinical check of the equilibrim and hearing)
9.	N. glosso-pharyngeus (clinical and analysis)
10.	N. vagus (analysis)
11.	N. accessories (clinical and analysis)
12.	N.hypoglossus (clinical and analysis)

		Right		Left	
		+	++	+	++
Mu	scle Diagnosis				
1.	Shoulders and neck				
2.	Atlanto-occipitalal region				
3.a	M. temporalis ant.				
3.b	M. temporalis med.				
3.c	M. temporalis post.				
4.a	M. masseter (superficialis)				
4.b	M. masseter (deep)				
5.	Tuber maxillae			Х	
6.	M. pterygoideus medialis		Х		Х
7.	M. mylohyideus				
8.	M. digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M. sterno-cleido-mastoideus				
13.	M. omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw joints				
	*				V
	a) Lateral poles, statically				A
	b) Lateral poles, in rotation				Х
	c) Retral joint space				
	d) Lig. temporo-mandibulare				X
	 Ligament and capsule, TMJ positi 	on			

Muscle palpation

Movement Muscles

Posture - 1, 2, 7, 12, 13, 14

Closing - 3a, 3b, 4a, 4b, 5

Opening / Protraction - 8, 9, 10

Retraction 3c, 8

Medio-/Laterotraction - 6, 3a, 4a

Hyoid-Position - 8, 9, 10, 11, 13

Functions - 7, 8, 9, 10, 11, 14

TMJ - 15a, 15b, 15c, 15d
Closing, Medio-/Laterotraction, TMJ

List of problem:

- ➢ No posterior support.
- ➢ No retrusive control.
- \succ No anterior guidance.
- ➢ Gum recession.
- \succ Esthetics.
- ➢ No chewing efficacy.

Treatment objectives:

- Determine OPI and AG.
- ➢ Determine CR.
- Create Posterior support.
- \succ Root canal treatment 22.
- \succ Prosthetic on implants.
- ➢ Retrusive control.

Results of condylography

Protrusion/retrusion (left)



Ligament problems Gamma rotation – norm



Mediotrusion (right)



Mediotrusion (left)



Negative Bennett movement – disc adhesion, Open-close



Loop of digastric muscle at the open – during speech

Speech 50-60

Interference in frontal area and backward movement

Mastication



Protrusive component and absence of lateral movement Brux



Pure rotation during bruxing Speech 50-60



Resurtrusion. Interference on canines and anterior Frontal teeth? Disc adhesion?

Hinge axis kinematic vs Arbitrary



Lateral X ray



OPG



Cephalometric Analysis



Slavicek Analysis			
Skoletal Maasurament	Norm	Value	Trond
Skeletal Measurement	Norm	value	Trena
Facial Axis	90.0°	95.9	1B*
Facial Depth	89.0°	94.1	1+*
Mandibular Plane	24.0°	18.9	1B*
Facial Taper	68.0 [°]	66.9	
Mandibular Arc	29.0 [°]	35.7	1B*
Maxillary Position	65.0 [°]	64.7	
Convexity	0.0 mm	-2.6	1V*
Lower Facial Height (by R. Slavicek)	43.7	41.8	
Lower Facial Height to Point D	50.3	45.2	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8 [°]	127.5	
Upper Incisor Protrusion	4.3 mm	2.2	
Upper Incisor Inclination	23.1 [°]	15.0	1-*
Upper Incisor Vertical	mm	0.1	
Lower Incisor Protrusions	1.2 mm	-0.9	

Lower Incisor Inclination	24.1 [°]	37.3	1+*
Upper Molar Position	18.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)	°	7.5	
Idealized Occlusal Plane – Axis Orbital Plane		11.3	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	34.0	
Radius of Curve of Spee	mm	45.9	
Lip Emrasure	0.0 mm	-2.4	
Occlusal Plane Xi Distance	-1.4 mm	-6.8	1-*
Functional Measurement	Norm	Value	Trend
Sagittal Condylar Inclination right	• 	42.7	
Sagittal Condylar Inclination left	• 	47.1	
Sagittal Condylar Inclination	• 	44.9	
Relative Condylar Inclination		37.4	
Relative Condylar Inclination 6	• 	39.2	
Relative Condylar Inclination 7	¢		
Relative Condylar Inclination 8	0		
Anterior Guidance (S-AOP)	٥		
Relative Anterior Guidance	0		
Aesthetic Measurement	Norm	Value	Trend
Aesthetic Plane	-2.3 mm	-4.3	1-*

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is brachyfacial.

The skeletal trend of the mandible is brachyfacial Skeletal class is III with tends to I.

The maxilla is positioned neutral.

The mandible is positioned prognathic.

The lower facial height is normal Dental class unknown.

The protrusion of the upper incisor is normal.

The inclination of the upper incisor is diminished.

The protrusion of the incisor is normal.

The inclination of the lower incisor is increased.

The interincisal angle is normal.

Occlusal concept: Unknown (data missing).

Explanation

Determinants	Norm	Value	Trend
Facial Axis	90.0	95.9	1B*
Facial Depth	89.0	94.1	1+*
Facial Taper	68.0	66.9	
Mandibular Plane	24.0°	18.9	1B*
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	386.0	3-***
Facial Length Ratio	63.5%	71.5	4+***>
Y Axis to S N	67.0°	64.3	
Y Axis (Downs)	61.2	55.0	2-**
S N to Gonion Gnathion Angle	32.6	26.0	1-**

Casts are mounted in the articulator in RP with plastic template after condilography.



Treatment plan:

- ➢ CR determination
- ≻ WAX-UP
- LONG TIME TEMPORARIES and implants loading

> FINAL RESTORATIONS

OPI R = 6,5, OPI L= 5.



Articulator settings

- Lower facial height normal.
- OPI R = 6 degrees.
- OPI L = 6 degrees (increase VD +2 mm).
- SCI R=L= 47 degrees.
- Anterior Guidance =57 degrees.
- DOA R=10 degrees.
- DOA L= 10 degrees Maxilla position neutral.

Mandibule position – prognatic Dental class I right and I left side.



Esthetic analyses

Face Profile



F and S sound – rotational component.

0
0
0



M2000000	No contacts

Table 8

ESTHETIC IN	IFORMATION
HIGHLY DEMANDING PATIENT	Yes
ALIGMENT	No set
APPEARANCE	Middle age
ТООТН ТҮРЕ	Ovoid
MACRO TEXTURE	Sliht
COLOR CHARACTERIZATION	Tesature
SMILE LINE	Low
	No candi der
LABIAL CORRIDOR	Absent
Decrease the buccal volume of the posterier SMILE WIDTH	10
INTERINCISAL LINE INCLINATION	Vertical
Missing information.	
OCCLUSAL PLANE ORIENTATION	
Missing information. INCISAL EDGE POSITION	The second se
convex	

	14010
COLOR SELECTION	
SHADE GUIDE	
DESIRED COLOR OF THE RESTORATION	A1
Value	High 🔘 🔍 🔍 💭 Low
ABUTMENT COLOR	·



FUNCTIONAL INFORMATION	
ORIGINAL OVERBITE	0.2
FINAL OVERBITE	0.2
ORIGINAL OVERJET	5
FINAL OVERJET	5,7
VDO ALTERATION	0
ARTICULATOR	Fully-adjustable
IMMEDIATE BENNETT	Custom
BENNETT ANGLE	Custom
CONDYLAR EMINANCE ANGLE	Custom
DISOCCLUSION	
FACEBOW	

Wax up



Silicone keys for Mock up.



Photos after the preparation of teeth.



Abutment teeth color



Final impressions



Final work on the upper jaw cast





Final work on the lower jaw cast



Cast of the prepared teeth of the upper jaw



Cast of the prepared the eth of the lower jaw



Final work 1.07.2021 (immediately after fixing)



Clinical case №12

Patient A date of birth: 16.01.1968

Date of examination: 15.02.2010

Chief complain – chipping of ceramic restorations.

After the last prostodontic treatment the mandible was shifted backward and appeared muscle tension in the neck. Swimming helped to solve this problem.

Table 1

Spe	Special Medical Analysis			
Do you have or did ever have an illness with regard to point 1-12?				
		Yes	No	
1.	Infections		Х	
2.	Cardo-vascular systems		Х	
3.	Respiratory systems		Х	
4.	Digestive system		Х	
5.	Metabolic system		Х	
6.	Allergies		Х	
7.	Urogenital problems		Х	
8.	Central nervous system		Х	
9.	Psychological problems (therapy)		Х	
10.	Rheumatic disease		Х	
11.	Hormonal disease		Х	
12.	Special problms		Х	
Main concern: aesthetic, low chewing efficacy				

		Right		Left	
		+	++	+	++
Mu	scle Diagnosis				
1.	Shoulders and neck				
2.	Atlanto-occipitalal region				
3.a	M. temporalis ant.				
3.b	M. temporalis med.				
3.c	M. temporalis post.				
4.a	M. masseter (superficialis)				
4.b	M. masseter (deep)			Х	
5.	Tuber maxillae			Х	
6.	M. pterygoideus medialis				Х

7.	M. mylohyideus			Х	
8.	M. digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M. sterno-cleido-mastoideus				
13.	M. omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw joints				
	a. Lateral poles, statically				
	b. Lateral poles, in rotation			Х	
	c. Retral joint space		Х		Х
	d. Lig. temporo-mandibulare			Х	
	Ligament and capsule, TMJ position				

Table 3

Sets of muscles:		
Muscle palpation		
Posture	1,2, 7, 12, 13, 14	
Closing	3a, 3b, 4a, 4b, 5	
Opening / Protraction	8, 9, 10	
Retraction	3c, 8	
Medio-/Laterotraction	<mark>6</mark> , 3a, 4a	
Hyoid-Position	8, 9, 10, 11, 13	
Functions	7, 8, 9,10, 11, 14	
TMJ	15 a, 15b, 15c, 15d	
Closing, Medio-/Laterotraction, Functions, TMJ		

Intraoral picture



Mandible shifts to the right?



