Case Report

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The Restoration of Chewing Function and Facial Ethics in Condition of Extensive Atrophy Bone and Persistent Ischemic Hypoxia Maxillofacial Zone with Usage of Dental Implants

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Background

Patient, female, 59 years old consulted Innovative Dental Center "Aist", regarding her complaints of disturbance of chewing and face aesthetics due to absence of teeth in the upper and lower jaws.

Anamnesis: In order to find a solution for the patient's issues they conducted detailed anamnesis of her condition. Fifteen years ago after moving to Vladivostok city (she moved to a new region) she noticed significant changes in her dentofacial system: hyperemia and bleeding in gums, tooth loosening and loss. When she consulted dentists (as the patient explained) she was diagnosed with chronic periodontitis. Rational prosthetic care did not help preserve the teeth. Five years ago the patient lost her last teeth. She tried using removable dentures several times, but they would not stay fixed due to significant atrophy of alveolar ridge. The dentures would fall our when she talked and ate.

Physical Examination Revealed the Following:

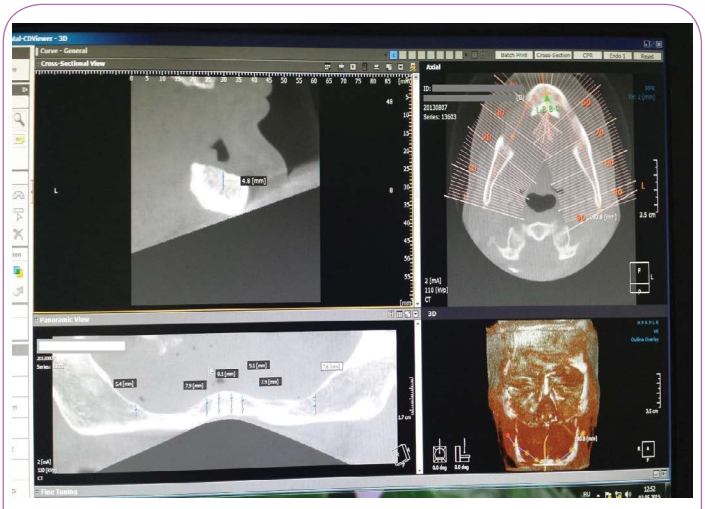
- Facial asymmetry;
- Height of the lower third of the face is reduced;
-Nasal labial folds and submental creasers are significant;
-Sunken cheeks and lips;
-Unfixed occlusion;
-Gum mucosa is pale pink and thinned;
-Moderate atrophy of alveolar bone on the upper jaw, palate is of average depth. Mucobuccal folds are subtle;
-Breadth in the area of upper jaw is from 4 to 5 mm;
-Height in the area of 1.3-2.3 to the bottom of nasal cavity is greater than 10 mm, in the area of 1.4-1.7, 2.4-2.7 to the bottom of the upper maxillary cavity is 4-5 mm;
-In the area of the lower jaw-level significant atrophy of alveolar ridge, labile mucosa is attached almost on the level of alveolar ridge;
-Breadth of alveolar ridge in the area of 4.2-3.2 is up to 5 mm, height is 12 mm;
-Breadth of alveolar ridge in the area of 3.6-3.7 and 4.6-4.7 is up to 12 mm, height of inferior dental canal is 2-5 mm **(Table 1)**.

Based on results of computed tomography they considered interrelations of posterior mandible to inferior dental canal on the right and on the left. In order to rule out injuries, they made a decision to install implants in the area of 3.6, 3.7, 4.6 and 4.7, 3.5 mm in diameter and 8 mm in length on the vestibular side in respect of the mandibular nerve. Photo of the computed tomography **(Pictures 1-2.3)** shows points where implants were installed.

Table 1 Height and breadth of alveolar ridge in the area of implants installation based on data of computed tomography.

