

MINISTRY OF EDUCATION AND SCIENCE
OF THE RUSSIAN FEDERATION
Federal State Budgetary Educational Institution
of Higher Education
«I.N. Ulianov Chuvash State University»

N.S. Fedorova
V.N. Viktorov

DENTAL ORTHOPEDIC REHABILITATION
OF PATIENTS WITH COMPLETELY
ABSENT DENTITION

Educational and methodical manual

Cheboksary
2022

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное бюджетное
образовательное учреждение высшего образования
«Чувашский государственный университет имени И.Н. Ульянова»

Н.С. Федорова
В.Н. Викторов

СТОМАТОЛОГИЧЕСКАЯ ОРТОПЕДИЧЕСКАЯ
РЕАБИЛИТАЦИЯ ПАЦИЕНТОВ
С ПОЛНЫМ ОТСУТСТВИЕМ ЗУБОВ

Учебно-методическое пособие

Чебоксары
2022

UDC 616.314.089.23(075.8)

BCU R668ya73

F33

Reviewers:

Doctor of Medical Sciences, Associate Professor, Rector of the State Autonomous Institution of the Chuvash Republic of Supplementary Professional Education "Post-Graduate Doctors' Trainig Institute" under the Public Health Ministry of the Chuvash Republic *R.S. Matveev*;

Candidate of Medical Sciences, Associate Professor, Head of Maxillofacial Surgery and Dentistry Department at FSBEI of HE "I.N. Ulianov ChuvSU" *V.V. Trubin*

Fedorova N.S.

F33 Dental orthopedic rehabilitation of patients with completely absent dentition: educational and methodical manual / N.S. Fedorova, V.N. Viktorov. – Cheboksary: Chuvash University Publishing, 2022. – 104 p.

ISBN 978-5-7677-3471-9

The study guide is devoted to one of the main sections in orthopedic dentistry – prosthetics of patients with completely absent dentition. The etiological factors leading to this pathology are considered in detail; clinical manifestations, current classifications are given, the clinical and laboratory stages of manufacturing complete removable prostheses are described in detail and illustrated with color photographs and diagrams. The final section of the textbook is devoted to patients' adaptation to complete removable prostheses and possible reactions of prosthetic bed tissues to the use of complete removable prostheses made of acrylic polymers.

Responsible editor Doctor of Medical Sciences, Professor Yu.N. Urukov

Approved by the Educational and Methodological Council of the University

UDC 616.314.089.23(075.8)

BCU R668ya73

© Chuvash University Publishing, 2022

© Fedorova N.S., Viktorov V.N., 2022

ISBN 978-5-7677-3471-9

УДК 616.314.089.23(075.8)

ББК Р668я73

Ф33

Рецензенты:

Р.С. Матвеев – д-р мед. наук, доцент, ректор ГАУ ДПО «Институт усовершенствования врачей» Минздрава Чувашии;

В.В. Трубин – канд. мед. наук, доцент, зав. кафедрой челюстно-лицевой хирургии и стоматологии ФГБОУ ВО «Чувашский государственный университет имени И.Н. Ульянова»

Федорова Н.С.

Ф33 Стоматологическая ортопедическая реабилитация пациентов с полным отсутствием зубов: учеб.-метод. пособие / Н.С. Федорова, В.Н. Викторов. – Чебоксары: Изд-во Чуваш. ун-та, 2022. – 104 с.

ISBN 978-5-7677-3471-9

Детально рассмотрены этиологические факторы, приводящие к патологии полного отсутствия зубов, и ее клинические проявления. Представлены действующие в настоящее время классификации, подробно изложены и проиллюстрированы цветными фотографиями и схемами клинко-лабораторные этапы изготовления полных съемных протезов. В заключительном разделе пособия изложены вопросы адаптации пациентов к полным съемным протезам и возможным реакциям тканей протезного ложа на применение полных съемных протезов, изготовленных из полимеров акрилового ряда.

Для студентов IV–V курсов, ординаторов и врачей.

Ответственный редактор д-р мед. наук, профессор Ю.Н. Уруков

Утверждено Учебно-методическим советом университета

УДК 616.314.089.23(075.8)

ББК Р668я73

© Издательство Чувашского
университета, 2022

© Федорова Н.С., Викторов В.Н., 2022

ISBN 978-5-7677-3471-9

PREFACE

This training manual conforms to the Federal State Educational Standard of Higher Education in the specialty "Dentistry "(order of the Ministry of Education and Science of the Russian Federation № 984 dated 12.08.2020) and is intended for conducting practical classes for students of dental faculties in the section of orthopedic dentistry "Prosthetics of patients with completely absent dentition".

Complete absent dentition is one of the urgent problems in modern dentistry. Some authors state that this process is the result of a decrease in the birth rate, an increase in the mortality of working age people, and, as a result, an increase in the number of elderly and senile population. Other scientists associate natural aging of the population with an increase in longevity, which was facilitated by the progress of science and reforms of the health system, allowing for early diagnosis and treatment of somatic diseases, which are still the main cause of death of the population.

In European countries, the interest in studying the nation's aging process arose in the 80-90 years of the XX century. In Germany, the share of elderly people over 65 years of age in the 90s of the twentieth century was 15.4%, and by 2025 it was expected to increase to 23%. The same indicator for the same time period in the UK was 15.8%, the prognosed increase by 2025 is to 21.5%. On average, in the EU countries, it is expected that by 2040, 30% of the population will be made by people over 60 years old.

In the Russian Federation, according to the materials of the international seminar on the health issues of older people, the share of people aged 60 years and older in 1994 was 16.7%, by 2000 it exceeded 30%, and by 2055 it is expected to increase to 55% of the total population (Leontiev V.K., 2004).

Thus, it can be stated that the steady trend of population aging that has formed over the past century requires a deep and comprehensive study.

The educational material consistently presented in this training manual will help students to master the basic level of the subject and successfully pass the exam in orthopedic dentistry.

Lesson 1
COMPLETELY ABSENT DENTITION.
ETIOLOGY. CLINICAL MANIFESTATIONS. CHANGES
IN THE MAXILLOFACIAL REGION IN PATIENTS
WITH COMPLETELY ABSENT DENTITION

The purpose of the lesson:

- etiological factors that lead to complete loss of teeth;
- clinical manifestations of the complete absence of teeth, reflected both on the patient's face and in the oral cavity;
- anatomical and physiological features of the bone tissue in edentulous jaws;
- anatomical and physiological features of the oral mucosa in patients with complete absence of teeth.
- mastering the methods of examining the patients with completely absent dentition.

Demonstration by an assistant

1. Examination of the face, palpation of the skin, the area of the temporomandibular joint, jaw bones, angles of the lower jaw, visual analysis of the opening of the mouth, movement of the lower jaw.
2. Examination of the soft tissues in the oral cavity, the tongue, mucous membrane, palpation of the mucous membrane of the bony jaw base.
3. Determination of pain sensitivity in various zones of the mucous membrane of the prosthetic bed (esthesiometry).
4. Analysis of sound production.
5. Taking impressions from edentulous jaws to make custom trays.

Control questions for checking the initial level of knowledge

1. Anatomical structure of the upper and lower jaw.
2. Features of the anatomical structure of edentulous jaws.
3. The scheme of examining patients in the clinic of orthopedic dentistry.
4. The clinical picture of patients' emotional stress at an appointment with an orthopedic dentist.
5. Principles of patients' psychological preparation before dental treatment.

Control questions on the theme of the lesson

1. The aims of orthopedic treatment of patients with completely absent dentition.
2. Local factors that result in a complete absence of teeth.
3. Local factors that result in a complete absence of teeth.
4. Changes in the facial skeleton in completely absent dentition.
5. The mechanism of development of senile progeny.
6. Classifications of edentulous jaws by Kehller, Schroeder.
7. Determining morphological features of hard and soft tissues of the prosthetic bed.
8. Assessing the state of the mucous membrane of the prosthetic bed of edentulous jaws. Classification of the mucous membrane types in the prosthetic bed by Supple.
9. Determining the zones of compressibility by Lund.

Dental orthopedic rehabilitation of patients with complete adentia is a complex problem of creating dentures that are full-fledged in functional and aesthetic terms.

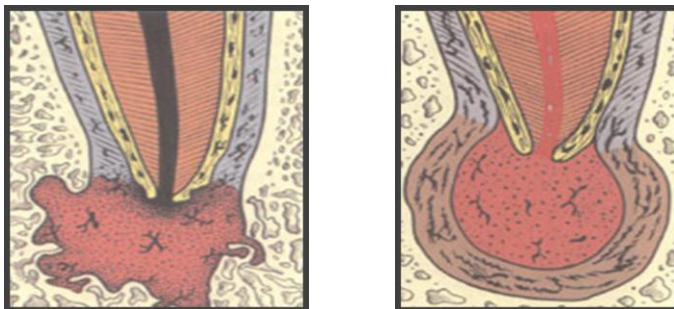
Significant or complete loss of teeth is most common at the age of 60 years and older. At the age of 40 years and older, this pathology is observed only in 15% of people [1].

The most common cause of complete secondary adentia development is tooth decay and its complications. The justified reasons for tooth extraction due to complicated caries are complete demineralization of the hard dental tissues, and the destruction of its crown part, which cannot be restored by pin-type orthopedic structures (Fig. 1).



*Figure 1. Etiology. Local factors.
Complications of carious lesions of hard dental tissues [2]*

The next cause of possible tooth loss can be called chronic periodontitis, granulating and granulomatous forms of which are characterized by the presence of a focus of periapical tissues destruction of 10 mm or more, with impossibility of complex treatment and full-fledged filling of the root canal (Fig. 2).



*Figure 2. Etiology. Local factors.
Complications of carious lesions of hard dental tissues [2]*

Quite often, the local factors preceding the development of complete secondary adentia are parodontal diseases: acute and chronic parodontites and chronic parodontal disease. In these diseases, as a rule, in a short time period, the functional groups of teeth characterized by the third and fourth degrees of mobility are extracted (Fig. 3).



Figure 3. Etiology. Local factors. Parodontal diseases [4]

Non-carious lesions of the teeth, such as erosive and destructive forms of fluorosis, enamel aplasia, as a manifestation of systemic enamel and dentin hypoplasia, necrosis of hard dental tissues, chemical (acid) necrosis, computer, radiation ones, can also serve as a local cause of complete secondary adentia (Fig. 4).



*Figure 4. Etiology. Local factors.
Non-carious lesions of hard dental tissues [5, 6]*

To a lesser extent, local etiological factors of complete secondary adentia can be mechanical trauma of the teeth, trauma of the teeth and alveolar processes on one or more jaw bones and surgical interventions accompanied by tooth extraction and resection of the alveolar processes in the jaw bones.

Common factors leading to complete secondary adentia include, first of all, diseases of the endocrine system (diabetes mellitus, Itsenko-Cushing's disease, etc.), systemic connective tissue diseases, blood diseases, radiation sickness, manifested by parodontal syndrome, resulting in a rapid loss of teeth (Fig. 5).