I class





Casts before treatment





Ceramic chipping

Steep canines cause chipping ceramic in molar region and no posterior support, palatal inclined incisors.



Grinding facets, chipping of ceramic.



Periodontal status

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OPG after teeth extraction. We made endodontic treatment of all the teeth of upper jaw and cores and temporaries 17.08.2010. Some teeth of upper 17,14 and lower jaw -37,38, 46,47, were extracted because of root canal problems and inflammation.



After tooth extraction new casts with new temporary crowns on the upper jaw. Casts were remounted in RP 17.08.2010.





CR



Occlusal plane



Condylography before splint -therapy



Medoitrusion right before splint-therapy



Mediotrusion left before splint -therapy



Open - close before splint -therapy



Brux- protrusion before splint -therapy



Speech- Protrusion before 1-st splint -therapy



Distruction during speech

CPM before splint -therapy



Mastication



Lateral X-ray 17.08.2010.

Before splint.





Table 4

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	91.5	
Facial Depth	91.5	94.1	
Mandibular Plane	21.5	17.0	1 B *
Facial Taper	68.0	68.7	
Mandibular Arc	31.2	48.9	4B***>

Maxillary Position	65.0°	63.0	
Convexity	-1.0 mm	-4.6	1V*
Lower Facial Height (by R. Slavicek)	43.1°	41.1	
Lower Facial Height to Point D	49.6	45.4	1-*
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.7	135.5	
Upper Incisor Protrusion	3.7 mm	3.4	
Upper Incisor Inclination	24.0	15.9	1-*
Upper Incisor Vertical	mm	0.4	
Lower Incisor Protrusions	2.7 mm	0.5	
Lower Incisor Inclination	24.0	28.5	
Upper Molar Position	21.0 mm		
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)		2.1	
Idealized Occlusal Plane – Axis Orbital Plane		3.2	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	47.8	
Radius of Curve of Spee	mm	59.2	
Lip Emrasure	0.0 mm	1.7	
Occlusal Plane Xi Distance	-1.4 mm	0.2	
Functional Measurement	Norm	Value	Trend
Sagittal Condylar Inclination right		39.2	
Sagittal Condylar Inclination left		43.8	
Sagittal Condylar Inclination		41.5	
Relative Condylar Inclination		39.4	
Relative Condylar Inclination 6		40.6	
Relative Condylar Inclination 7	°	31.0	
Relative Condylar Inclination 8	[°]	16.2	
Anterior Guidance (S-AOP)	0		
Relative Anterior Guidance			
Aesthetic Measurement	Norm	Value	Trend
Aesthetic Plane	-2.9mm	-7.5	2-**

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is extremely brachyfacial Skeletal class

is III with tends to I.

The maxilla is positioned neutral.

The mandible is positioned neutral, with tendency to prognatic.

The lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is normal.

The inclination of the upper incisor is diminished.

The protrusion of the incisor is normal

The inclination of the lower incisor is normal.

The interincisal angle is normal.

Occlusal concept: Unknown (data missing).

No functional statement available.

Table 5

Determinants	Norm	Value	Trend
Facial Axis	90.0°	91.5	
Facial Depth	91.S	94.1	
Facial Taper	68.0°	68.7	
Mandibular Plane	21.5	17.0	1B*
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	386.1	3-***
Facial Length Ratio	63.5%	71.8	4+***>
Y Axis to S N	67.0°	68.2	
Y Axis (Downs)	61.8	55.4	2-**
S N to Gonion Gnathion Angle	31.6	26.1	1-*

Splint-therapy: +4 mm verticalization.



Casts after splint therapy in MPI both condyles distraction on Z axis for 2 mm.



Before



Before may be medially displaced disc or disc adhesion-



Muscles avoide interference before


Overrotation

Overlay protrusion-retrusion and Open-close before splint-therapy



Articulator settings





Comparison of dates:

- ➢ SCI right 39.
- ≻ SCI left 43.
- ≻ LFH 41,1.
- ≻ OPI 2,1.
- ≻ DOA 9.
- Skeletal class III with tend to I.
- ➤ Asimmetrical case wax with setting for right and left side
- ≻ I class.
- Occlusal concept Sequential guidance.
- LFH +3 mm on incisal pin increase vertical dimension increase 2 mm lower s and 1 mm upper.

- OPI right side minus 1 degree.
- ➢ OPI left side − plus 5 degree.
- SCI right 39 degree left black insert.
- SCI left 45 degrees right blue insert.
- Bennett right 0 white.
- ➢ Bennett left 13 white.
- ➤ Incisal table green- frontal part, both sides —blue.
- AG It should be 10 degrees higher than SCI for right side 49 degree and for left side – 55 degrees.
- It should be done bone unloading bilaminar zone, not eliminate compression.Compression means bone to bone contacts.
- After 1-st splint therapy grinding the mandible moved forward and up – it means the condyle moved backward and downward. - cranial movement.
- Mastication centre is on the right side is down- avoidance pattern
- Speech avoiding pattern- 2 mm downward on z axis in compare to protrusion-retrusion movement.
- Protrusion musles problem m.pterygoideus medialis and lateralis
- Hyoid bone problems hyoid goes downward and musles of hyoid bone goes than to clacicula.
- Patients with Parkinsons desease. It is difficult to determine for them protrusion-retrusion and mediotrusion. Ask the patient to move the mandible in free movement. The most cranial is a close to eminence is choosen like protrusion. Also, in operated joint the patient has a guidance and SCI.
- Curve of Spee is only a lateral segment and include only 34, 35, 36,

37. For curve of Spee.

- determination we need 3 points: axis, OPI6, not perpendicular to 41. It was the original article from Ortlieb and this theory is old. Perpendiculars are to tooth 6. In full dentures to 6 and 1 lowers OPI 6 is a secante to Curve of Spee. In determination of curve of Spee we don't use CANINES.
- \blacktriangleright We should make occlusal tables for 4,5,6,7.



Wax up





January 2011 permanent temporary crowns for implantation.



On March 1, an implantation operation was performed on the upper and lower jaw and the incisal canal cyst was removed.



OPG



Clinical case №13

Patient A date of birth: 07.08.1969

Chief complain: chipping ceramic restorations, breakage of restorations OPG 2008.



Clinical functional analyses

Table 1

Spe	Special Medical Analysis								
Do you have or did ever have an illness with regard to point 1-12?									
		Yes	No						
1.	Infections		Х						
2.	Cardo-vascular systems		Х						
3.	Respiratory systems		Х						
4.	Digestive system		Х						
5.	Metabolic system		Х						
6.	Allergies		Х						
7.	Urogenital problems		Х						
8.	Central nervous system		Х						
9.	Psychological problems (therapy)		Х						
10.	Rheumatic disease		Х						
11.	Hormonal disease		Х						
12.	Special problms		Х						
Mai	Main concern: aesthetic, low chewing efficacy								

Table 2

					Valuation	Yes	No
Den	tal History	Analysis					
1.	Do you hav	ve problei	ns when you	2	X		
2.	Do you hav	ve problei	ns when you			X	
3.	Do you hav	ve problei	ns in closing	g you teeth	2	X	
1	property?	voue toot	h acreatelly	a an aitima 9			V
4.	Are any or	your teet	n especially	sensitive?			<u>Λ</u>
5.	Do you hav	ve problei	n when you	open your			X
	mouth very	7					
6	Do you jaw	v ioints no	oise and if so	on what side?			X
7	Do you hay	ve nain in	the area of	your jaw joints?			X
8	Do you suf	fer from	headaches?	1	X		
0.	Do you suf	for from		1		V	
9.	DO you sui		cramps of sp	as in your nead,			Λ
	or throat?						
10.	Do you hav	ve in gene	ral problem	s with your	1	X	
	posture?	U	-	-			
				Occlusal Index	1.50		
11.	Have you e	ever had s	erious accid	ent?			X
12.	Did you ha	ve one or	more oral in	ntubations?			X
13.	Have you e	ever had c	orthodontic t	reatment or			X
14.	Have you h	ad a treat	tment with s	plint?			X
15.	Are you gri	inding or	pressing wit	h your teeth?		X	
16.	Do you thin	nk that tre	eatment is ne	ecessary?		X	
17.	Do you thin	nk that is	a serious dis	order or		X	
10	illness?		1 1 1 .	1 1			
18.	When the la	ast time y	ou had dent	al treatment and	what was done?		
10	11 1	1 1	.1	1.1.1			
19.	How would	i you des	cribe your pa	sychic behavior?		1	16 t 1
	happy	sad	calm	excited	self-controlled	lack of se	II-control