Tooth No.	Height of alveolar ridge, mm	Breadth of alveolar ridge, mm
1.1	11.0	4.2
1.3	11.2	4.4
1.4	6.0	4.5
1.5	6.0	4.2
1.6	5.0	4.8
2.1	11.0	4.0
2.3	11.0	4.2
2.4	8.0	5.4
2.6	6.0	4.8
4.1	12.0	4.5
4.6	3.0	12.0
4.7	3.0	12.0
3.1	12.0	5.0
3.6	2.0	11.0
3.7	2.0	12.0

Picture 1 Computed tomography.



Picture 2.1 Computed tomography.

Methods of Examination

- Analysis of computed tomography **(Pictures 1 and 2)**
- Analysis of diagnostic models **(Pictures 3 and 4)**
- Analysis of photographs **(Pictures 6-9)**
- Diagnosis of blood circulation in upper and lower jaws

Based on complaints, answers in the patient's personal file, anamnesis and objective examination, nature of the described symptoms, examination of the oral cavity, state of TMJD they found the following:

Complete edentia of the upper and lower jaw;

Atrophy of alveolar ridge of the toothless lower jaw, Keller's 2 stage;

Atrophy of alveolar ridge of the toothless upper jaw, Schredder's 3 stage.

The patient M. was offered detailed explanation of the causes of

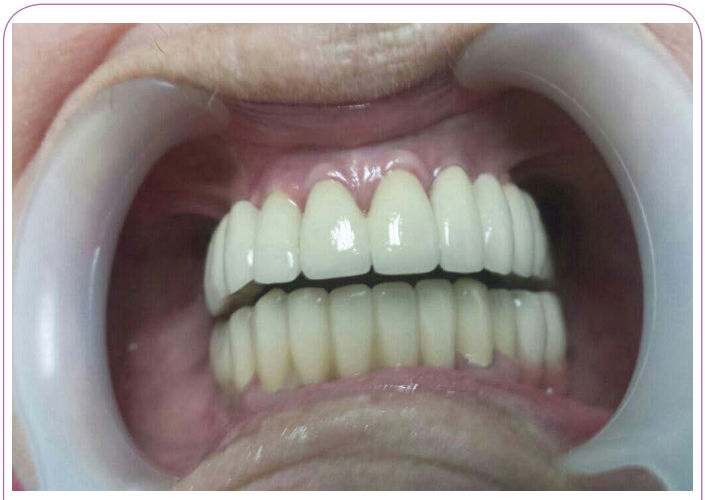
Picture 2.2 Computed tomography.

Picture 2.3 Computed tomography.

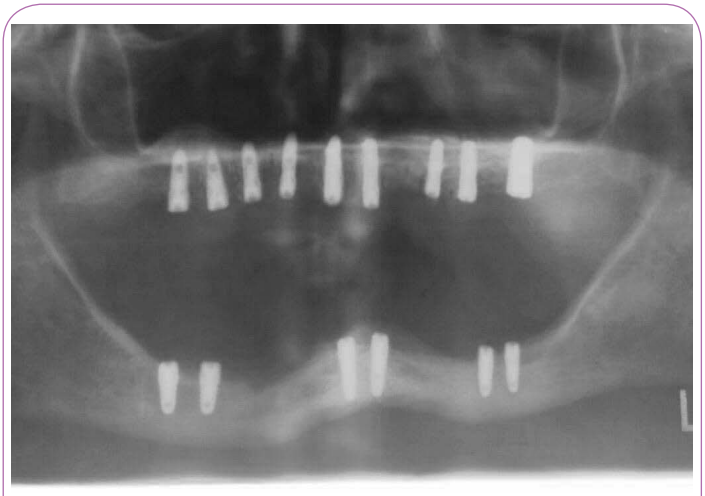
Picture 3 Diagnostic models.

Picture 6 Photograph before treatment.

Picture 4 Diagnostic models.



Picture 7 Photograph of teeth after treatment.



Picture 5 Orthopantomogram after installing implants.

Picture 8 Photograph of the patient's face before treatment (significant nasal labial folds, sunken lips).

Picture 9 Photograph of the patient's face after the treatment.

her dental problems. She was proposed dental implantation on the upper and lower jaw to ensure prosthetic teeth.