Primary (congenital) adentia caused by malformations of the dental system is observed very rarely.

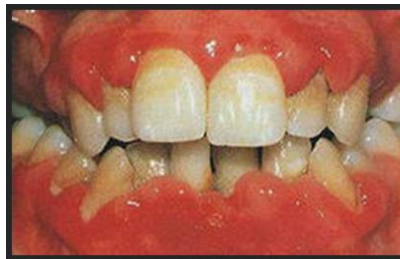


Figure 5. Etiology. Common factors. Parodontal syndrome [7]

The clinical presentation of an edentulous mouth depends on the cause of teeth loss, the time that has passed since their extraction, the age of the patient and a number of other purely individual characteristics of the body. The patient's examination should start with an external examination of the patient. The face of a patient

with complete adentia has a so-called "senile facial expression", which implies a decrease in the height of the lower third of the face, development of flabby muscles, appearance of vertical wrinkles around retracted lips, lowering the corners of the mouth, the tip of the nose, the outer corners of the eyes, pronounced nasolabial and chin folds, mandibular prominence and the formation of one of the main facial symptoms of complete adentia "senile progenia" (Fig. 6).



Figure 6. Reconstruction of the maxillofacial region organs due to the complete adentia. Patients' appearance

In complete loss of teeth, along with aesthetic transformations, one can also observe functional changes in the maxillofacial region, which are manifested in difficulty in nasal breathing, impaired sound reproduction and speech, lack of full-quality chewing of food and, as a result, the development of digestive diseases.

One of the characteristic facial symptoms of complete adentia is forward mental prominence, the so-called "senile progenia", which is characterized by a change in the ratio of the jaws in the transversal direction (Fig. 7).

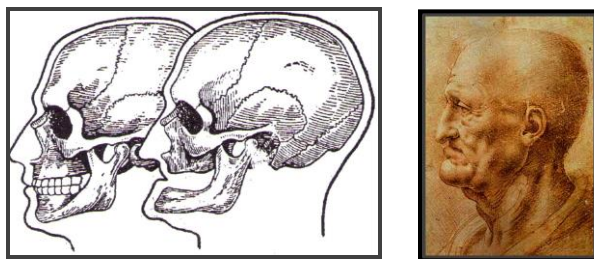


Figure 7. Senile progenia [8, 9]

The mechanism of formation can be represented as follows. In orthopedic dentistry, it is customary to distinguish, in addition to the dental arch, alveolar and basal ones. The alveolar arch means a line drawn along the jaw ridge bone. The basal arch runs along the tops of the roots. Since the crowns on the upper jaw are inclined outward, and the roots are inclined inward, the dental arch of the upper jaw is wider than the alveolar and basal arches. On the lower jaw, on the contrary, due to inclination of the dental crowns inward, and the roots – outward, the dental arch of the lower jaw is narrower than the alveolar and basal arches. For this reason, due to the loss of teeth, the wide alveolar arch of the lower jaw overlaps the narrower alveolar arch of the upper jaw, which is accompanied by the protrusion of the lower jaw forward and the creation of a protrusive ratio of edentulous jaws. In addition, the vestibular surface of the alveolar process undergoes more atrophy in the upper jaw, and the lingual one on the lower jaw, i.e. the upper alveolar arch becomes even narrower, while the mandibular one expands (Fig. 8).

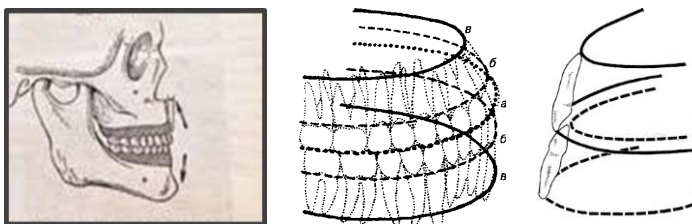


Figure 8. The mechanism of senile progenia development [10]

Progressive bone atrophy involves not only the alveolar processes of the jaw bones, but the elements of the temporomandibular joint as well. The articular fossa becomes sloping, and the head of the lower jaw becomes of a cylindrical shape. The articular heads displace posteriorly and upward, which inevitably leads to a change in the shape of the articular disk. Deformation of all temporomandibular joint elements is based on functional overload and leads to the development of deforming arthrosis (Fig. 9).

In complete loss of teeth, the function of masticatory muscles changes. As a result of reduced load, the muscles decrease in volume, become flabby and atrophy.

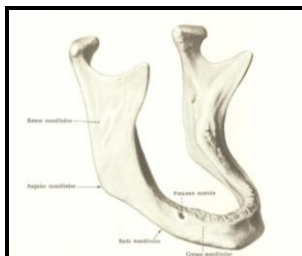


Figure 9. Reconstruction of the maxillofacial region organs due to the complete edentulism [11]

After tooth extraction, the alveolar processes of the jaw bones are usually well pronounced, but they atrophy over time.

To assess the condition of the bone tissue in an edentulous jaws, various classifications are used, which are based on the magnitude, nature of bone atrophy and changes in the mucous membrane associated with this process.

Schreder (H. Schreder, 1927) distinguishes three types of edentulous maxillas. The first type is characterized by a well-preserved alveolar process, well-pronounced alveolar tubercle and a high palatine vault. The transitory fold and the places of attachment of the frenula and masticatory muscles are located relatively high. The prognosis of prosthetics success for this type of edentulous jaws is very favorable (Fig. 10).



Figure 10. Classification of edentulous jaws by Schroeder. Type 1 [12]

In the second type, a medium degree of the alveolar process atrophy is observed: the alveolar tubercles are preserved and moderately developed; the palatal arch is clearly expressed, but it is

somewhat flattened, the transverse folds of the hard palate are smoothed; the transitory fold is located somewhat closer to the top of the alveolar process; a not high attachment of the frenula and folds is characteristic. The prognosis of prosthetics success for this type of edentulous jaws is very favorable (Fig. 11).



Figure 11. Classification of edentulous jaws by Schroeder. Type 2 [13]

The third type of the maxilla is characterized by pronounced atrophy: there are no alveolar processes and tubercles. The hard palate is flat; the relief of the palatal folds is completely absent. The transitory fold is located in the same horizontal plane with the hard palate. The prognosis of prosthetics success for this type of edentulous jaws is unfavorable (Fig. 12).



Figure 12. Classification of edentulous jaws by Schroeder. Type 3 [14]

Kehller (Kehller, 1929) distinguishes four types of edentulous mandibles. In the first type, the alveolar processes are insignificantly and evenly atrophied. At this an evenly rounded alveolar ridge is a good base for the prosthesis and restricts the freedom of its movement when it shifts forward and laterally. The attachment points of the muscles and mucous membrane folds are located at the base of the alveolar process (Fig. 13).

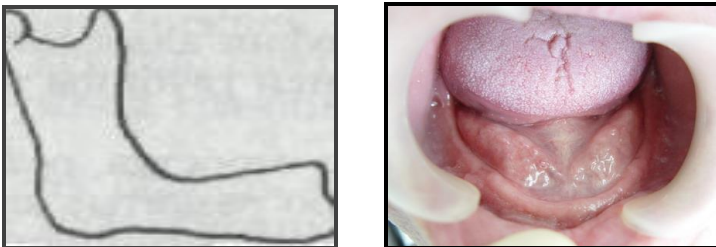


Figure 13. Classification of edentulous jaws according to Kehller. Type 1 [15, 16]

In the second type, there is a pronounced but uniform atrophy of the alveolar process. At this, the alveolar ridge barely rises above the bottom of the oral cavity, representing a narrow formation in the anterior part. The places of muscles' attachment are located almost at the level of the ridge (Fig. 14).

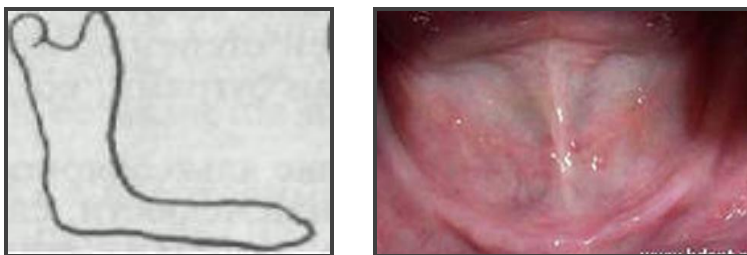


Figure 14. Classification of edentulous jaws according to Kehller. Type 2 [17]

The third type is characterized by a pronounced atrophy of the alveolar process in the lateral sections with a relatively preserved one in the anterior section (Fig. 15).

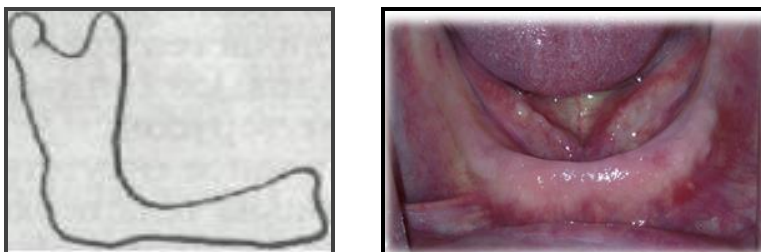


Figure 15. Classification of edentulous jaws according to Kehller. Type 3 [18]

In the fourth type, atrophy of the alveolar process is the most pronounced in the anterior part, with relative preservation in the lateral parts of the mandible (Fig. 16).

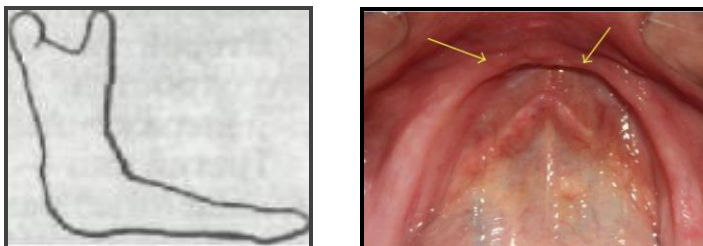


Figure 16. Classification of edentulous jaws according to Kehller. Type 4 [19]

Changes that develop in the oral cavity after tooth extraction involve not only the alveolar processes, but the oral mucosa as well.

Supple was one of the first to publish a general description of the prosthetic bed mucosa from a clinical standpoint. He distinguished four classes.

Class 1 – normal mucous membrane: pink, dense, moderately pliable and moist – "an ideal prosthetic bed" (Fig. 17).



Figure 17. Characteristics of the oral mucosa (Supple's classification). 1st class [20]

Class 2 – atrophied mucous membrane: pale pink, thin, dry, easily susceptible to injury – "hard prosthetic bed" (Fig. 18).



Figure 18. Characteristics of the oral mucosa (Supple's classification). 2nd class [21]

Class 3 – hypertrophied mucous membrane: hyperemic, loose, moist, forms additional folds and strands, with signs of catarrhal inflammation – "soft mouth" (Fig. 19).



Figure 19. Characteristics of the oral mucosa (Supple's classification). 3rd class [22]

Class 4 – a freely movable mucous membrane, full-blooded, resembling a cock's "flabby ridge" (Fig. 20).