Table 3

Prelin	ninary Brainstem Nerve Analysis
1.	N. olfactorious (analysis)
2.	N. opticus (analysis)
3.	N. occulo-motorius (clinical mobility)
4.	N. trochlearis (clinical mobility)
5.	N. trigeminus (clinical palpation and sensitiveness)
6.	N. abducens (clinical mobility)
7.	N. facials (clinical mobility)
8.	N. stato-acusticus (clinical check of the equilibrim and hearing)
9.	N. glosso-pharyngeus (clinical and analysis)
10.	N. vagus (analysis)
11.	N. accessories (clinical and analysis)
12.	N.hypoglossus (clinical and analysis)



Table	4
-------	---

		Right		Left		
		+	++	+	++	
Mu	scle Diagnosis					
1.	Shoulders and neck					
2.	Atlanto-occipitalal region					
3.a	M. temporalis ant.					
3.b	M. temporalis med.					
3.c	M. temporalis post.					
4.a	M. masseter (superficialis)					
4.b	M. masseter (deep)					
5.	Tuber maxillae			Х		
6.	M. pterygoideus medialis		Х			
7.	M. mylohyideus					
8.	M. digastricus					
9.	Suprahyoidale M.					
10.	Infrahyoidale M.					
11.	Larynx					
12.	M. sterno-cleido-mastoideus					
13.	M. omohyoideus					
14.	Tongue					
15.	Comparative palpation of jaw joints					

e. Lateral poles, statically			
f. Lateral poles, in rotation			
g. Retral joint space			
h. Lig. temporo-mandibulare	Х	Х	
 Ligament and capsule, TMJ positi 	on		·

Table 5

Sets of muscles:	
Muscle palpation	
Posture	1,2, 7, 12, 13, 14
Closing	3a, 3b, 4a, 4b, 5
Opening / Protraction	8, 9, 10
Retraction	3c, 8
Medio-/Laterotraction	<mark>6</mark> , 3a, 4a
Hyoid-Position	8, 9, 10, 11, 13
Functions	7, 8, 9,10, 11, 14
TMJ	15 a, 15b, 15c, 15d
Closing, Medio-/Laterotraction, TMJ	

Intraoral photo



- ➢ Occlusal plane is flat.
- ➢ Overeruption of 27.
- ➤ Gingivitis.
- ➢ II class occlusion right and left side.



Position of lower incisors: to close to each other



Casts in RP

Difference between RP and I CP after diagnostic Grinding is -2 mm. In RP incisal pin= -1 degree. After grinding = -3 degrees



No posterior support

SCI is 59 degrees, OPI should be increased, it means that there is no place for 37 and 47.







Transversal and sagittal discrepancy of upper and lower jaw



MPI



Anterior Guidance



Anterior Guidance (S-AOP)		45.0	
Relative Anterior Guidance		35.4	
Esthetic Measurement (Lip Relation)	Norm	Value	Trend

OPI

OPI right and left side = 10 degrees



Lateral X-ray



OPG



Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is mesiofacial Skeletal class is II with tends to I.

The maxilla is positioned prognatic.

The mandible is positioned neutral, with tendency to prognatic.

The lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is normal.

The inclination of the upper incisor is diminished.

The protrusion of the incisor is normal

The inclination of the lower incisor is normal.

The interincisal angle is normal.

Occlusal concept: Tandency to group function.

No functional statement available.

Explanation

Table 1

Determinants	Norm	Value	Trend
Facial Axis	90.0°	93.9	1B*
Facial Depth	91.5	86.7	1-*
Facial Taper	68.0°	73.1	1B*
Mandibular Plane	21.5	20.1	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	380.0	6-***>
Facial Length Ratio	63.5%	76.2	6+***>
Y Axis to S N	67.0°	60.9	2-**
Y Axis (Downs)	61.8	59.0	
S N to Gonion Gnathion Angle	31.6	20.0	3-***

- ➤ SCI 59 degrees.
- ➢ Symmetrical case.
- \succ OPI should be 12 degrees.
- \triangleright OPI 6= 19 degrees.
- \blacktriangleright DOA 6= 10 degrees.



Incisal Pin Table

Table 2

Incisal Pin Height	0.0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
Lower Fadal Height	43.2	43.6	44.1	44.5	44.9	45.3	45.7	46.4	47.2	47.9	48.6	49.3	50.6
LFH (Norm)	43.2	43.3	43.4	43.5	43.7	43.8	43.9	44.1	44.3	44.5	44.7	44.9	45.3
LFH	0.0	0.4	0.9	1.3	1.7	2.1	2.5	3.2	4.0	4.7	5.4	6.1	7.4
(Variation)													
Menton Vertical	0.0	0.5	0.9	1.3	1.8	2.2	2.6	3.3	4.1	4.8	5.5	6.1	7.4
Pogonion Sagittal	0.0	-0.8	-1.7	-2.5	-3.3	-4.2	-5.0	-6.7	-8.4	-10.1	-11.8	-13.5	-16.9
Incision Inf.Vertical	0.0	0.5	1.1	1.6	2.1	2.6	3.1	4.0	5.0	5.9	6.7	7.6	9.2
Incision Inf. Sagittal	0.0	-0.6	-1.2	-1.8	-2.4	-3.0	-3.6	-4.8	-6.1	-7.4	-8.6	-9.9	-12.6

Table 3

Incisal Pin Height	0.0	-1.0	-2.0	-3.0	-4.0	-5.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0	-20.0
Lower Fadal Height	43.2	42.8	42.3	41.9	41.4	40.9	40.5	39.5	38.5	37.4	36.3	35.1	32.6
LFH (Norm)	43.2	43.1	43.0	42.9	42.8	42.7	42.6	42.4	42.2	41.9	41.7	41.5	41.1
LFH (Variation)	0.0	-0.4	-0.9	-1.3	-1.8	-2.3	-2.7	-3.7	-4.8	-5.8	-6.9	-8.1	-10.6
Menton Vertical	0.0	-0.5	-0.9	-1.4	-1.9	-2.4	-2.9	-4.0	-5.2	-6.3	-7.6	-8.9	-11.7
Pogonion Sagittal	0.0	0.8	1.6	2.5	3.3	4.1	4.9	6.4	8.0	9.5	11.0	12.4	15.2
Incision Inf.Vertical	0.0	-0.5	-1.1	-1.7	-2.2	-2.8	-3.4	-4.6	-5.9	-7.2	-8.6	-10.0	-13.0
Incision Inf. Sagittal	0.0	0.6	1.1	1.7	2.2	2.8	3.3	4.4	5.3	6.3	7.2	8.0	9.5

Table 4

Sato Analysis							
Denture frame analysis	Norm	Value	Trend				
FH-MP	25.9	18.0	1-*				
PP-MP	24.6	19.4	1-*				
OP-MP	13.2	7.3	1+*				
OP-MP/ PP-MP	54.0 %	38.0	1%*				
AB-MP	71.3	87.6	3+***				
A'-P'	50.0 mm	54.0					
A'-6'	23.0 mm	31.2	3+***				
A'-6'/ A'-P'	50.0 %	57.8					
U1-AB (degree)	31.7	25.6	1-*				
U1-AB (mm)	9.5 mm	6.9	1-*				
L1-AB (mm)	25.4	18.3	1-*				
L1-AB (mm)	6.2 mm	2.9	2-**				
Inter molar angle	174.0	168.0	1+*				
FH-PP	1.3	-1.3	2-**				
Kim analysis	Norm	Value	Trend				
ODI	72.0	86.7	2+**				
APDI	81.0	72.9	1+*				
Combination factor	153.0	159.2					
Downs-Graber analysis	Norm	Value	Trend				
Facial angle	85.1	86.2					
Convexity	-5.6	-5.1					
AB-Facial plane angle	-5.1	-12.4	2-**				
FH-MP	25.9	18.0	1-*				
Y Axis	65.7	58.7	2+**				
FH-OP	9.5	10.6					
Interincisal angle	129.7	135.9					
L1-OP	68.0	61.6	1+*				
L1-MP	94.7	105.9	1D*				
U1-A.POG	7.9 mm	2.9	2-**				

FH-SN	6.0	1.9	1+*
SNA Angle	81.9	87.3	1D*
SNB Angle	78.6	81.3	
ANB Angle	3.3	6.0	1D*
U1-Facial Plane (mm)	9.9 mm	4.3	1-*
U1-FH (deg)	108.9	99.9	1-*
U1-SN (deg)	103.1	98.0	
Gonial angle	119.4	115.4	
Ramus Inclination	2.6	7.3	1+*