The Plan for Dental Implantation was Coordinated in Writing

- Installing implants in the following areas of the upper jaw: 2.1, 2.3, 2.4, 2.6, 1.1, 1.3, 1.4, 1.5, 1.6 and simultaneous build up of the height of posterior areas around 1.4-1.6, 2.4-2.6-sinus augmentation;
- Installing implants in the following areas of the lower jaw: 4.6, 4.7, 4.1, 3.1, 3.6, 3.7 and simultaneous osteoplasty of posterior areas.

Preparatory Stage

- Complete blood count;
- Coagulation time;
- Duration of bleeding;
- Blood sugar;
- Test for Syphilis
- Test of Hepatitis B and C, AIDS
- Computer-aided examination of overall health condition using the apparatus "DgKtd-01".

Computer-aided diagnostics helped reveal stabile ischemic hypoxia in the area of the missing teeth. Results of the laboratory tests are within the normal range. Blood pressure is 120/75 mm Hg **(Figure 1)**.

Surgical Treatment

Infiltration anesthesia Sol. Articaini 4% 1:100 000 5 carpules 1.7 ml. Cut along the peak of alveolar ridge in the area of 1.6-2.6. Alveolar bone is skeletonized, sinus is opened in the area of 1.4-1.6 2.4-2.6, sinus is filled with BIO-OSS doses 0.5 g+auto bone (is obtained with bone collector while preparing implant bed).

Implants made in Korea SCM were inserted in the area 1.1, 1.3, 1.4, 1.5, 1.6, 2.1, 2.3, 2.4, 2.6., Vycril sutures.

2 months later surgery was made on the lower jaw. In accordance with the diagnostics implants were inserted into the following areas: 4.1, 4.6, 4.7, 3.1, 3.6, 3.7. In the points 3.6, 3.7, 4.6, 4.7 implants were inserted distally in respect of nervus mandibularis. BIO-OSS was added+auto bone (obtained with bone collector while preparing implant bed)+DIO-GIDE.

The Following Recommendations were Given after the Surgery

Antibiotic therapy Flemoclav Solutab 875 1 tablet 2 times a day for 5 days, antihistamine medication Cetrine 10 ml 1 tablet before sleep for 3 days, treating oral cavity with Chlorhexidini bigluconas 0.05% until the suture is removed.

Physiotherapy Aid

The patient was administered irradiation of oral cavity before surgery on the side of the buccal wall of the alveolar bone and over lymph nodes that drain oral cavity. They used infrared laser "TweenFlex", standard tip (780 nm), 70 mW for 10 seconds in each point.

After the surgery the patient was administered a course of dynamic electrical nerve stimulation using apparatus "Denas RMB" to help alleviate edema and pain in the area of implantation quicker. Skin projection of the area of surgery was treated at the frequency of 77 Hz, power scope-2; frequency 10 Hz-symmetrical zones, jugular zone, zones of needle therapy concordance (5 sessions).

At the same time the patient underwent 2 sessions of micro kinesitherapy which helped reveal and eliminate muscle gripes (blocks) in the body caused by implantation and effect of anesthesia. It has been proven that this method can be successfully implemented to facilitate healing of injuries and after surgeries.

A month after implantation the patient underwent a course of physiotherapy using Corrector apparatus "ANKF-01" to normalize blood circulation in the maxilla-facial area and facilitate integration of implants (5 sessions).

The following scheme was used to normalize blood circulation in the maxilla-facial area:

Session 04_10_88-DT-01 (right)

05_04_113-02 (right)

05_19_143-02 (right)

When the patient underwent computer-aided dermography again (15 months after the surgery), all indicators on the part of general health were within the normal range: blood circulation in the maxilla-facial area was normalized **(Figure 2)**.

Mobility of implants was tested before proceeding to prosthetics using PERIOTEST S 3218 apparatus that complies with requirements EN60601-1 and EN 60601-1-2 **(Table 2)**.

The obtained result proved that the lability of implants varies from -6 to -2 relative units (-0.0750 mm-0.0250 mm).

Thus they can declare that osteointegration of implants is complete on both jaws of the patient M.