Figure 20. Characteristics of the oral mucosa (Supple's classification). 4th class [23]

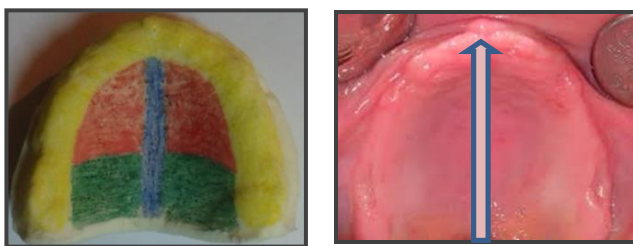
Of course, none of the available classifications claims to be an exhaustive description of edentulous jaws. However, their use is convenient as a tool for describing existing clinical changes.

A scheme for describing the diagnosis in complete secondary adentia. Edentulous maxilla of type by Schroeder, edentulous mandible of type by Kehller. The mucous membrane of the class by Supple. Functional and aesthetic disorders of the maxillofacial region that are the result of a complicated carious process (diseases of the hard dental tissues of a non-carious nature, periodontal diseases, etc.).

Most researchers associate pliability of the mucous membrane of the hard palate and alveolar processes with the structural features of the submucosal layer, depending on the size of adipose and glandular tissue in it.

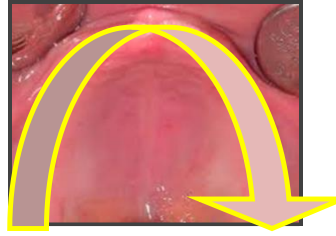
The mucous membrane covering the maxilla has a different degree of compressibility, the limits of oscillation of which are from 0.2 to 4 mm, deduced by Shtrenge by an experimental method, allowed Lund to distinguish four zones:

The area of the sagittal palatine suture. The median fibrous zone has a minimal degree of compressibility, due to fusion with the periosteum (Fig. 21).



*Figure 21. Zones of the oral mucosa compressibility by Lund.
The median fibrous zone.*

The area of the alveolar process and the adjacent zone. The peripheral fibrous zone is covered with a mucous membrane with a thin submucosal layer and, as a result, has an insignificant degree of mobility (Fig. 22).



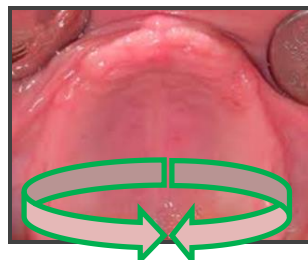
*Figure 22. Zones of the oral mucosa compressibility by Lund.
The peripheral fibrous zone.*

The anterior part of the hard palate. The zone of transverse folds or the fat zone is covered with a mucous membrane having a submucosal layer of 1-2 mm thick and is characterized by moderate compressibility (Fig. 23).



Figure 23. Zones of the oral mucosa compressibility by Lund. The fat zone

The posterior part of the hard palate has a submucosal layer rich in glandular tissue. The mucous membrane of this zone has the highest degree of compressibility (Fig. 24).



*Figure 24. Zones of the oral mucosa compressibility by Lund.
Glandular zone*

A minimum of manipulations. Examination of a patient with completely absent teeth

1. Taking a dental history. During the examination of the patient, the dentist should pay attention to the facial expressions of the patient, changes in the configuration of the face associated with the loss of teeth, features of diction. It is important to establish the cause of teeth loss and the time of their extraction, to find out the prosthetic status of patients: if the patient has the experience in using orthopedic structures, and if so, what are his wishes for new prostheses.

2. Facial examination:

- face type (triangular, square, round);
- maxilla (retraction of the upper lip, intensity of nasolabial folds (moderate, sharp);
- lower jaw (retraction of the lower lip, protrusion of the chin, intensity of the mental area);
- the height of the lower facial third (reduced, not reduced, increased).

3. Oral examination:

- the mucous membrane (mobile, immobile, pliable, rigid, upper lip frenula, lower lip frenula, the tongue, buffer zones, transitory fold, "A" line, valvular zone, classification of mucosa type by Supple, zones of mucosal compressibility by Lund;
- alveolar processes of the jaws (height, relief, shape, vestibular slope, alveolar tubercles, maxillofacial line, sublingual torus, types of atrophy);
- hard palate (shape of the arch, depth of the palate);
- the tongue and sublingual salivary glands (the size of the tongue (enlarged, not changed), location of the sublingual salivary glands relative to the alveolar process of the lower jaw);
- sublingual space (pronouncement of topography);
- the ratio of edentulous jaws (orthognathic, progenic, prognathic).

Lesson 2

METHODS OF FIXING AND STABILIZING REMOVABLE DENTURES IN COMPLETELY ABSENT DENTITION

The purpose of the lesson – to familiarize dental students with possible methods of fixing and stabilizing complete removable prostheses. To study the mechanism of anchoring prostheses on edentulous jaws.

Control questions for checking the initial level of knowledge

1. Anatomical features of the structure of an edentulous maxilla.
2. Anatomical features of the structure of an edentulous mandible.
3. Morphological features of the structure of the oral mucosa.

Control questions on the theme of the lesson

1. Definition of the concept of "Fixing a complete removable prosthesis".
2. Definition of the concept of "Stabilization of a complete removable prosthesis".
3. Methods of fixing and stabilizing complete removable prostheses.
4. Characteristics of mechanical fixation methods.
5. Characteristics of biomechanical fixation methods.
6. Characteristics of physical fixation methods.
7. Characteristics of biophysical fixation methods.

Fixation is a state of immobility of complete removable prostheses at rest. Stabilization is the state of immobility of complete removable prostheses when functioning. The strength of the prosthesis fixation depends on the anatomical conditions present in the patient's oral cavity, the type of his mucous membrane and the method of obtaining an impression.

B.K. Boyanov classified the methods of fixing complete removable prostheses as mechanical, biomechanical, physical and biophysical.

Modern mechanical methods of fixation include weighting of a complete removable prosthesis on the mandible by introducing metals with a high specific gravity into its base.

The biomechanical methods of fixing complete removable prostheses are based on the use of natural anatomical structures. Anatomical retention involves the use of gingival clasps and pelottes (Fig. 25).

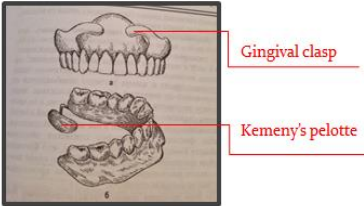
ANATOMICAL STRUCTURES OF THE MAXILLA	ANATOMICAL STRUCTURES OF THE MANDIBLE
✓ well-marked alveolar processes; ✓ well-marked alveolar tubercles; ✓ high hard palate; ✓ well-marked transverse folds of the hard palate.	✓ well-marked alveolar parts; ✓ deep sublingual space. 

Figure 25. Anatomical retention [24]

Biomechanical methods of fixation include plastic surgery of the alveolar ridge and the use of various implant designs installed to fix complete removable prostheses (Fig. 26).



Figure 26. Biomechanical methods of fixing complete removable prostheses

The physical methods of fixing complete removable prostheses include the use of magnets. In the lateral sections of the prostheses, two U-shaped magnets are placed, directed to each other by analogous poles. The force of magnets' repulsive action presses the prostheses to the jaws like the action of springs.

Opposite poles magnets are used in conjunction with subperiosteal implants. Charged magnet poles are installed as a

subperiosteal implant, the opposite pole is placed in the basis of a complete removable prosthesis (Fig. 27).

Recently, magnets from R-Co have been started to be applied. They do not become demagnetized, have resistance to corrosion in saliva and are biologically indifferent. Recent studies of scientists have shown that magnetic fields are harmless to the organs and tissues of the oral cavity.

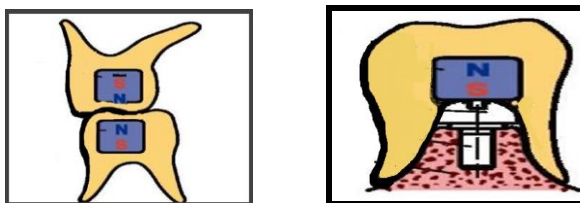


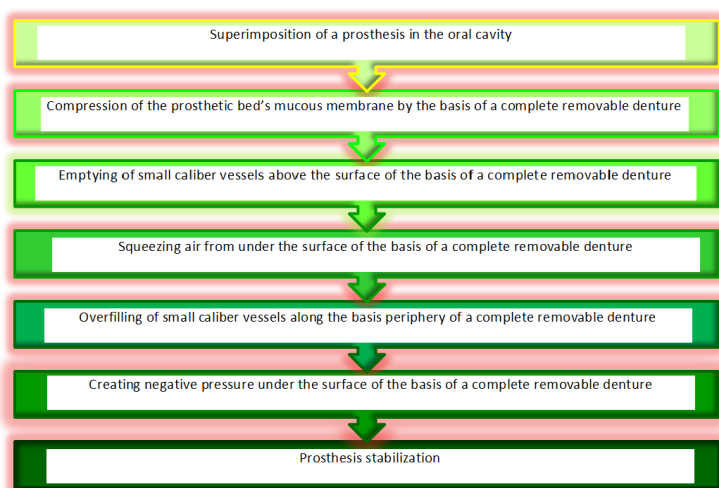
Figure 27. Physical methods of fixing complete removable prostheses. The use of magnets [25]

Also, such a phenomenon as adhesion (stickiness) can be related to physical methods of fixation. Adhesion is the force of intermolecular interaction that causes bonding of two solids, in our case, we mean the intermolecular interaction between the inner surface of the prosthesis base and the tissues of the prosthetic bed. In order for the adhesion mechanism to take place, certain conditions must be observed: coincidence of micro and macro-reliefs of the inner surface in the prosthesis base and the tissues of the prosthetic bed, the minimum space between these surfaces is 0.007 microns, the presence of an adhesive (saliva) between the solids, which provides a physical phenomenon – wettability, based on the fact that the forces of intermolecular adhesion inside the adhesive (saliva) are less than the forces of intermolecular interaction between the molecules of the adhesive and the molecules of the solid, as a result, the inner surface of the prosthesis base is wetted with a thin layer of adhesive (saliva), which is distributed in the form of a concave meniscus, and, trying to straighten out, presses the prosthesis against the mucous membrane of the prosthetic bed.

The biophysical method of fixing complete removable prostheses is based on the principle of creating a vacuum space over the entire surface of the prosthesis base. In order for this mechanism to take place, it is necessary to create a valve zone – this is a tight contact zone between the mucous membrane of the transitory fold,

the posterior surface of the hard palate (line A) on the upper jaw and the bottom of the oral cavity on the lower jaw and the outer edge of the basis of a complete removable prosthesis.

When applying a complete removable prosthesis in the oral cavity, the mucous membrane of the prosthetic bed is pressed and air is squeezed out from under the prosthesis surface, the mucous membrane of the transitory fold, due to its compressibility, covers the outer edge of the prosthesis base and forms an edge closing valve. At this, a vacuum space is formed between the inner prosthetic surface and the mucous membrane of the prosthetic bed, and the prosthesis is fixed due to the difference in atmospheric pressure (Fig. 28).