Table 5

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0	93.9	1B*
Facial Depth	91.5	86.7	1-*
Mandibular Plane	21.5	20.1	
Facial Taper	68.0°	73.1	1B*
Mandibular Arc	31.2°	33.6	
Maxillary Position	65.0°	69.0	1+*
Convexity	-1.0 mm	2.4	1X*
Lower Facial Height (by R. Slavicek)	43.2	43.2	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8	135.9	
Upper Incisor Protrusion	4.3 mm	2.9	
Upper Incisor Inclination	23.1°	15.8	1-*
Upper Incisor Vertical	Mm	1.9	
Lower Incisor Protrusions	1.2 mm	-0.7	
Lower Incisor Inclination	24.1°	28.1	
Upper Molar Position	21.0 mm	14.0	3-***
Occlusal Plane	Norm	Value	Trend
Occlusal Plane – Axis Orbital Plane (Slavicek)		9.5	
Idealized Occlusal Plane – Axis Orbital Plane		11.9	
Distance Occlusal Plane – Axis (DPO)	40.9 mm	37.3	
Radius of Curve of Spee	mm	67.8	
Lip Emrasure	0.0 mm	1.3	
Occlusal Plane Xi Distance	-1.4 mm	-1.9	
Functional Measurement	Norm	Value	Trend
Sagittal Condylar Inclination right	[°]	57.8	
Sagittal Condylar Inclination left	[°]	60.0	
Sagittal Condylar Inclination		58.9	
Relative Condylar Inclination	°	49.4	
Relative Condylar Inclination 6	°	45.7	
Relative Condylar Inclination 7		32.9	
Relative Condylar Inclination 8	°	58.9	
Anterior Guidance (S-AOP)		45.0	
Relative Anterior Guidance		35.4	
Aesthetic Measurement	Norm	Value	Trend
Aesthetic Plane	-2.9mm	-3.8	
Lower Facial Height to Point D	49.7	44.3	1-*

Symmetrical case

SCI = 59 degrees right and left.

OPI total = 10 degrees change OPI 6 to 19 degrees both sides.

Or total OPI = 14 degrees and change OPI 6 to 19 degrees.

Now DOA= 19 degrees low chewing efficasy II dental class, deep bite.

Increase VD on incisal pin +4 mm.

Upper incisor inclination is decreased APDI= 72,9 class II tendency.





ODI= 86,2 deep bite tendancy.

VTO increase. VD+2 mm (IP=+1). VTO



Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	93.1	1B*
Facial Depth	91.5	86.2	1-*
Mandibular Plane	21.5	20.8	
Facial Taper	68.0°	72.9	1B*
Mandibular Arc	31.2°	33.4	
Maxillary Position	65.0°	69.0	1+*
Convexity	-1.0 mm	2.9	1X*
Lower Facial Height (by R. Slavicek)	43.5	44.0	
Lower Facial Height to Point D	50.0°	45.2	1-*
Dental Measurement	Norm	Value	Trend
Interincisal Angle	132.8	135.2	
Upper Incisor Protrusion	4.3 mm	3.3	
Upper Incisor Inclination	23.1	16.7	1-*
Upper Incisor Vertical	Mm	0.8	
Lower Incisor Protrusions	1.2 mm	-0.9	
Lower Incisor Inclination	24.1	27.9	
Upper Molar Position	21.0 mm	14.0	3-***
	NT	X 7 X	
Occlusal Plane	Norm	Value	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek)	Norm 	Value 10.3	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane	Norm 	Value 10.3 11.7	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO)	Norm 40.9 mm	Value 10.3 11.7 37.3	
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee	Norm 40.9 mm mm	Value 10.3 11.7 37.3 67.8	
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure	Norm 40.9 mm mm 0.0 mm	Value 10.3 11.7 37.3 67.8 0.1	
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance	Norm 40.9 mm mm 0.0 mm -1.4 mm	Value 10.3 11.7 37.3 67.8 0.1 -1.8	
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Emrasure Occlusal Plane Xi Distance Functional Measurement	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination right	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination left	Norm 40.9 mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar Inclination	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar Inclination	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar InclinationRelative Condylar Inclination 6	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar InclinationRelative Condylar Inclination 6Relative Condylar Inclination 7	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar InclinationRelative Condylar Inclination 6Relative Condylar Inclination 7Relative Condylar Inclination 8	Norm 40.9 mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value	Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar InclinationRelative Condylar Inclination 6Relative Condylar Inclination 7Relative Condylar Inclination 8Anterior Guidance (S-AOP)	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value 45.0	Trend Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar InclinationRelative Condylar Inclination 6Relative Condylar Inclination 7Relative Condylar Inclination 8Anterior Guidance (S-AOP)Relative Anterior Guidance	Norm 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value 45.0 35.4	Trend Trend Trend
Occlusal PlaneOcclusal Plane – Axis Orbital Plane (Slavicek)Idealized Occlusal Plane – Axis Orbital PlaneDistance Occlusal Plane – Axis (DPO)Radius of Curve of SpeeLip EmrasureOcclusal Plane Xi DistanceFunctional MeasurementSagittal Condylar Inclination rightSagittal Condylar Inclination leftSagittal Condylar InclinationRelative Condylar InclinationRelative Condylar Inclination 6Relative Condylar Inclination 7Relative Condylar Inclination 8Anterior Guidance (S-AOP)Relative Anterior GuidanceAesthetic Measurement	Norm 40.9 mm 0.0 mm -1.4 mm Norm Norm	Value 10.3 11.7 37.3 67.8 0.1 -1.8 Value 45.0 35.4 Value	Trend Trend

Protrusion- retrusion



Mediotrusion right



Mediotrusion left



Open- close



Brux



Speech 50-60



Mastication





- Increase VD for wax-up to 2 mm(Incisal pin = +1 mm) close the gap with upper incisors (VTO) Both jaws are in protruded position.
- ➢ II class occlusion.
- \triangleright OPI total = 12 degrees.
- \blacktriangleright OPI 6= 19 degrees.
- SCI left =59 degrees, black insert.
- SCI right= 59 degrees, black insert.
- > Bennett right = 0 degrees, white insert.
- > Bennett left = 13 degrees, white insert.
- ≻ AG 60 degrees.
- ➢ OPI stops on 36 and 47.
- Extract 18,17,47 and may be 17(from parodontal point of view no place for gingivotomy- distal root has a strong bone loss.

Photos before the treatment, after the removal of old orthopedic structures.



Wax



Wax up 05/09/2012





Photos of casts for temporary crowns.



Photos of temporary crowns.



Tooth 27: length 18 is sealed on 14. x-ray from April 2012.



OPG



Temporary crowns July 2012.



Templates for surgery 2012.







Periodontal chart 2012.



Trying on the operating template September 5, 2012.



OPG 12.11.2012



Photos of impression transfers 05/17/2013




OPG July 2013



Final restoration July 2013



Clinical case №14

Patient A date of birth.05.03.1950

Main concern: pain in right TMJ, no posterior support, acute pain in 44-45.

Intraoral photo



Canines and incisors are inclined palatal.



Cast mounted in intercaspal position.



Cast mounted in intercaspal position.



Cast mounted in intercaspal position.





Splint-therapy(myopathic splint).



Casts after splint-therapy.





Lateral X-ray.



OPG

Protrusion-Retrusion



Right side- muscle problems, reciprocal click, not reproducible Length of movement is decreased.

Translation-rotation



Negative rotation at the beginning of the movement- interference in frontal tooth.

Time curves (right side)



Time curves (left side)



Mediotrusion right



Negative Bennett movement.

Mediotrusion left



Negative Bennett movement.

Open-close



Translation-rotation



Protrusion- speech 60-70



Protrusion-brux



Articulator settings



Anterior guidance



OPI right and left



Cephalometry

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is mesiofacial Skeletal class is Iwith tends to II.

The maxilla is positioned strongly prognatic.

The mandible is positioned prognatic, with tendency to neutral.

The lower facial height is increased.

Dental class unknown.

The protrusion of the upper incisor is normal.

The inclination of the upper incisor is normal.

The protrusion of the incisor is normal.

The inclination of the lower incisor is normal.

The interincisal angle is normal.

Occlusal concept: Unknown (data missing).

No functional statement available.