8 months after the first surgery the patient was given healing abutment. Then rational prosthetic teeth were manufactured.

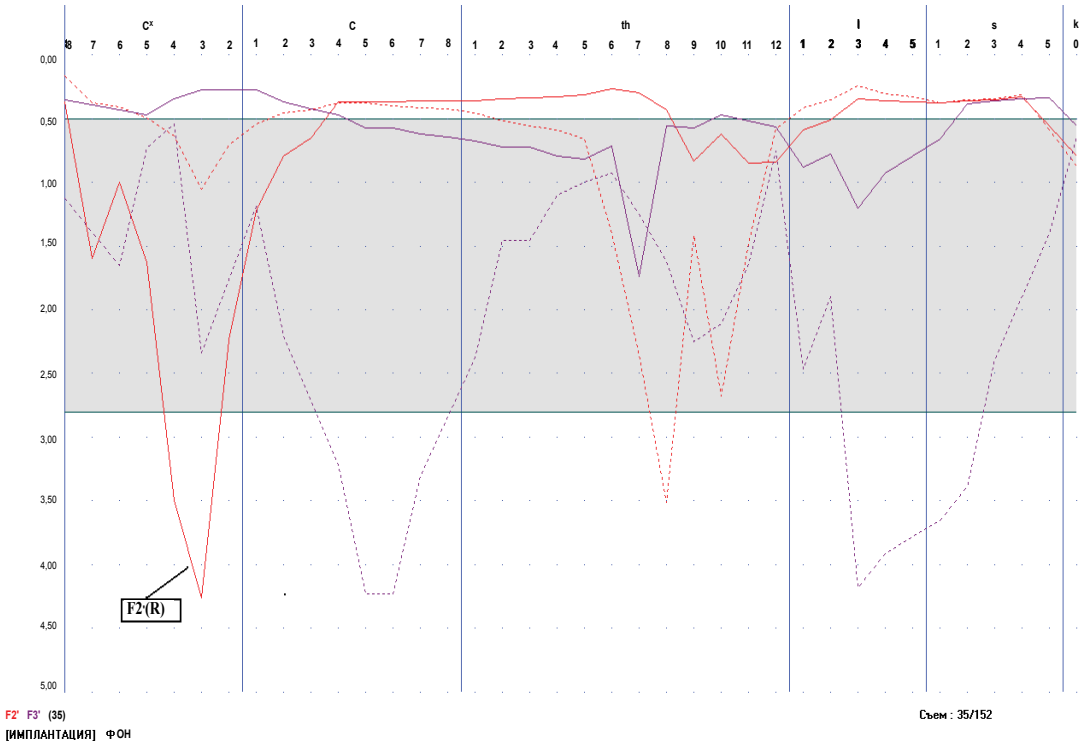


Figure 1 Pictorial representation of computer-aided examination before implantation. Base function F2 reflects state of alpha-adrenoceptors of arterial vessels. The patient has stabile ischemic hypoxia of maxilla-facial area (4.3 relative units); the dashed area shows normal values (up to 2.5 relative units); C* segments is maxilla-facial area.