*Figure 28. Biophysical method of fixing complete removable prostheses.
Creating an edge closing valve*

Thus, we can conclude that fixation and stabilization of complete removable prostheses can take place only in a successful combination of all the above mechanisms. The one which can be called the main is creation of a vacuum space under the entire surface of the basis of a complete removable prosthesis (creation of an edge closing valve). Auxiliary mechanisms: anatomical retention, adhesion, wettability and the use of various implant designs also significantly increase the probability of successful orthopedic rehabilitation of patients with completely absent dentition.

Lesson 3

METHODS OF MANUFACTURING INDIVIDUAL BASEPLATE TRAYS [26]

The purpose of the lesson – to familiarize students of the Stomatological Faculty with the methods of making individual baseplate trays.

Demonstration by an assistant

1. Methods of obtaining an anatomical impression.
2. Determining the boundaries of individual baseplate trays on edentulous mandible and maxilla.
3. Clinical stages of manufacturing individual baseplate trays from wax.

Demonstration by a dental technician-laboratory assistant

1. Castings a plaster model based on the resulting anatomical impression.
2. Laboratory stages of mixing of cold-cured resin.
3. Laboratory stages of plastic paste maturation.
4. Laboratory stages of forming an individual baseplate tray made of cold-cured resin.

Control questions for checking the initial level of knowledge

1. Classification of impression materials.
2. Characteristics, indications, advantages and disadvantages of the use of alginate impression materials.
3. Characteristics of polymer fast-hardening materials used for the manufacture of individual baseplate trays.
4. Characteristics of basic waxes used for the manufacture of individual baseplate trays.

Control questions on the theme of the lesson

1. Anatomical and functional formations of the upper edentulous jaw, significant for forming the boundaries of the basis of a complete removable prosthesis.

2. Anatomical and functional formations of the lower edentulous jaw, significant for forming the boundaries of the basis of a complete removable prosthesis.

3. Indications and contraindications for the manufacture of individual baseplate trays made of wax.

It is advisable to start mastering the methods of making individual baseplate trays by studying the features of obtaining anatomical impressions (Scheme 1).

Scheme 1

*Methods of obtaining an anatomical impression.
A minimum of manipulations*

Stages of action	Means of action	Self-control criteria
To choose a standard anatomical tray in an adequate way	Standard anatomical trays	The tray should be easily inserted into the oral cavity, overlapping all anatomical formations
Prepare the impression material for taking the impression	Silicone, alginate, thermoplastic impression masses	The elastic phase of the impression material is achieved
Fill the anatomical tray with impression material, insert it into the oral cavity, draw the edges with the help of cheeks and lips		The tray should be positioned centrally with the mouth closed as much as possible
Wait until completely cured		The mass should become elastic
Remove the tray with the impression from the oral cavity		Without any remaining mass on the mucous membrane
Evaluate the quality of the impression		All anatomical formations are clearly displayed on the impression (Fig. 29)



Figure 29. Clinical and laboratory stages of complete dentures' manufacturing. Taking anatomical impressions

After receiving the anatomical impressions, plaster models are cast in the dental laboratory, on which the boundaries of the bases of complete prostheses are outlined. On the upper jaw, the border is located as follows: on the vestibular surface: not reaching the dome of the transitory fold by 2 mm, bypassing all the frenula and strands of the mucous membrane; on the palatine surface: overlapping the line of transition of the hard palate to the soft palate by 1 mm, blind pits will serve as a clinical guideline (Fig. 30).



Figure 30. The boundaries of a complete denture's basis for the upper jaw

On the lower jaw, the border is located on the vestibular side: not reaching the dome of the transitory fold by 2 mm, bypassing all the frenula and strands of the mucous membrane; in the retromolar region: it overlaps the mandibular tubercle; on the oral side: it overlaps the mylohyoid line; on the lingual side: it overlaps the sublingual space from the first incisor to the first molar of the lower jaw, bypassing anatomical formations (Fig. 31).



Figure 31. Clinical and laboratory stages of complete dentures' manufacturing. The boundaries of the bases of complete prostheses

Currently, in the practice of orthopedic dentistry, there are several ways to make individual baseplate trays:

- clinical method of making an individual baseplate tray from wax;
- laboratory method of making an individual baseplate tray from acrylic resin cement on a plaster model;
- laboratory method of manufacturing an individual baseplate tray by compression moulding;
- laboratory method of manufacturing an individual baseplate tray by transfer moulding;
- laboratory method of manufacturing individual baseplate trays from standard light-curing polymers;
- laboratory method of manufacturing individual baseplate trays by vacuum pressing.

The clinical method of making an individual baseplate tray involves its formation at a clinical visit, without a dental technician's participation (the method of G.B. Brahman).

Manufacturing an individual baseplate tray made of wax on the upper edentulous aw. The base wax plate is heated and folded along the length in three layers, sharp corners are cut off, heated, introduced into the oral cavity and a tray is carefully formed, pressing the plastic wax to the surface of the prosthetic bed. After the preliminary formation of an individual baseplate tray, it is removed from the oral cavity and the visible excess of wax is cut off. The procedure of sequential heating and forming the boundaries of the tray is carried out several times until an individual baseplate tray is obtained with surfaces and borders that repeat the contours of the prosthetic bed tissues.

Manufacturing an individual baseplate tray made of wax on the lower edentulous jaw. The base wax plate is heated and folded in three layers along the width, after which the wax plate is given a horseshoe shape and it is introduced into the oral cavity, laying along the alveolar ridge. Making the edges of the wax baseplate tray is carried out with the mouth half-closed in the same order as on the upper jaw. An individual baseplate tray made of wax for the lower edentulous jaw must be strengthened with a wire. For this purpose, the wire is heated, immersed in the surface wax layers and covered with a small wax roller along the entire length of the wire laid.

Making individual baseplate trays from self-hardening acrylic resin. On plaster models of edentulous jaws where the boundaries of the bases of complete prostheses are drawn, a layer of insulating (separating) varnish is applied. Plates are formed from plastic resin in the dough-like stage, which are placed on plaster models and individual baseplate trays are modeled. A handle with a length from a canine to another canine is formed perpendicular to the surface of the tray. After resin polymerization (10-15 minutes), the tray is removed from the model and processed with cutters and stones. The thickness of the tray edge should be at least 1.5 mm, for further formation of the functional impression's volume (Fig. 32).



Figure 32. Clinical and laboratory stages of complete dentures' manufacturing. Making individual baseplate trays from self-hardening acrylic resin

Making individual baseplate trays by compression moulding. The dental technician heats a plate of base wax and tightly compresses it according to the model, cutting off the excess along the measured boundaries. A handle is modeled on the tray perpendicular

to the surface of the tray. The wax form of an individual baseplate tray, together with the model, is cast in the reverse way into a flask, where the wax is replaced with hot-curing acrylic resin (Fig. 33). After resin polymerization (30-45 minutes), the tray is removed from the model and processed with cutters and stones.

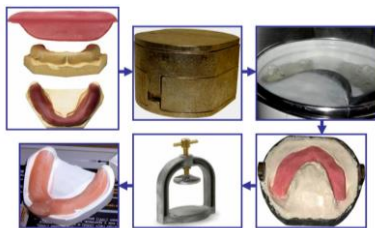


Figure 33. Making individual baseplate trays by compression moulding [26]

Making individual baseplate trays by transfer moulding. The dental technician heats a plate of base wax and tightly compresses it according to the model, cutting off the excess along the measured boundaries. A handle is modeled on the tray perpendicular to the surface of the tray. A plaster model with a wax construction is cast in a flask. The resin is fed into the flask by a system of wax gate sprues. After resin polymerization the tray is removed from the model and processed with cutters and stones (Fig. 34).



Figure 34. Making individual baseplate trays by transfer moulding [27]

Making individual baseplate trays by vacuum moulding. The thermoplastic material is fixed in the frame of the heater, the frame begins to descend, this activates a vacuum pump that creates a

negative pressure under the plate of the thermoplastic material, as a result of which the model finds itself is tightly compressed by the resin. A cooled individual baseplate tray is removed from the plaster model and cut according to the boundaries of the complete denture basis with cutters and stones (Fig. 35).

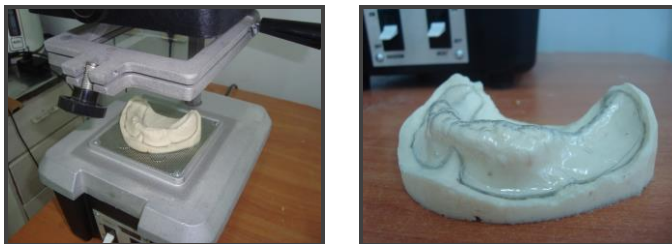


Figure 35. Making individual baseplate trays by vacuum moulding

Production of individual baseplate trays from standard light-curing materials. A dental technician compresses a standard plate of light-curing material according to plaster models, cuts off excess material according to the outlined boundaries of the prosthesis base and polymerizes the manufactured structure in a special block.

Production of an individual baseplate tray made of cold chemical polymerization resin

A minimum of manipulations:

- delineation of the boundaries of the denture basis, according to anatomical landmarks;
- mixing the cold chemical polymerization resin;
- analysis of successive phases in maturation of cold chemical polymerization resin;
- modeling of an individual baseplate tray on a plaster model made of resin paste;
- mechanical processing of the finished individual baseplate tray;
- analysis of errors that occurred during the manufacture of individual baseplate trays.

Lesson 4

FITTING OF INDIVIDUAL BASEPLATE TRAYS. FUNCTIONAL TESTS USING HERBST'S METHOD

The purpose of the lesson – to familiarize students of the Faculty of Dentistry with the methods of stabilizing custom trays in the oral cavity of patients with completely absent dentition.

Control questions for checking the initial level of knowledge

1. Anatomical features of edentulous jaws, significant for constructing the boundaries of the bases of complete dentures for the upper and lower jaw.
2. Topography of the border of a complete denture for the upper jaw.
3. Topography of the border of a complete denture for the lower jaw.
4. Characteristics, indications, advantages and disadvantages of the use of silicone impression materials. Features of the use of silicone materials of prolonged action.

Control questions on the theme of the lesson

1. The sequence of fitting an individual baseplate tray according to Herbst for the upper edentulous jaw.
2. The sequence of fitting an individual baseplate tray according to Herbst for the lower edentulous jaw.
3. Indications and methods for detailing the boundaries of the bases of complete dentures.

In orthopedic dentistry, fitting individual baseplate trays on edentulous jaws according to Herbst method is the most often used one. The essence of this technique is to achieve stability of an individual baseplate tray in the patient's oral cavity in various physiological movements. Stabilization of the individual baseplate tray is achieved by consistent adjustment of its boundaries.

All Herbst tests are carried out with the mouth half-closed and with a reduced amplitude of movement.