Explanation

Table 1

Determinants	Norm	Value	Trend
Facial Axis	90.0°	91.8	
Facial Depth	89.0°	89.0	
Facial Taper	68.0°	64.5	
Mandibular Plane	24.0	26.3	
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	388.4	3-***
Facial Length Ratio	63.5%	69.7	3+***
Y Axis to S N	67.0°	65.9	
Y Axis (Downs)	61.2°	61.0	
S N to Gonion Gnathion Angle	32.6	28.4	1-*

Table 2

Slavicek Analysis					
Skeletal Measurement	Norm	Value	Trend		
Facial Axis	90.0	91.8			
Facial Depth	89.0°	89.0			
Mandibular Plane	24.0°	26.3			
Facial Taper	68.0°	64.5			
Mandibular Arc	29.0	31.9			
Maxillary Position	65.0°	69.3	1+*		
Convexity	0.0 mm	2.6	1X*		
Lower Facial Height (by R. Slavicek)	44.9°	52.3	1+*		
Lower Facial Height to Point D	51.4°	58.5	1+*		
Dental Measurement	Norm	Value	Trend		
Interincisal Angle	132.8	139.0			
Upper Incisor Protrusion	4.3 mm	2.1			
Upper Incisor Inclination	23.1°	19.0	1-*		
Upper Incisor Vertical	Mm				
Lower Incisor Protrusions	1.2 mm	-1.6			
Lower Incisor Inclination	24.1°	21.8			
Upper Molar Position	18.0 mm	27.6	4+***>		
Occlusal Plane	Norm	Value	Trend		
Occlusal Plane – Axis Orbital Plane (Slavicek)	[°]				
Idealized Occlusal Plane – Axis Orbital Plane		19.6			
Distance Occlusal Plane – Axis (DPO)	40.9 mm				
Radius of Curve of Spee	mm				
Lip Emrasure	0.0 mm				
Occlusal Plane Xi Distance	-1.4 mm				

Functional Measurement	Norm	Value	Trend
Sagittal Condylar Inclination right		49.9	
Sagittal Condylar Inclination left		46.1	
Sagittal Condylar Inclination		48.0	
Relative Condylar Inclination	[°]	48.0	
Relative Condylar Inclination 6	[°]	48.0	
Relative Condylar Inclination 7		48.0	
Relative Condylar Inclination 8		48.0	
Anterior Guidance (S-AOP)	[°]	75.9	
Relative Anterior Guidance	0		
Aesthetic Measurement	Norm	Value	Trend
Aesthetic Plane	-2.3mm	-5.9	1-*





VTO – cut 2 mm on incisor edge of 31,32,41,42,33,43.



Asymmetrical case:

- \blacktriangleright SCI R = 50 degrees.
- \blacktriangleright SCI L = 46 degrees.
- \triangleright OPI = 10 degrees.
- ➤ DOA R= 50-10=40-30 = 10 norm.
- > DOA L = 46-10=36-30 = 6 interference.
- \succ OPI l should be 6 degrees.
- ≻ LFH norm.

Treatment plan:

- 1. Myopatic splint therapy.
- 2. Wax-up.
- 3. Root canal retreatment 16,15,13,11,25,27.
- 4. Extract 24,17,47.
- 5. Place implants 14,11,14,16,35,36,37,44,45,46. Exact number of implants we can say only after wax-up.
- 6. Long time temporaries.

Technical specification:

- SCI R =50 degrees, black insert.
- \blacktriangleright SCI L = 46 degrees, yellow insert.
- > Bennett both sides- white inserts, = 0 degrees.
- \triangleright OPI R = 10 degrees.
- \blacktriangleright OPI L = 6 degrees.
- LFH no changes, but cut the hight of lower incisors for 2 mm, Frontal overbite and overjet after this cutting close with palatal surface (crowns) of upper frontal teeth.
- Smile line- right and left side different.
- \succ Incisal table orange.
- ➤ I class occlusion

Wax up





Operational template March 2012



Removing impressions for individual spoons



Individual Fradeani spoon



Individual spoons and blanks



Centric Relation



Impression caps in oral cavity



Fitting abutments





Impression for temporary crowns on implants and centric



Color detection 10/5/2012



Impression for the final restoration





Final restoration March 2013







Checkup 2015. August OPG





Clinical case №15

Patient (date of birth - 1984) Date of examination 15.04.2022 Midline shifted to the right. Skeletal class III wish tends to I.





Cephalometric analyses

Table 1

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	89.8	
Facial Depth	89°	95.0	2+**
Mandibular Plane	24.°	15.7	2B**
Facial Taper	68.0°	96.1	
Mandibular Arc	29°	39.5	2B**
Maxillary Position	65.0°	60.0	1-*
Convexity	00 mm	-0.6	
Lower Facial Height (by R. Slavicek)	44.2°	44.0	
Lower Facial Height to Point D	50.3°	48.0	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.7°	113,6	1-*
Upper Incisor Protrusion	3.7 mm	6.1	
Upper Incisor Inclination	24.0°	25	
Upper Incisor Vertical	mm	2.1	
Lower Incisor Protrusion	2,7 mm	2.6	
Lower Incisor Inclination	24.°	41.2	2+**
Upper Molar Position	18.0 mm	22	1+*
11			
Occlusal Plane	Norm	Value	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek)	Norm °	Value 7.9	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane	Norm ° °	Value 7.9 8.6	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO)	Norm ° ° 40.9 mm	Value 7.9 8.6 29.1	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee	Norm ° 40.9 mm mm	Value 7.9 8.6 29.1 82.3	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure	Norm ° 40.9 mm mm 0.0 mm	Value 7.9 8.6 29.1 82.3 0.0	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance	Norm ° 40.9 mm mm 0.0 mm -1.4 mm	Value 7.9 8.6 29.1 82.3 0.0 -0.8	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5 43.1	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5 43.1 42.1	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP)	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° ° ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1 48.7	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP) Relative Anterior Guidance	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° ° ° ° °	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1 48.7 40.7	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP) Relative Anterior Guidance Aesthetic Measurement (Lip Relation)	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° Norm	Value 7.9 8.6 29.1 82.3 0.0 -0.8 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1 48.7 40.7 Value	Trend Trend Trend



Important

OPI R = 2 degrees.

- OPI L = 6 degrees.
- SCI R = 52,4 degrees.
- SCI L = 56,6 degrees.
- Interincisal angle 113,6 degrees.

Anterior Guidance 48,7 degrees too low DOAR= 20de- grees,

DOAL= 20 degrees.

Low chewing efficacy. Maxilla position – neutral. Mandibule position – prognaic, wish tendency to neutral. Skeletal class is III wish tends to I.

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is brachiofacial

The skeletal trend of the mandible is strongly brachyfacial Skeletal class is III with tends to I.

The maxilla is positioned prognathic.

The mandible is positioned prognathic.

Lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is normal.

The inclination of the upper incisor is normal.

The protrusion of the lower incisor is normal

The inclination of the lower strongly increased.

The interincisal angle is diminished.

Occlusal concept: Group function.

Explanation

Table 2

Determinants	Norm	Value	Trend
Facial Axis	90.0°	89.8	
Facial Depth	89.0°	95.0	2+**
Facial Taper	68.0°	69.1	
Mandibular Plane	24.0°	15.7	2B**
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	389.0	2-**
Facial Lenghth Ratio	63.5%	69.0	2+**
Y Axis to S N	67.0°	74.4	
Y Axis (Downs)	61.2°	54.1	2-**
S N to Gonion Gnathion Angle	32.6°	29.0	-1*

Special Medical Analysis and dental analyses

Table 3

De	ntal History	Analys	is		Valuation	Yes	No		
1.	Do you have	ms when							
2.	Do you have	ms when	2	Х					
3.	Do you have property?	ms in clos	1	Х					
4.	Are any of y	our teet	h especial	lly sensitive?			Х		
5.	Do you have mouth very y	m when y			Х				
6.	Do your jaw what side?	joints r	nake nois	e and if so, on	3	Х			
7.	Do you have joints?	e pain in	the area of	of your jaw	2	Х			
8.	Do you suffe	er from	headaches	s?	2	Х			
9.	Do you suffe head, neck o	er from r throat	cramps or ?	spasm in your	1	Х			
10.	Do you have posture?	in gene	eral proble	ems with your	1	Х			
	Occlusal Ind	ex			1.71				
11.	Have you ev	serious aco			Х				
12.	Did you hav	e one or	more ora			Х			
13.	3. Have you ever had orthodontic treatment or .				•	Х			
14.	4. Have you had a treatment with splint?						Х		
15.	5. Are you grinding or pressing with your teeth?					Х			
16.	5. Do you think that treatment is necessary?					Х			
17.	7. Do you think that there is a serious disorder or illness? X						Х		
18.	8. When the last time you had dental treatment and what was done?								
19.	How would	you des	cribe you	r psychic behavi	or?				
	happy	sad	calm	excited	self- lack of self- controlled control				
					Х				
<u> </u>									

Table 4

Spec	ial Medical Analysis			
Do y	ou have or did ever have an illness with regard to point	t 1-12?		
		Yes	No	
1.	Infections		X	
2.	Cardo-vascular systems		X	
3.	Respiratory system		X	
4.	Digestive system		X	
5.	Metabolic system		X	
6.	Allergies		X	
7.	Urogenital problems		X	
8.	Central nervous system		X	
9.	Psychological problems (therapy)		Χ	
10.	Rheumatic disease		X	
11.	Hormonal disease		X	
12.	Special problems		X	
Main concern: aesthetic, low chewing efficacy				

Muscle palpation

Table 5

Muscle Diagnosis		Right		Left	
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.			Х	
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae			Х	
6.	M.pterygoideus medialis				
7.	M.mylohyideus	X		(avoidance pattern)	X
8.	M.digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus	X			X
13.	M.omohyoideus	X			X
14.	Tongue				
15.	Comparative palpation of jaw joints				
	a) Lateral poles, statically				
	b) Lateral poles, in rotation				
	c) Retral joint space				
	d) Lig.temporo-mandibulare		X		

Movement Muscles:

- ➢ Posture 1,2, 7, 12, 13, 14.
- ➤ Closing 3a, 3b, 4a, 4b, 5.
- Opening / Protraction 8, 9, 10.
- Retraction 3c, 8 Medio-/Laterotraction 6, 3a, 4a Hyoid-Position 8, 9,10, 11, 13.
- ➤ Functions 7, 8, 9,10, 11, 14 TMJ 15a, 15b, 15c, 15d.
- ≻ Closing, TMJ.