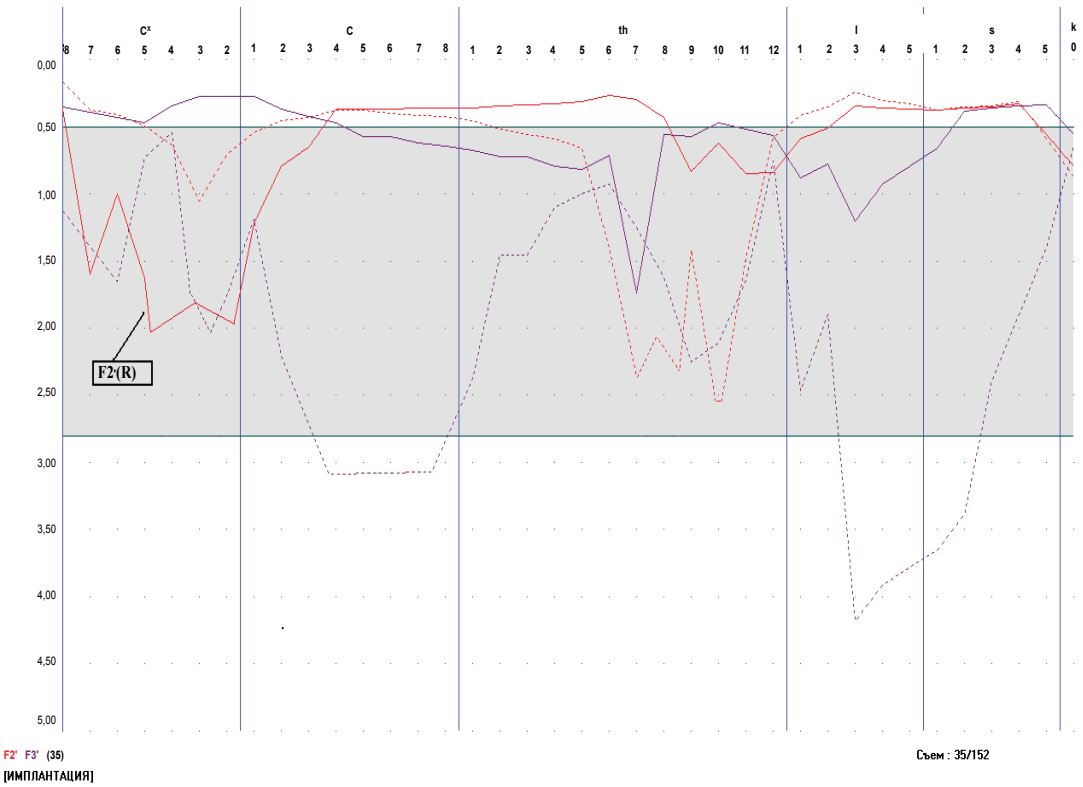


Figure 2 Pictorial representation of computer-aided dermography after the course of physiotherapy. Base function F2 reflects state of alpha-adrenoceptors of arterial vessels. The patient's blood circulation in the maxilla-facial area has normalized (2.0 relative units); the dashed area reflects normal values (up to 2.5 relative units); C* segments is maxilla-facial area.

Lower jaw		Upper jaw			
		On the right		On the left	
Tooth No.	Indicator	Tooth No.	Indicator	Tooth No.	Indicator
4.1	-3 (0.0375)	1.1	-3 (0.0375)	2.1	-3 (0.0750)
4.6	-5 (0.0625)	1.3	-3 (0.0375)	2.3	-5 (0.0625)
4.7	-5 (0.0625)	1.4	-3 (0.0375)	2.4	-5 (0.0625)
3.1	-5 (0.0625)	1.5	-2 (0.0250)	2.6	-3 (0.0750)
3.6	-5 (0.0625)	1.6	-2 (0.0250)		
3.7	-6 (0.0750)				

Table 2 Results of examination of implant lability in relative units (scale of values from -8 to 0-positive indicators; from 0 to +9-negative indicators that require clinical control. Values from +9 and greater indicate that an implant is not surrounded with bone tissue). One relative unit corresponds to 0.0125 mm.

Porcelain fused prosthetic teeth were manufactured for the upper jaw (cement retention). A porcelain-fused overdenture was manufactured for her lower jaw for 6 implants with screw structure.

As a result of the performed work they can state the following:

1. Installation of implants and further installation of prosthetic teeth helped restore chewing function of the **patient M.**
2. Facial asymmetry has been eliminated, facial profile has been evened.
3. Nasal labial folds have been reduced, lips are no longer sunken.
4. Wrinkles on the patient's lips and nasal labial folds have reduced.
5. Ischemic hypoxia has been eliminated, blood circulation in the maxilla-facial area has been normalized- from 4.3 to 2.0 relative units.
6. Muscle gripes (blocks) tested using micro kinesitherapy method that resulted from installation of implants and effect of anesthesia have been eliminated.
7. The patient M. is completely satisfied with the result. Now she communicates with other people without restraints and smiles.