Fitting custom trays in the oral cavity of patients with completely absent dentition

A. FITTING AN INDIVIDUAL BASEPLATE TRAY ON THE UPPER JAW

Fitting of the upper individual baseplate tray begins with detailing the boundaries. The border of the denture's base on the upper jaw passes from the vestibular side, bypassing the frenules and mucous cords, and from behind, overlapping the maxillary tubercles and blind holes by 1-2 mm, passes along the "A" line. The tray is placed on the jaw, its fixation is checked, and then the patient is asked to perform various functional movements.

1. Swallowing saliva

In case of the tray's overturning, the back surface along the "A" line is processed (Fig. 36).

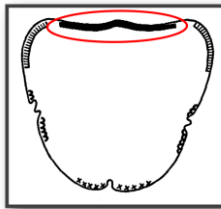
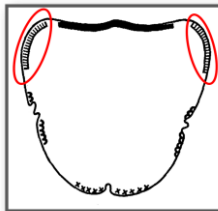


Figure 36. Herbst samples for the upper jaw. Swallowing saliva [28]

2. Wide opening of the mouth

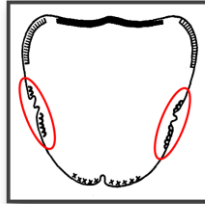
Violation of the tray's fixation is caused by the elongation of the boundaries in the post-molar region from the outside (Fig. 37).



*Figure 37. Herbst samples for the upper jaw.
Wide opening of the mouth*

3. Retraction of the cheeks

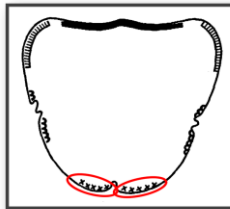
It reveals elongation of the tray's boundaries from the vestibular side in the premolar region (Fig. 38).



*Figure 38. Herbst samples for the upper jaw.
Retraction of the cheeks*

4. Pulling the lips

It reveals elongation of the tray's boundaries from the vestibular side in the frenulum region (Fig. 39).



*Figure 39. Herbst samples for the upper jaw.
Pulling the lips like a tube*

B. FITTING AN INDIVIDUAL BASEPLATE TRAY ON THE UPPER JAW

The tray is placed on the lower jaw, then its fixation is checked, its edges are fitted taking into account Herbst's functional tests.

1. Swallowing saliva

If the tray is dropped when swallowing, it is necessary to shorten its edge behind the mandibular tubercle from the inside to the maxillofacial line (Fig. 40).

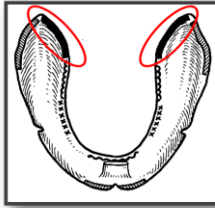


Figure 40. Herbst tests for the lower jaw. Swallowing saliva

2. Wide opening of the mouth

If the tray rises from behind when opening the mouth, it is necessary to shorten its edge from the vestibular side from the mandibular tubercle to the location of the first molar.

If the individual baseplate tray rises in front, then it is shortened from the vestibular side from a canine to the canine (Fig. 41).

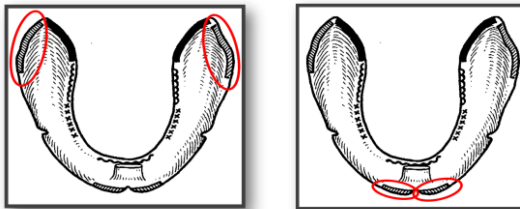


Figure 41. Herbst tests for the lower jaw. Wide opening of the mouth

3. Drawing the tip of the tongue along the vermillion border of the lower lip

If the tray raises, then its edge is shortened along the mandibulohyoid line (internal oblique line) (Fig. 42).

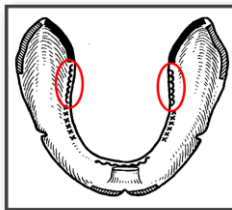


Figure 42. Herbst tests for the lower jaw. Drawing the tip of the tongue along the vermillion border of the lower lip

4. Touching the cheek with the tip of the tongue with the mouth half closed

The tray is shortened from the inside in the area of the premolars (Fig. 43).

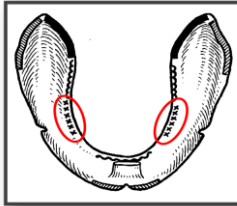


Figure 43. Herbst tests for the lower jaw. Touching the cheek with the tip of the tongue with the mouth half closed

5. Stretching the tongue towards the tip of the nose

Corrections are performed in the area of the lingual frenulum, along the location of the front teeth (Fig. 44).

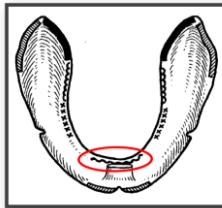


Figure 44. Herbst tests for the lower jaw. Stretching the tongue towards the tip of the nose

6. Pulling the lips like a tube

If the spoon rises, its outer edge should be shortened between the canines (Fig. 45).

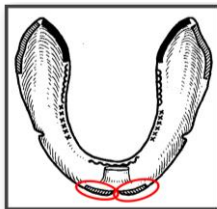
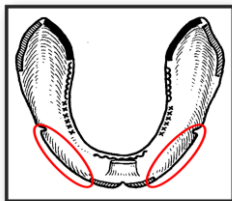


Figure 45. Herbst tests for the lower jaw. Pulling the lips like a tube

7. Active movements of the facial muscles

If the tray is dropped, the tray is shortened from the vestibular side in the premolar region (Fig. 46).



*Figure 46. Herbst tests for the lower jaw.
Active movements of the facial muscles*

For detailing the boundaries of an individual baseplate tray, the method of forming the sides of the tray is used. For this purpose, the edges of an individual baseplate tray, fitted according to the Herbst method, are lengthened with a thermoplastic mass or a silicone impression material of prolonged action. The baseplate tray is inserted into the oral cavity and the above functional tests are carried out sequentially. After polymerization of the material, the baseplate tray is carefully removed from the oral cavity.

Lesson 5
FUNCTIONAL IMPRESSIONS, CLASSIFICATION.
RATIONALE FOR CHOOSING IMPRESSION MATERIALS.
THEIR CHARACTERISTICS. THE METHOD
OF OBTAINING UNLOADING, POSITIVE PRESSURE
AND DIFFERENTIATED IMPRESSIONS

The purpose of the lesson – to teach dental students of the methods of obtaining functional impressions.

Control questions for checking the initial level of knowledge

1. Characteristics, indications for the use of silicone impression materials. Features of their use in prosthetic care of patients with completely absent dentition.
2. Characteristics, indications for the use of thermoplastic impression materials. Features of their use in prosthetic care of patients with completely absent dentition.
3. Assessing the state of the mucous membrane of the prosthetic bed of edentulous jaws. Classification of the mucous membrane types in the prosthetic bed by Supple.

Control questions on the theme of the lesson

1. Definition of the concept of "Functional impression".
2. Classification of impressions according to E.I. Gavrillov.
3. Classification of functional impressions.
4. Definition of the concept of "Positive pressure functional impression". Indications for its use. The technique of its obtaining. Impression materials for its production.
5. Definition of the concept of "Decompression functional impression". Indications for its use. The technique of its obtaining. Impression materials for its production.
6. Definition of the concept of "Differentiated functional impression". Indications for its use. The technique of its obtaining. Impression materials for its production.

After careful fitting the individual baseplate tray, taking a functional impression starts. The main criterion for choosing the type

of functional impression is the features of the structure and functional state of the mucous membrane of the prosthetic bed, which is evaluated according to Supple's classification. It involves planning a rational distribution of the masticatory load under the basis of a complete denture (Scheme 2).

Scheme 2

*Methods of obtaining an anatomical impression.
A minimum of manipulations*

Types of functional impressions	Unloading	Positive pressure impression	Differentiated
Indications	The mucous membrane is thinned, without a submucosal layer, dry. Supple 2, 4	The mucous membrane is dense, well pliable, moist. Supple 1, 3	The mucous membrane is thinned in some areas, while in others it is dense and pliable. Supple 1–4. The presence of exostoses, painful places of blood vessels and nerves exits
Type of a baseplate tray	Perforated in areas of the mucous membrane thinning	Rigid, without perforation	Perforated in places of bone protrusions and painful palpation
Consistency of the impression mass	Plastic, liquid-flowing	Not plastic, non-flowing	In areas that need to be unloaded: – as in the 1st case, and which should be loaded; – as in the 2nd case

A functional impression is an impression that displays in detail the relief of the prosthetic bed tissues during all physiological functions.

Functional impressions are classified into positive pressure, decompression and differentiated.

Positive pressure functional impressions (according to E.I. Gavrilov) is taken under continuous pressure, which ensures compression of the vessels in the mucous membrane of the hard

palate and their emptying. To obtain a positive pressure impression, certain conditions must be met: firstly, a solid, non-perforated tray should be used; secondly, only a thermoplastic mass should be used to take the impression; thirdly, compression should be continuous and stop only after the mass hardens. Continuity can be ensured by the effort of the doctor's hands (arbitrary pressure) or by the pressure of the muscles lifting the lower jaw (chewing pressure). For this purpose, occlusal rims are attached to baseplate trays (Fig. 47).

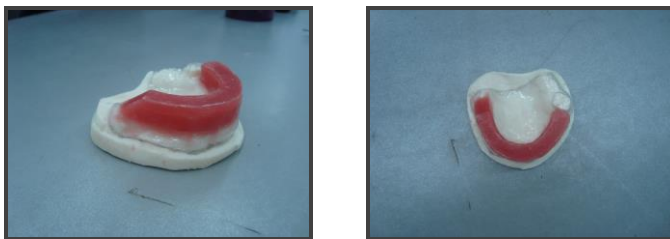


Figure 47. Production of individual baseplate trays with occlusal rims

Decompression functional impressions (Brakhman G.B., 1940; Solomonov M.L., 1960) are obtained without pressure on the tissues of the prosthetic bed. The mucous membrane is processed at rest. According to the principles of decompression impression, the impression material should reflect without distortion every detail of the oral mucosa, so that the relief of the prosthesis base corresponds to the smallest details to the structure of the mucosal surface of the prosthetic field. The impression obtained with the help of a perforated individual baseplate tray with a liquid impression material provides exactly such a reproduction of the relief of the surfaces of the prosthetic field tissues. Fixation of prostheses made by decompression impressions is relatively weak. These impressions are used for certain indications: in significant or complete atrophy of the alveolar processes and the mucous membrane (second class according to Supple), as well as in its increased sensitivity (fourth class according to Supple).

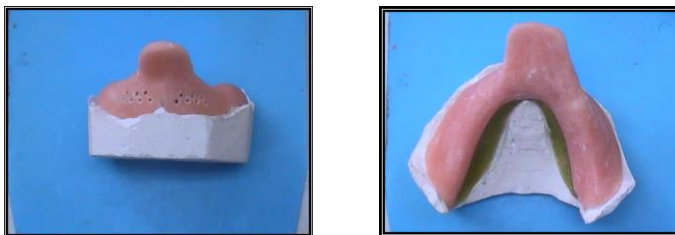
The differentiated impression provides a selective load on individual sections of the prosthetic field, depending on their functional endurance. After removing the primary impression with a standard baseplate tray, the places of future decompression are outlined on the plaster model, these places are covered with a thin foil or filled with a thin layer of wax (Fig. 48).