List of problem:

- 1. No anterior control.
- 2. No canine control.
- 3. Lower incisal are crowding.
- 4. Elongation 11, 21.
- 5. Muscle problems.
- 6. Posture.

Treatment objectives:

- Centric relation and casts remounting.
- ➢ Myopatic splint therapy.
- ➢ Full mouth rehabilitation.

Condylography

Protrusion/retrusion (left). Time curve. Muscle tension. Gamma rotation – no rotation, translational component. Deviation to the left.







Mediotrusion left






Overlap open-close and Protrusion/retrusion



Speech 50-60 - Detrusion



Speech 60-70



Mastication



Free movement



Treatment plan:

- 1. CR determination.
- 2. Wax-up.
- 3. Long time temporaries.
- 4. Final restorations.

Muscle Palpation after treatment

Table 6

Mu	iscle Diagnosis	R	ight	Left	
		+	++	+	++
1.	Shoulders and neck	Γ			
2.	Atlanto-occipital region				
3.a	M.temporalis ant.	Γ			
3.b	M.temporalis med.			X	
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae				
6.	M.pterygoideus medialis				
7.	M.mylohyideus			X	
8.	M.digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw				
	b) Lateral poles, in rotation				
	c) Retral joint space				
	d) Lig.temporo-mandibulare				

Casts mounted in articulator.







OPI R = 2, OPI L = 6.

Casts mounted in reference position.



Treatment plan correction:

- ➤ Gingiva correction 11, 21.
- ➤ Muscle relaxation.
- \blacktriangleright AG +10 degrees, = 58 degrees.
- ➤ Canine control.
- \triangleright OPI R = 12 degrees.
- \succ OPI L total = 16 degrees.
- > SCI R = 52 degrees, yellow insert.
- > SCI L = 56 degrees, black insert.
- > Bennett movement R = 17 degrees, yellow insert.
- > Bennett movement L = 0 degrees, white degrees.
- Decrease lower incisors -1,5 mm increase hight of lower molars. Create posterior support.

Articulator settings



Determination of Therapeutic position after osteopathic treatment Casts in PR.



Determination of Therapeutic position after osteopathic treatment Casts in PR with centric relation.



- Casts were remounted into articulator after centric relation determination.
- \blacktriangleright Verticalisation +2 mm was done.
- In dental laboratory was done elongation of the length of upper incisors and canines.
- The gap between incisors in the frontal area we close symmetrically with upper and lower incisors.
- ➢ AG change to 60 degrees.
- ➤ Asymmetrical case.

VTO +2 mm incisal pin





SCI R. 52 18	OPI=4	DAO
SCI L. 56 16	OPI=10	DAO

Cephalometric analyses VTO

Table 7

Slavicek Analysis			
Skeletal Measurement	Norm	Value	Trend
Facial Axis	90.0°	88.9	
Facial Depth	89°	94.4	1+**
Mandibular Plane	24.°	16.7	1B*
Facial Taper	68.0°	68.8	
Mandibular Arc	29°	39.6	2B**
Maxillary Position	65.0°	60.0	1-*
Convexity	00 mm	0.00	
Lower Facial Height (by R. Slavicek)	44.2°	45.0	
Lower Facial Height to Point D	50.3°	49.3	
Dental Measurement	Norm	Value	Trend
Interincisal Angle	131.7°	112,7	1-*
Upper Incisor Protrusion	3.7 mm	6.5	1+*
Upper Incisor Inclination	24.0°	26.2	
Upper Incisor Vertical	mm	-0.4	
Lower Incisor Protrusion	2,7 mm	2.5	
Lower Incisor Inclination	24.°	41.0	2+**
Upper Molar Position	18.0 mm	21.2	1+*
Occlusal Plane	Norm	Value	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek)	Norm °	<mark>Value</mark> 11.2	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane	Norm °	Value 11.2 8.2	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO)	Norm ° 40.9 mm	Value 11.2 8.2 27	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee	Norm ° 40.9 mm mm	Value 11.2 8.2 27 82.	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure	Norm ° 40.9 mm mm 0.0 mm	Value 11.2 8.2 27 82. -2.8	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance	Norm ° 40.9 mm mm 0.0 mm -1.4 mm	Value 11.2 8.2 27 82. -2.8 0.7	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm	Value 11.2 8.2 27 82. -2.8 0.7 Value	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6	Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5 43.1	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5 43.1 42.1	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP)	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° ° ° ° ° ° ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5 43.1 42.1 48.7	Trend 1-* Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP) Relative Anterior Guidance	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm -1.4 mm ° ° ° ° ° ° ° ° ° ° ° ° ° ° °	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1 48.7 40.7	Trend Trend
Occlusal Plane Occlusal Plane – Axis Orbital Plane (Slavicek) Idealized Occlusal Plane – Axis Orbital Plane Distance Occlusal Plane – Axis (DPO) Radius of Curve of Spee Lip Embrasure Occlusal Plane Xi Distance Functional Measurement Horizontal Condylar Inclination right Horizontal Condylar Inclination left Horizontal Condylar Inclination Relative Condylar Inclination Relative Condylar Inclination 6 Relative Condylar Inclination 7 Relative Condylar Inclination 8 Anterior Guidance (S-AOP) Relative Anterior Guidance Aesthetic Measurement (Lip Relation)	Norm ° 40.9 mm mm 0.0 mm -1.4 mm Norm ° ° ° ° ° ° ° ° ° Norm Norm	Value 11.2 8.2 27 82. -2.8 0.7 Value 50.4 58.6 54.5 46.5 46.5 43.1 42.1 48.7 40.7 Value	Trend Trend

Slavicek Interactive Verbal Analysis

The skeletal trend of the skull is mesiofacial.

The skeletal trend of the mandible is strongly brachyfacial Skeletal class is III with tends to I.

The maxilla is positioned neutral

The mandible is positioned neutral with tendency to prognathic.

Lower facial height is normal.

Dental class unknown.

The protrusion of the upper incisor is increased.

The inclination of the upper incisor is normal.

The protrusion of the lower incisor is normal.

The inclination of the lower strongly increased.

The interincisal angle is diminished.

Occlusal concept: Group function.

Explanation

Determinants	Norm	Value	Trend
Facial Axis	90.0°	88.8	
Facial Depth	89.0°	94.0	1+*
Facial Taper	68.0°	68.8	
Mandibular Plane	24.0°	15.7	1B*
Related Values	Norm	Value	Trend
Bjoerk Sum	396.0°	389.9	2-**
Facial Lenghth Ratio	63.5%	68.4	2+**
Y Axis to S N	67.0°	68.2	
Y Axis (Downs)	61.2°	54.9	2-**
S N to Gonion Gnathion Angle	32.6°	29.9	



Muscle Palpation was done after osteo- pathic treatment. CR determination +2 mm incisal pin.

Table 9

Mu	iscle Diagnosis	Right		Left	
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.			x	
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae				
6.	M.pterygoideus medialis				
7.	M.mylohyideus			X	
8.	M.digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw joints				
	a) Lateral poles, statically				
	b) Lateral poles, in rotation				
	c) Retral joint space				
	d) Lig.temporo-mandibulare				

Table 10

Mu	Muscle Diagnosis			Left	
		+	++	+	++
1.	Shoulders and neck				
2.	Atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae				
6.	M.pterygoideus medialis				
7.	M.mylohyideus	X			
8.	M.digastricus				
9.	Suprahyoidale M.				
10.	Infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
15.	Comparative palpation of jaw joints				
	a) Lateral poles, statically				
	b) Lateral poles, in rotation				
	c) Retral joint space				
	d) Lig.temporo-mandibulare				

Basic and relative criteria for teeth evaluation.

- ➢ Occlusion.
- \succ Tooth axis.
- ➢ Gingival level.
- Interproximal contact level.
- ➤ Tooth relative size.
- Tooth shape basic characteristics (basic characteristics, surface texture, color).
- Incisal edge configuration.
- ➤ Lower lip line.
- ➤ Smile symmetry.



Table 11

Tooth relative size

Tooth	13	12	11	21	22	23
Height	11,12	8,4	10,2	10,51	8,67	9,94
Width	7,8	6,3	7,8	8,70	6,01	6,69

Functional evaluation

- \succ Central incisor depth overbite= 1mm.
- \blacktriangleright Central incisor width overbite = 1 mm.
- > Anterior guidance = 0 mm.

- \succ Vertical dimension = 19.32.
- \succ Centric relation.

Aesthetic evaluation

- \blacktriangleright Tooth 21-11 is visible at 1 mm in a relaxed state.
- \succ The lower inc.
- \succ Aesthetic and functions.
- ➢ Incisor is visible in a relaxed state.