*Figure 48. Differentiated functional impressions.
Preliminary preparation of plaster models [29]*

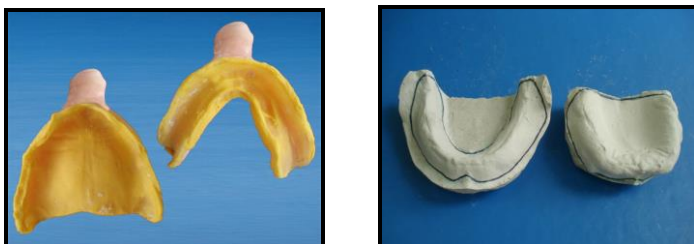
Obtaining a differentiated impression is carried out in two stages. A dense impression material is applied to a pre-fitted baseplate tray and an impression is obtained from the entire prosthetic bed under pressure. Then the impression is removed from the oral cavity, evaluated, and the impression material is removed with a sharp scalpel in the places to be unloaded. In an individual baseplate tray perforations are made in the same places with a cutter, which are necessary to remove excess impression material in the decompression areas. Then a liquid-flowing material is applied to the existing positive pressure impression, to the places of unloading, an baseplate tray is inserted into the oral cavity and the impression is taken under the same pressure.

The method of obtaining a differentiated impression is indicated for all types of mucosa (Fig. 49).



*Figure 49. Differentiated functional impressions.
Preparing individual baseplate trays*

Using the obtained differentiated impression, a working plaster model is cast, on which the adjusted boundaries of the basis are applied (Fig. 50).



*Figure 50. Making a working model.
Drawing the boundaries of denture bases*

Lesson 6

DETERMINING THE CENTRIC JAW RELATION OF EDENTULOUS JAWS

The purpose of the lesson – to teach students of the Stomatological Faculty the method of determining the centric ratio of edentulous jaws.

Demonstration by an assistant

1. Determining the height of the upper occlusal rim.
2. Methods of forming the vestibular oval of the upper occlusal rim.
3. Principles of forming the prosthetic plane of the upper occlusal rim.
4. The principles of fitting the lower occlusal rim to the upper one.
5. Methods for determining the height of the lower facial third.
6. Methods for determining the interalveolar height.
7. Determining the centric jaw relation of edentulous jaws.
8. Application of clinical guidelines for choosing the shapes and sizes.
9. Choosing the color of artificial teeth.

Demonstration by a dental technician-laboratory assistant

1. Techniques for plastering working models in an occludator.
2. Techniques of plastering working models into a medium-anatomical articulator.
3. Techniques for setting an artificial dentition on glass.
4. Techniques for setting an artificial dentition by individual occlusal surfaces.

Control questions for checking the initial level of knowledge

1. Definition of the concept "Articulation".
2. Definition of the concept "Occlusion".
3. Definition of the concept "Bite". Classification.
4. Characteristic signs of centric occlusion in various types of bite.
5. The principles of determining the centric ratio of the jaws in various types of dentition defects.

Control questions on the theme of the lesson

1. Sequence of determining the centric jaw relation of edentulous jaws.
2. Anatomical method for determining the height of the lower part of the face.
3. An anthropometric method for determining the height of the lower part of the face.
4. Anatomical-physiological method for determining the height of the lower part of the face.
5. Methods for determining the state of relative physiological rest of the lower edentulous jaw.
6. Requirements for occlusal rims used to determine the centric ratio of edentulous jaws.
7. Rules for choosing artificial teeth.

Determining the centric ratio of edentulous jaws is one of the main clinical stages at which the dentist creates conditions for the correct construction of dentitions and complete dentures in general. It includes the following stages:

- forming the vestibular oval of the upper occlusal rim.
- determining the height of the upper occlusal rim in the frontal region;
- determining the occlusal plane;
- determining the interalveolar height;
- determining and fixation of the centric edentulous jaws relation;
- applying anatomical landmarks on the vestibular surface of occlusal rims.

First, it is necessary to check the quality of the prepared wax bases with occlusal rims, which are subject to the following requirements:

- the bases should fit tight to the models with rounded edges throughout their entire length;
- the height of the occlusal rims should be 2 cm;
- the width of the occlusal rims should be 8-10 mm;
- the upper occlusal rim should be cut at the level of the second molars at an angle of 45°;
- wax bases should be able to be sucked, without signs of balancing.

Forming the vestibular oval of the upper occlusal rim. A wax base with occlusal rims is inserted into the oral cavity and the position of the upper lip is determined – it should not be tense or retracted, vertical wrinkles around the mouth should be smoothed out, nasolabial folds should be straightened. Correction of the rim is performed by cutting or layering wax on the vestibular surface (Fig. 51).



Figure 51. Forming the vestibular oval of the upper occlusal rim

Determining the height of the upper occlusal rim in the frontal region. The edge of the rim should be at the level of the lower edge of the upper lip with the mouth closed and protrude 1.5 mm when the mouth is open. It should be noted that the height of the upper occlusal rim is determined individually: it can be located, at the request of the patient, at the level of the lower edge or be significantly lower (Fig. 52).

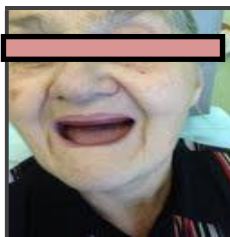


Figure 52. Determining the height of the upper occlusal rim

Formation of the occlusal plane. To do this, a plane parallel to the pupil line is created on the rim in the frontal part. In the lateral part, the formed plane should be parallel to the naso-auricular line. In the practice of orthopedic dentistry, Larin's device or its modifications are used for the visual formation of the prosthetic plane (Fig. 53).

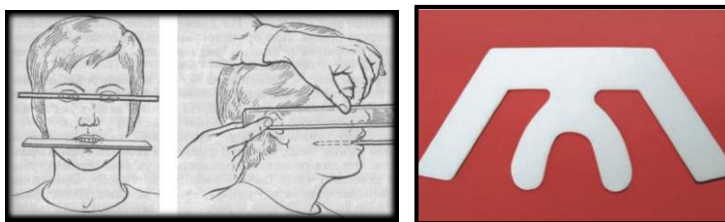


Figure 53. Forming the occlusal plane of the upper occlusal rim [30, 31]

Fitting the lower occlusal rim to the upper one. Occlusal rims should simultaneously and tightly touch each other without gaps in both sagittal and transversal directions. The buccal surfaces of the occlusal rims should be in the same plane. Possible corrections are carried out only on the lower occlusal rim, since the prosthetic plane of the upper rim is already formed and prepared for the teeth placement.

Determining the interalveolar height

1. The anatomical method determining the height of the lower part of the face is based on restoring the correct configuration of the face in the patient. Geezy and Kehler recommend using the following anatomical features which provide an aesthetic optimum of the face to determine the vertical dimension of occlusion: the lips do not retract, they touch each other calmly, without tension along the entire length; the nasolabial folds are clearly pronounced, the corners of the mouth are raised; the orbicular muscle of the mouth functions freely.

The anatomical method is very subjective, that is why clinical practice currently uses anthropometric and anatomical-physiological methods for determining the height of the lower facial part.

2. The anthropometric method for determining the height of the lower part of the face is based on data on the proportionality of individual parts of the face.

The Jupitz method is based on the golden section principle. Finding such points is associated with complex mathematical calculations. The solution of the problem is greatly facilitated if we use the Goeringer compass, which determines the point of the golden section. It consists of two parts: one is a large compass, the other is a small one.

Jupitz suggested that if you install a large compass with its one leg on the mental tubercle, and the other on the tip of the nose, when

the mouth is open as possible, then the middle leg should be on the lower edge of the upper teeth (the lower edge of the upper occlusal rim). After fixing the position of the three legs and asking the patient to close his mouth, we install the Goeringer compass with its middle leg on the tip of the nose, the lower leg should be installed on the mental tubercle (Fig. 54).

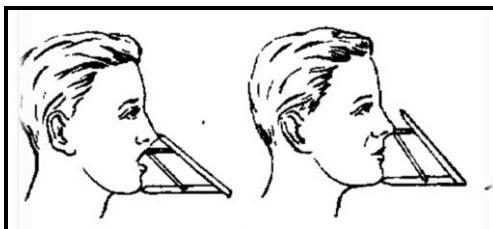


Figure 54. The anthropometric method for determining the height of the lower face [32]

The Wadsworth-White method, based on the equality of distances from the middle of the pupils, to the line of closing the lips and from the base of the nasal septum to the lower part of the chin. (Fig. 55).



Figure 55. An anthropometric method for determining the height of the lower part of the face

The Kantorovich method is based on dividing the face into three equal parts: from the hairline to the middle of the brow line, from the middle of the brow line to the tip of the nose, from the tip of the nose to the lower part of the chin.

3. Anatomical-physiological method for determining the height of the lower part of the face. The patient is involved in a short

conversation on abstract topics. At the end of the conversation, the lower jaw is set in a resting position. A calm, unstrained state of the maxillofacial musculature is called a freeway space. It is characterized by the presence of a gap between the teeth within 2-3 mm. In this position, the doctor measures the distance between two points: at the base of the nasal septum and on the protruding part of the chin. This distance is important and is fixed by a mark on the ruler. Then the upper and lower occlusal rims are inserted into the oral cavity and when the rims are closed efforts are made to make the distance between the two points (at the base of the nasal septum and on the protruding part of the chin) less by 2-3 mm than the distance measures.

Correctness of determining the interalveolar height can be checked by a conversational test. The patient is asked to pronounce several sounds (o, i, z, p, f) and monitor the degree of occlusal rims separation. If the interalveolar height is a properly defined, this separation should be 5-6 mm (Fig. 56).

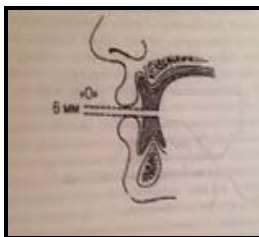


Figure 56. Anatomical-physiological method for determining the height of the lower face [33]

Fixation of occlusal rims to each other. To place the lower jaw in the position of the centric occlusion, the patient's head is slightly tilted back. After that, the patient is asked to touch the back of the hard palate with the tip of the tongue and simultaneously make a swallowing movement. This technique ensures placing the lower jaw in the position of the centric occlusion. On the occlusal surface of the upper rim, in the area of the premolars of the molars, non-parallel wedge-shaped incisions are made. The heated wax is placed symmetrically on the lower occlusal rim. Templates are inserted into the oral cavity and the patient is asked to close his jaws according to the method described above.

Drawing orientation lines for placing the six front teeth. The middle line is an imaginary line running between the central incisors. It is applied as follows: from the hairy part of the head it falls strictly down by the middle of the face. The canine line is the line that runs along the axis of the canines and corresponds to the wings of the nose. The line of the front teeth necks or the smile line is drawn along the border with the vermillion border of the upper and lower lips when smiling (Fig. 57).

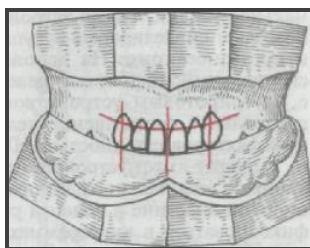


Figure 57. Determining the centric jaw relation of edentulous jaws. Marking clinical guidelines [34]

The connected templates are removed from the oral cavity, applied to plaster models and sent to a dental laboratory for teeth set-up.

Choosing artificial teeth. The aesthetic criterion on which artificial teeth set-up in complete dentures is based has entered the literature under the name "Nelson's triad", according to which the shape of teeth and dental arches should correspond to the shape of the face. As a result of numerous measurements on the skulls of people belonging to different races, three types of faces were determined: triangular, square and rounded. Based on this, modern industry produces three types of teeth (Fig. 58).

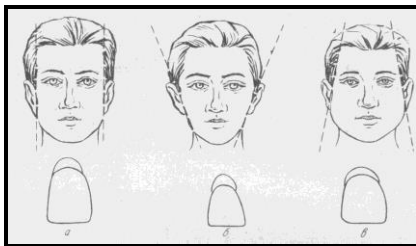


Figure 58. Types of face and shape of teeth [35]

Lesson 7

RULES AND METHODS

OF DESIGNING ARTIFICIAL DENTITIONS

The purpose of the lesson – to teach students of the Stomatological Faculty the basic provisions of articulation laws and the possibility of their use in designing complete dentures.

Demonstration by an assistant

Recordings of mandibular movements (video demonstration).

Control questions for checking the initial level of knowledge

1. Biomechanics of the dento-facial system. Vertical movements of the lower jaw.
2. Biomechanics of the dento-facial system. Sagittal movements of the lower jaw.
3. Biomechanics of the dento-facial system. Transversal movements of the lower jaw.
4. Devices that reproduce the movements of the mandible.

Control questions on the theme of the lesson

1. Rules for setting teeth on glass in a hinged occludator.
2. Anatomical artificial teeth set-up in a medium anatomical articulator.
3. Rules for setting teeth by spherical surfaces.
4. Rules for setting teeth according to individual occlusal surfaces.
5. Devices that reproduce the movements of the mandible.

The clinical stage – determining the centric ratio of edentulous jaws, is followed by the laboratory stage – construction of artificial dentitions. Currently, artificial teeth set-up is carried out in the following ways:

- in a hinged articulator or occludator on glass;
- in a hinged articulator or occludator by spherical surfaces;
- in a hinged occludator by individual occlusal surfaces;
- in the medium anatomical articulator after intra-oral recording of the mandibular movements.

Teeth set-up in a hinged occludator. After the models are plastered into the occludator, a glass plate is glued to the occlusal surface of the upper rim. A layer of wax equal to the thickness of the glass is cut off from the occlusal surface of the lower rim and the glass is glued onto the lower occlusal rim. The upper teeth are located in relation to the glass surface as follows:

- the central incisors touch the surface of the glass;
- the lateral incisors are slightly inclined to the center and lag behind the glass surface by 0.5 mm;
- the canines touch the glass with their cutting cusps;
- the first premolars touch the glass with the buccal cusp, the palatal cusps lag behind the glass by 1.0 mm;
- the second premolars touch the plane of the glass with both cusps;
- the first molars touch the glass with an anterior palatine cusp, the rest are separated from the glass at different distances: mesio-buccal – by 0.5 mm, posterior-buccal – by 1.5 mm, retropalatal – by 1.0 mm;
- the second molars – do not touch the surface of the glass, the posterior cusps lag behind it by 2–2.5 mm.

Having finished setting the teeth on the upper jaw, the glass is removed from the lower wax rim and the teeth are set on the lower jaw. Teeth set-up on the lower jaw begins with setting the second premolars, then the first and second molars and the first premolars are set. After finishing setting the lateral group of teeth, the front teeth are installed: incisors and canines.

Teeth set-up in a progenic ratio of edentulous jaws. In a moderate progenic relation, the front teeth are placed in a direct closure or according to the rules of orthognathic bite, expanding the upper dental arch and narrowing the lower one, and the masticatory teeth are placed in such a way that the *lower* ones overlap the *upper* ones. To do this, the lower right masticatory teeth are placed on the upper jaw on the left, and the lower left masticatory teeth are placed on the upper jaw on the right. The teeth of the upper jaw are placed with a similar cross on the lower jaw. In a pronounced progenia, the frontal teeth are set in a progenic relation preserving the contact in the frontal part. The upper dentition is shortened by two upper premolars.

Teeth set-up in a prognathic edentulous jaws relation has some features – the length of the lower dentition is shortened by two premolars. Other than that, the teeth are set according to the usual rules.

Teeth set-up in a direct relation of edentulous jaws. When designing teeth according to an orthognathic bite, it is necessary to slightly expand the upper dentition and slightly polish the labial surface of the lower frontal teeth to create a minimum overlap by the upper frontal teeth.

Rules for setting teeth by spherical surfaces. The spherical theory of articulation is based on the sagittal curvature of the dentition. As a result of conducted clinical studies, it was found that surface contact between the occlusal rims in various grinding movements of the lower jaw is possible if the occlusal surfaces of the rims are given a spherical shape, and for each patient there are a number of spherical surfaces ranges that provide contacts between the rims. A spherical surface with a radius of 9 cm is defined as the average.

To design occlusal surfaces on wax rims and to determine the correct prosthetic spherical surface, a special device is proposed consisting of an extraoral facial arch-ruler and intraoral removable forming plates, the frontal part of which is flat, and the distal sections have a spherical surface of various radii. The presence of a platform in the frontal section of the forming plate makes it possible to form the rims in accordance with the direction of the prosthetic plane. The use of occlusal templates with spherical occlusal surfaces makes it possible to check the contacts between the rims at the stage of determining the neutral ratio of the jaws and to use verified curves to construct artificial dentitions that do not require correction.

Methods of setting. A spherical staging plate is glued to the spherical occlusal surface of the upper bite rim. The lower bite rim is cut to the thickness of the plate and a staging plate is also installed on it. The placement of the upper artificial teeth is carried out in such a way that they touch the plate with all their tubercles and cutting edges (with the exception of 2/2). Teeth must be placed strictly along the ridge of the alveolar process and taking into account the direction of the alveolar lines. The placement of the lower artificial teeth is performed by the upper ones.

Rules for setting teeth by individual occlusal surfaces. Efron's method. After determining the centric ratio of the jaws and plastering the models in the occludator, teeth are placed on both jaws, and wax occlusal rims are left in the area of the chewing teeth. Occlusal templates are introduced into the oral cavity and the patient is asked to match the teeth in the *anterior occlusion*. A wax inlay is placed in the resulting wedge-shaped gap on both sides. The templates are removed from the mouth, cooled in water and re-introduced into the oral cavity, inviting the patient to close his teeth in the *centric occlusion*. At this, a wedge-shaped lumen is formed between the front teeth to eliminate which wax in the form of a wedge must be cut off from the upper rim (in the area of chewing teeth). After that, the surface of the upper rim acquires a convex shape, i.e. a sagittal occlusal curve is created, along which the chewing upper and then lower teeth are placed.

Devices that reproduce the movements of the mandible. In manufacturing functionally complete dentures, an important place is given to correct placement of artificial teeth – creation of multiple contacts between them during any movements of the lower jaw.

The construction of dentitions in prostheses is carried out in special devices that reproduce to some extent the movements of the lower jaw. Devices that can only reproduce vertical movements of the mandible (opening and closing) are called occludators.

Devices that enable to reproduce all kinds of mandibular movements are called articulators. Articulators are divided into two groups: simplified (medium) with an average tilting adjustment of the articular and incisor paths, and universal ones with an individual tilting adjustment of articular and incisor paths. They can be articular and anarthrous.

Occludators consist of two wire or cast frames connected to each other pivotally. The lower frame is bent at an angle of 100-110° and simulates the mandibular angle and ramus.

In the rear part of the frame there is a platform for the stop of the pin holding the interalveolar height. The upper frame is located in the horizontal plane and has a vertical pin resting on the platform on the lower frame.

Simplified articulators. Their design is based on the arithmetic mean values of the angles of mandibular movements.

In a simplified articulator, the angle of the sagittal articular pathway is 33° , the lateral articular pathway is $15-17^{\circ}$, the sagittal incisor pathway is 40° and the lateral incisor pathway is 120° . The average anatomical Geesey's articulator consists of the following parts:

- the lower and the upper plates,
- the anterior vertical pin,
- couplings with a screw holding the arrow (center pointer),
- horizontal rod,
- incisal platform,
- two rods for fastening the upper coupling and the incisal platform with the articulator plates.
- springs.

Lesson 8

PRINCIPLES OF FITTING AND APPLYING DENTURES IN COMPLETELY ABSENT DENTITION

The purpose of the lesson:

- to teach students to properly check the wax structures of prostheses, to recognize errors, their causes and the ways to eliminate them;
- to introduce students to with the rules of fitting and correcting complete removable dentures in the oral cavity;
- to master the rules of applying and adapting prostheses;
- to master the rules for giving instructions to patients about the rules for using complete removable dentures;
- to introduce to the principles of medical examination of patients.

Demonstration by an assistant

1. The most common errors:
 - incorrect determined height of the lower face;
 - fixation of the lower jaw with displacement in the horizontal plane;
 - errors caused by the loose fit of the bite rims to the prosthetic bed;
 - crushing of the base or its displacement when fixing the centric ratio of the jaws.
2. Dentures superimposition in the mouth of a patient with complete adentia.
3. Checking the prostheses outside the oral cavity.
4. Correcting the area of the frena, the cords of the mucous membrane.
5. Checking the fixation of the prostheses.
6. Closing of the dentition in the centric, anterior and lateral occlusions.
7. Correcting occlusal contacts using carbon paper.

Control questions on the theme of the lesson

1. Rules for checking the wax construction of a complete removable prosthesis in a dental laboratory.
2. Rules for checking the wax construction of a complete removable prosthesis in the clinical practice.

3. Errors in determining the interalveolar height. Signs. Methods to eliminate them.

4. Errors in determining the centric ratio of edentulous jaws. Signs. Methods to eliminate them.

5. Rules for aesthetic teeth setting.

6. Rules for plastering a plaster model with a wax construction of a complete denture in a flask by a reverse method.

7. Rules for superimposing a complete removable prosthesis in the oral cavity.

8. Rules for using a complete removable prosthesis.

9. Rules for adapting to complete removable prostheses.

Checking the wax prosthetic construction in the dental laboratory. After setting the teeth according to one of the methods listed above, the dental technician carries out positioning the wax prosthetic construction. The edges of the wax base should be located along the marked boundaries, have the thickness corresponding to the edge of the functional impression, be smooth and rounded. The thickness of the wax base should be uniform; its surface should be smooth. The teeth are thoroughly cleaned of wax; a small rounded protrusion should be modeled in the neck area.