Morpho psychology - Visagism









Oval

Triangular

Organized Perfectionist Artistic Abstractive Timid Reserved Copyright Dr Christian Coscheman & Dr David Dunn

Extroverted Communicative enthusiastic Dynamic Impulsive Rectangular determined Objective Explosive

Intense

entrepreneur

Passionate

Diplomatic Pacific Mystic spiritualized Conformist Discreet

Square

Oval	Triangular	Square cut	Square
Central incisors are dominated	Smile upline	Central incisors are dominated	Absence of domination
Round cusps	Divergent tooth axis	Flat incisal edge	Axis divergence
Lateral mandibular incisors are poorly pronounced	Cusps inclination	Aggressive cusps	Horizontal line of cutting edge and canines
Round dental arch		Vertical axis	
Melancholic	Sanguine	Choleric	Phlegmatic
Organized Perfectionist Artistic Abstractive Timid Reserved	Extroverted Communicative Enthusiastic Dynamic Impulsive	Determined Objective Explosive Intense Entrepreneurs passionate	Diplomatic Pacific Mystic Spiritualized Conformist Discreet

Final restoration June 2022.





Supplement





2/4





Findings Initial-Diagnostics

Name _____ Date _____

Main concern

Special Medical Analysis

Do you have or did you ever have an illness with regard to points 1-12?

1.	Infections	yes	no	7.	Urogenital problems	yes	no
2.	Cardio-vascular systems			8.	Central nervous systems		
3.	Respiratory systems			9.	Psychological problems (theraphy)	- <u>1</u>	
4.	Digestive systems			10.	Rheumatic disease		
5.	Metabolic systems			11.	Hormonal disease		
6.	Allergies			12.	Special problems		

Dental History Analysis – Occlusal Index

		valuation	yes	no
1.	Do you have problems when you chew?	_		
2.	Do you have problems when you are talking?			
3.	Do you have problems in closing your teeth properly?	1		
4.	Are any of your teeth especially sensitive?			
5.	Do you have a problem when you open your mouth very wide?			
6.	Do your jaw joints make noise and if so, on what side?			
7.	Do you have pain in the area of your jaw joints?			
8.	Do you suffer from headaches?			
9.	Do you suffer from cramps or spasm in your head, neck or throat?			
10.	Do you have in general problems with your posture?			
	Occlusal Index	0.00		

11.	Have you ever bad a serious accident?	yes	no
12.	Did you have one or more oral intubations?		
13.	Have you ever had orthodontic treatment or		
14.	Have you had a treatment with a splint?		
15.	Are you grinding or pressing with your teeth?		
16.	Do you think that treatment is necessary?		
17.	Do you think that there is a serious disorder or illness?		
18.	When was the last time you had dental treatment and what was done?		
19.	How would you describe your psychic behaviour? happy sad calm excited self-controlled lack of se	elf contr	ol

Muscle Diagnosis

		ri	ght	k	eft
1	shoulders and neck	+	++	+	++
2	atlanto-occipital region				
3.a	M.temporalis ant.				
3.b	M.temporalis med.				
3.c	M.temporalis post.				
4.a	M.masseter (superficial)				
4.b	M.masseter (deep)				
5.	Tuber maxillae				
6.	M.pterygoideus medialis				
7.	M.mylohyoideus				
8.	M.digastricus				
9.	suprahyoidale M.				
10.	infrahyoidale M.				
11.	Larynx				
12.	M.sterno-cleido-mastoideus				
13.	M.omohyoideus				
14.	Tongue				
		ri	aht	1	eft
		+	++	+	++
15.	comparative palpation of jaw joints				
	a) lateral poles, statically				
	b) lateral poles, in rotation				
-	c) retral joint space				
	d) Lig.temporo-mandibulare				

Preliminary Brainstem Nerve Analysis

1.	N.olfactorius (analysis)	
2.	N.opticus (analysis)	
З.	N.oculo-motorius (clinical mobility)	
4.	N.trochlearis (clinical mobility)	
5.	N.trigeminus (clinical palpation and sensitiveness)	
6.	N.abducens (clinical mobility)	
7.	N.facialis (clinical mobility)	
8.	N.stato-acusticus (clinical check of equilibrium and hearing)	
9.	N.glosso-pharyngeus (clinical and analysis)	
10.	N.vagus (analysis)	
11.	N.accessorius (clinical and analysis)	
12.	N.hypoglossus (clinical and analysis)	

Chronic pain





Myofunctional Disturbances



Tooth Status – Periodontal Status - Occlusogram

Check list practical work / VC – Module A (check off each finished item)

Name:

Photo documentation

	Extra oral	0
	Intra oral	0
	Models	0
Casts /	models	
	Impression taking	0

Model fabricationO

Initial diagnostics

Medical analysis	0
Dental history analyis	0
Occlusal index	0
Muscle diagnosis / Palpation	0
Preliminary Brainstem nerve analysis	0
Chronic pain	0
Myofunctional disturbances	0

Reference position

Reference Position	(procedure)	0
reference i obidon	(procedure)	

Face bow / Articulator

Face bow anatomic	0
Maxillary cast mounting in articulator	0
Mandibular mounting in articulator	0

Training Checklist / VC – Module B

Name: _____

Condylography

Individual Para-Occluksal Clutch	0
Mount Upper-Lower Condylograph	0
Hinge-Axis Location (manually!!)	0
Set-Up Electronic System and Computer Software	0
Perform Standard Excursive Tracings	0
E-CPM – Records	0
Perform functional Tracings (Speech, Brux, Chewing)	0
Remove Electronics, store recorded data on the computer	0
Mark Reference points on the skin (pen)	0
Remove lower face-bow	0
Mount bite-fork to upper condylograph and remove face-bow	0

Exact Mounting (after condylography!!)

Mount upper model according to exact hinge-axis	0
Mount lower with centric bite record	0

Ceph (after condylography!!)

Stick metal grain onto the Reference marks on the skin	0
Ceph picture	0
Do Ceph Tracing analysed (computerized - CADIAS)	0

Brux-Checker (before mounting!!)

Make upper and lower Brux-Checker. Wear 2 nights (Sat-Sun, Sun-Mon) alternating upper and lower

0

Full name of the technician Full name of the Doctor Patient's full name Date of sending Date of completion of the work They were transferred to the laboratory SCI degree R L color R L Bennett degree R L color R L Anterior guidance Lower Facial height initial theraputic VD(veri dimertia) degree Change(+/-) incisal pin Close the gap lower upper MPY X= X1= Y= Y1= Z= Ζ1 Splint therapy settings

Туре	релаксационный	декомпрессионный	стабилизирующий;	позиционирующий	репонирующий
of					
splint					
Guidan	ice type				
Diagno	ostic casts				
Hard co	entric				
Pin-stu	mp tab				
Type o	f metal				
Wax m	odeling by Slavi	chek			
Cerami	c restoration				
Color o	of structures				
Individ	ual spoon				
Setting	8				

Upper jaw:

Split-caste models	
Double Pin	

1.	
2.	
3.	

4.

Lower jaw:

Split-caste models	
Double Pin	

1.	
2.	
3.	
4.	

Sent to the courier:

Doctor's signature:

Date:

Main causes for post- orthodontic malocclusion.

- 1. Lack of understanding of how malocclusion developed.
- 2. Underlying factors are not corrected.
- 3. Original malocclusion may return.
- 4. This may be more of a problem in certain types of malocclusion.
- 5. Lack of understanding of how malocclusion developed.
- 6. Incorrect diagnoses/ treatment planning and incomplete understanding of CMS function.
- 7. Extraction treatment.
- 8. Lack of occlusal support and guidance.
- Incorrect Diagnoses and treatment planning and incomplete understanding CMS function: Occlusal plane inclination, vertical dimension, posterior discrepancy is not into account and are often the cause of malocclusion.
- 10. If the root cause is not identified and corrected will lead to functional problems and relapse post treatment.



Clear aligner therapy:

- 1. Poor tool to tork teeth and often cases finish with anterior guidance too steep.
- 2. Almost impossible to establish good posterior support.
- 3. No control over the occlusal plane.
- 4. Often see overloaded anterior teeth and overloaded joints due to the above factors.



Proposal to prevent posterior malocclusion.

- 1. Proper exam and diagnostic of root cause of the malocclusion.
- 2. Remove 8s to resolve posterior discrepancy.
- 3. Establish proper vertical dimension.
- 4. Reconstruct the occlusal plane.
- 5. Create canine dominated sequential guidance.
- 6. Avoid premolar extraction.
- 7. Pay special attention to the tork of all upper anterior teeth.

- 8. Treat to a broad arch form.
- 9. Create strong posterior support to maintain mandibular position and protect the anterior teeth/joints.
- 1. Mandibular position.
- 2. Vertical dimension.
- 3. Occlusal plane.
- 4. Sceletal classification.
- 5. Mandibular incisors.
- 6. Maxillary incisors.



Extraction of premolars.

- 1. Incisors guidance too steep.
- 2. Narrow arch form.
- 3. Molars and premolars with poor inclination.
- 4. Loss of posterior support and retrusive guidance.

Main causes for orthodontic malocclusion.

- 1. Lack of occlusal support and guidance: many times, after treatment the buccal segments. Have been up righted mesio-distally and labiolingually.
- 2. Often the incisor and cuspid guidance is steep



Restore small laterals instead of closing space and lower IPR. To achieve these goals: MEAW as working wire.

- 1. Establish vertical dimension and correct occlusal plane.
- 2. Sure smile as a finishing tool to achieve final detailing.
- 3. High torque brackets.
- 4. Use of intraoral scanner/ occlusograms to check occlusion from the lingual.
- 5. Finish with minimal OJ/OB in patients where the upper incisors have a strong tendency to make the mandible pull back.



Traditional vs new orthodontics.

Traditional New	Orthodontic
Genetic	Mostly epigenetic and environmental
Symptomatic treatment	Root cause treatment
Mechanical	Biologic
Tooth centered treatment	Joint centered treatment
Static	Dynamic
Esthetic	Functional and esthetic
8s are a local problem	8s have far reaching effects
Traditional treatment approach	New treatment approach
Headgear	OP/VD and PD control
Premolar extraction	Extraction of 8s
Orthognatic surgery	Very little orthognathic surgery
Longer treatment plan	Shorter treatment times
Often has built in instability	Very stable
No reconstruction of occlusal plane	Functional and esthetic
8s are a local problem	Reconstruction of occlusal plane
Focused on sagittal	Focused on vertical dimension
Maxilla centered mechanical tx	Mandibular position centered tx
Conclusion

The main reason for post orthodontic malocclusion is:

- 1. How malocclusions develop in the first place. Because the underlying factors are not corrected, it is no surprise that the original malocclusion may return. This is true more so for some than other forms of malocclusion.
- 2. Based on the principle that the cranio-facial complex is highly adaptable, we use biolog- ical principles within the masticatory system to encourage the adaptation we want to take place.
- 3. Several important factors that occur during facial development and are often the cause of malocclusions are: the steepness of the OP, the VD and posterior discrepancy. When these factors are not taken into account the root cause of the problem will not be correct- ed, which may lead to functional problems and relapse after treatment is completed.
- 4. One of the biggest things to avoid is the removal of any teeth, e.g. any number of bicus- pids or the closing of spaces of any congenitally missing teeth. This often leads to upper incisors that have too steep a guidance, an arch form that is too narrow, and molars that have a poor mesio-distal and labio-lingual inclination, which leads to loss of posterior sup- port. Furthermore, when 4's are removed, the retrusive guidance tool is removed

Also, we prefer to use restorative solutions rather than IPR if needed.

What should profession do better?

- 1. Diagnose better and resolve the root cause of the problem: Extract 8's to relieve poste- rior discrepancy, establish the proper VD, reconstruct the OP and create cuspid dominated sequential guidance, we should treat to a joint determined position not a not a tooth deter- mined position.
- 2. Whenever possible treat to an occlusion with 28 teeth.
- 3. Pay special attention to the inclination (torque) of all upper anterior teeth (cuspid to cus- pid), and have a broad archform.
- 4. Create strong posterior support to maintain mandibular position and protect the anterior teeth and joints.

Means of achieving this

- 1. MEAW as a working wire to establish VD and correct the OP.
- 2. Suresmile as a finishing tool to achieve the final detailing.
- 3. Use of high torque brackets on the upper anterior teeth.
- 4. Use of an intraoral scanner to observe the occlusion from the lingual before debanding.
- 5. Some patients have a very strong reaction to retracted/steep upper incisors. In these patients the proper torque is very important and we are now trying to finish them like Class III patients with minimal OJ/OB.

Invisalign has several significant drawbacks.

- 1. It is a very poor tool to torque teeth and very often cases are finished with too steep of a guidance.
- 2. It is almost impossible to establish good posterior support.
- 3. No control over the OP.
- What we often see in finished Invisalign cases is overloading of the anterior teeth and the joints because of the above-mentioned factors. This holds true for all aligner therapy systems, not just Invisalign.

References

1. Bulycheva E.A. Differentiated approach to the development of pathogenetic therapy of patients with dysfunction of the temporomandibular joint, with masticatory muscles hypertension complications. Author's abstract of a doctoral thesis (Medical Sciences, 14.01.14) Saint-Petersburg, 2010; 28 (In Russ.)

2. Dawson P. Functional Occlusion: From TMJ to Smile Design (translated) Edited by Koneva, D. B. Moscow, 2016: 529 (In Russ.)

3. Ryakhovsky A., Degtyarev V., Yumashev A., Ahlering A. Automated system of dental prosthetics "DENTAL" // "Informatization of Russian regions": Abstract. doc. - Saint-Petersburg., - 1995; 133-137 (In Russ.)

4. Sevbitov A., Borisov V., Kanukoeva E. et al. Study of the retention ability of individual protective dental splinting relative to the boundaries of their base. Proceedings of the international symposium "Reliability and quality". Penza State University, 2015; 2: 363—4 (In Russ.)

5. Trezubov V.N., Fadeev R.A. Planning and prediction of treatment of patients with dentoalveolar anomalies: a manual for postgraduates. Medpress-Inform. Moscow, 2005; 224 (In Russ.)

6. Utyuzh A.S., Yumashev A.V., Zagorskij V.V., etc. Clinical aspects of biomechanics of implants included in the block. — Modern science: actual problems of theory and practice. Series: Natural and Technical Sciences. — 2016; № 7: 92—97 (In Russ.)

7. Utyuzh A., Yumashev A., Mikhailova M. Titanium alloys prosthodontic devices in patients with intolerance to traditional dentures // Vrach. 2016; N_{2} 7: 62—64 (In Russ.)

8. Chikunov, S.O. Prosthetics using zirconium dioxide. - Institute of Dentistry. - 2012. - № 3.: 60-61 (In Russ.)

9. Chikunov, S.O. A gentle method of prosthetics without preliminary preparation of supporting teeth. Institute of Dentistry. 2012. № 2: 52-53 (In Russ.)

10. Chikunov, S.O. Axioquick Recorder: a new quality standard in dentistry. LAB. 2005. № 3: 3-6 (In Russ.)

11. Yumashev, A. V. Intolerance to prosthodontic structures, galvanism manifestations (In Russ.) V. Yumashev, E. A. Kristal, Mikhailova M.V., I.G. Kuderova. Health and education in the XXI century. - 2012. - T. 14,

№2: 26 (In Russ.)

12.Sato S, Takamoto K, Fushima K, et al. A new orthodontic approach to mandibular lateral displacement malocclusion. Importance of occlusal plane reconstruction. Dent Jpn. 1989;26:81-85.

13.Sato S, Yuyama N, Tamaki K, et al (2002) The masticatory organ, brain function, stress- release, and a proposal to add a new category to the taxonomy of the healing arts: occlusion medicine. Bull Kanagawa Dent Coll 30: 117-126.

14.Sato S, Slavicek R (2001) Bruxism as a stress management function of the masticatory organ. Bull Kanagawa Dent Coll 29: 101-110.

364

15. Slavicek R.: Das Kauorgan, Klosterneuburg: Gamma, Med.-wiss. Fortbildunggesellschaft 2000.

16. Slavicek R.: The Masticatory organ: Functions and dysfunctions / Rudolf Slavicek. - Klosterneuburg: Gamma Med. -wiss. Fortbildung - AG, 2002

17. Slavicek R.: Occlusal concepts in complete dentures-new functionrelated appliance 1-2-3-Quintessenz Zahntech. Jul.; 15 (7): 743-53 - Aug. 15 (8):847-56 Sept. 15 (9): 1009-16 German

18.Slavicek R.: Morphology of the incisor-canine group Inf.Orthod.Kieferorthop. (1982) 14 (1) 73-75 German

Sato S, Kim JI, Kim KM, et al. Significance of early orthodontic treatment of malocclusion with dysfunction in the craniomandibular system. Bull Kanagawa Dent Coll. 2004; 32:37-48.

19. Yumashev A.V., Utyuzh A.S., Mikhailova M.V., Samusenkov V.O., Volchkova I.R. Selecting clinical and laboratory methods of manufacture of orthopaedic titanium alloy structures using a biopotentiometer. Current Science (India). 2018. V. 114. № 4, 891-896.

20. Yumashev A.V., Mikhailova M.V., Fomin I.V., Li J., Yang B. A new concept for the treatment and rehabilitation of patients with pathologic comorbidities using cutting-edge digital technologies in dental orthopaedics. European Journal of Dentistry. 2020. T. 14. № 4. C. 533-538.

21. Volchkova I.R., Yumashev A.V., Utiuzh A.S., Doroshina V.I., Mikhailova M.V. Use of polyether ether ketone in removable dentures: Analysis and comparison with other thermoplastic materials (literature survey). Clinical dentistry 2018; 1(85): 68-71.

365

22 Mikhailova Maria, Chikunov Sergey, Dzalaeva Fatima, Utyuzh Anatoliy, Yumashev Aleksey. The influence of dental orthopedic rehabilitation procedures on manifestations of obstructive sleep apnea in patients with temporomandibular disorder/ Problems of Dentistry, 2020, V. 16, N_{2} 2, pp. 114-120.

23. Mikhailova M.V., et al. Modern manufacture of complete dentures by CAD/CAM-technologies in the treatment and rehabilitation of patients with a burdened allergic history (clin).