Checking the wax prosthetic construction in the clinical practice. Checking the prosthetic construction consists of the following stages:

- checking the teeth positioning in an occludator or articulator;
- inspection of jaw models;
- checking a wax template with teeth in the oral cavity;

When checking the placement of teeth in an articulator or occludator, attention should be paid to the color, size and shape of the teeth, the size of the incisal overlap - no more than 1-2 mm, the pronouncement of cusps on the chewing teeth is not welcome. The position of the teeth in relation to the alveolar ridge is evaluated as well. The following rules must be observed: the lateral teeth of the upper and lower jaw and the front lower teeth should be located strictly in the middle of the alveolar ridge, 2/3 of the crown of the upper front teeth should be located outside of the midline of the alveolar ridge, 1/3 inside of it.

Next, it is necessary to evaluate all occlusal contacts of lateral teeth, both from the vestibular and palatine sides. If the teeth are

placed in the articulator, then the occlusal contacts are checked in the anterior and lateral occlusions.

After that, the working models of the jaws are examined. Plaster models should have no cracks, diffused contours of the prosthetic bed or defects on the surface.

The wax structure of a complete denture is wiped with alcohol, introduced into the oral cavity and the correctness of determining the interalveolar height is checked by the anatomical and physiological method using a conversational test. In the increase of the interalveolar height, the dentist should be guided by the location of the upper teeth. If they are correctly positioned relative to the upper lip, the interalveolar height is reduced at the expense of the lower teeth. They are extracted, a lower occlusal rim is made and the centric ratio of the edentulous jaws and the interalveolar height are re-determined. If an increase in the interalveolar height occurred because the height of the upper occlusal rim was incorrectly determined, then teeth are extracted from both jaws, occlusal rims are made for both jaws and the centric ratio of edentulous jaws and the interalveolar height is re-defined.

If the interalveolar height is lowered, if the upper dentition is set correctly, then a strip of softened wax is applied to the lower dentition and the patient is asked to close his teeth until the desired height is established. The upper model is separated from the articulator, put it in a new position and plastered again (Fig. 59).

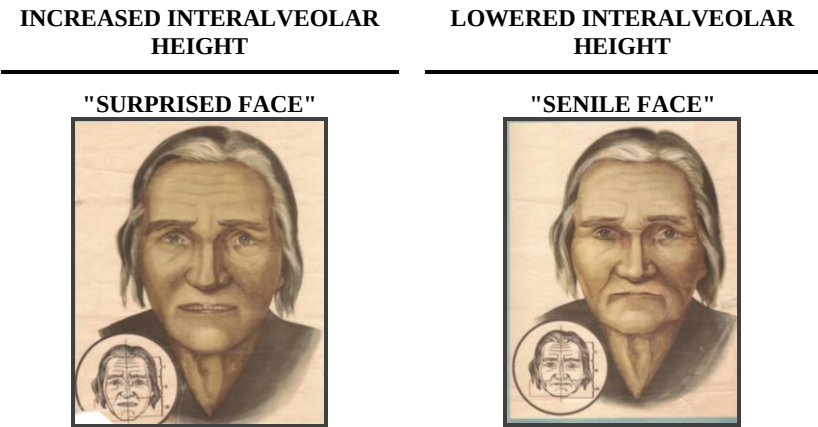


Figure 59. Clinical and laboratory stages of complete dentures' manufacturing. Mistakes

When checking the centric ratio of edentulous jaws, errors are also detected. The most common is mandibular advancement. In this case, when checking the design in the oral cavity, a prognathic ratio of the dentitions, a cusp-to-cusp occlusion of the lateral teeth, an increase in the interalveolar height and a gap between the front teeth will be noted.

After checking the correctness of determining the height of the lower face and the centric occlusion, the contact density of artificial teeth is checked. If there are no contacts between individual opposing teeth, then they are restored. It is also possible that there is a gap between all the lateral teeth or between the lateral teeth on only one side. This is easily detected when trying to insert a spatula between the teeth. The gap between the lateral teeth on one or two sides develops due to the overturning of the wax base on one side or its hanging on the upper jaw from behind. In order to fix that, a softened wax plate is taken, placed on the teeth from the side where the gap is found, and the patient is asked to close his teeth. According to the wax impression, the upper plaster model, previously separated from the occludator, is connected to the lower one, and it is again plastered into the occludator (Fig. 60).

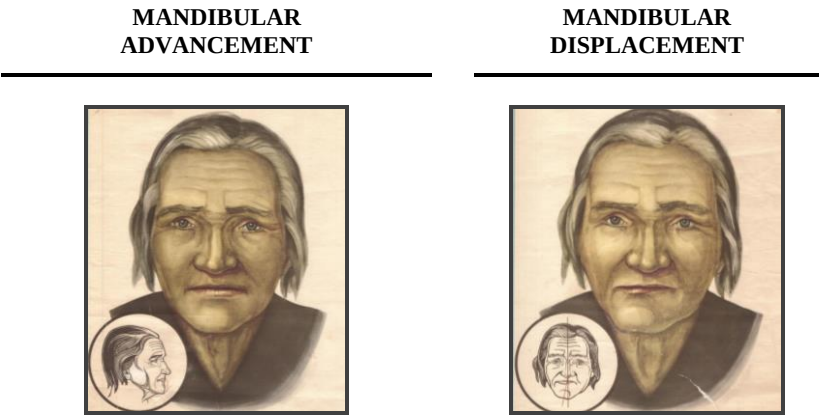


Figure 60. Clinical and laboratory stages of complete dentures' manufacturing. Mistakes

When checking the prosthetic construction, the dentist should not forget about aesthetics. It is necessary to carefully check the standing of the cutting edges of the anterior teeth from under the upper lip when talking, smiling, as well as the position of canines in relation to the corners of the mouth, the lines between the central incisors of the upper and lower tooth rows should be in the same plane, coinciding with the middle line of the face. Its shifting in one direction or another makes the smile ugly. Correspondence of the size, style of teeth to the type of face are checked. With advancing age, the teeth become darker, so older people should have dentures with darker teeth. Milky-white teeth in an elderly person immediately raise doubts about their nature.

Checking the prosthetic construction ends with clarifying the boundaries of the prosthetic bed on the model. The palatine torus, the bony protrusions of the alveolar process should be covered with an insulating foil to exclude their contact with the basis of the prosthesis.

After the final modeling of the wax denture reproduction is completed, the plaster models are beaten off from the occludator frame and cast into the flask in a reverse way. The model is immersed in water for a few minutes. The plaster is mixed and the upper part of the flask is filled with it, into which the model is immersed so that the teeth and artificial gums rise above the side of the flask. Only the plaster model is cast, and the gums, teeth, and the palatine surface of the base remain free of plaster. Plaster is smoothed at the level of the flask sides and placed in cold water for a few minutes. The lower part of the flask is imposed on the upper one, after removing the bottom from the flask base. Plaster is mixed and the flask is filled to the top. The flask is closed with the bottom and put under a press to eliminate excess plaster.

The flask is immersed in boiling water for 5-10 minutes for wax to melt. After that, the flask is removed from boiling water, separated into two halves, the remnants of the base wax are washed off with boiling water and dried. To prevent resin and plaster linking together, the models are covered with a layer of insulating varnish.

Plastics paste is prepared in a porcelain dish by pouring a certain amount of powder (polymer) into it and moistening it with

liquid (monomer). After mixing the powder and liquid, the glass is covered with a lid and the plastics is kept until it becomes fully mature. With clean hands, the necessary amount of plastic is taken, the plastic is in the dough-like stage of maturation, giving the appropriate shape, place it in a flask, connect the halves of the flask and press until the excess plastics comes out. Then the cuvette is strengthened in a metal frame-flask clasp and lowered into water for subsequent polymerization.

When the polymerization process is over, the prosthesis is mechanically processed: finishing, grinding and polishing.

Superimposing a complete removable prosthesis in the oral cavity. After receiving the prosthesis from the dental laboratory, it should be carefully examined. There should be no protrusions, roughness and color streaks on the surface of the prosthesis. Stability of the prostheses is checked by alternately pressing the fingers on the front and lateral teeth. The holding force in the soft palate area is checked by deflecting the cutting edges of the prosthetic teeth on the upper jaw in the vestibular direction; on the lower jaw, the degree of the basis fixation in the distal parts is determined by the same method, alternately from the right and left sides.

In addition to the movements performed by the doctor, the patient performs movements with the tongue and facial muscles, in order to identify possible displacement of complete removable dentures.

Checking the uniformity of dentition closure, which is important for the uniform distribution of masticatory pressure, is performed first in the position of the central occlusion, then in the lateral and anterior occlusions.

After superimposing a complete removable prosthesis, the next appointment of the patient is scheduled in the next three days, then once a week and later – if medically required. The dentist continues to follow-up until he is convinced of achieving adaptation to the prosthesis. This is what E.I. Gavrilov (1978) calls the principle of treatment completeness.

The results of orthopedic dental rehabilitation of patients with completely absent dentition can be called positive or negative, depending on the following factors:

- patients' subjective evaluation of the dentures;
- degrees of prostheses' fixation and stabilization;
- compliance with aesthetic standards;
- clear speech;
- ability to eat various food.

Anyone who receives a complete removable prosthesis is recommended to drink hot tea or coffee with sugar immediately after superimposing a full removable prosthesis. This causes loosening of the oral mucosa and allows the edges of the prosthesis to sink deeper into it. The mucous membrane tightly covers the edges of the prosthesis, adheres to them, contributing to a more stable fixation.

During the first day, the food should be soft, preferably mashed. After eating, the prostheses should be removed and rinsed, and the mouth should be rinsed, too.

To restore diction, it is recommended to talk more and read aloud.

Lesson 9

FULL REMOVABLE PROSTHESES WITH A BILAMINAR BASE

The purpose of the lesson – to study the features of using complete removable prostheses with a two-layer basis.

Demonstration by an assistant

1. Models of edentulous jaws of patients who are indicated to be made two-layer bases.
2. Analyzes the indications, noting that in addition to the unfavorable anatomical features of the prosthetic bed tissues, pain sensitivity of the mucous membrane, chronic diseases of the mucous membrane are also important.

Demonstration by a dental technician-laboratory assistant

Features of plastering models of edentulous jaws with wax structures of complete removable prostheses for further simultaneous polymerization of basic acrylic and soft lining resins.

Control questions for checking the initial level of knowledge

1. Anatomical and topographic features of the structure of edentulous jaws.
2. Exostoses. Definition. Topography.
3. Classification of the mucous membrane according to Supple's classification.
4. The degree of compressibility of the mucous membrane.
5. Elastic plastics. Composition. Properties. Indications for their use.

Control questions on the theme of the lesson

1. Indications for the use elastic plastic in combined denture bases.
2. The technique of applying an elastic lining made of plastic "OrthoSil".
3. The method of applying an elastic lining made of plastic "Orthosil-M".
4. The technique of applying an elastic lining made of "OrthoSil" plastic.

Clinical and laboratory methods of manufacturing a complete removable prosthesis with a two-layer basis by the method of simultaneous polymerization of basic acrylic and soft lining resins.

Under unfavorable anatomical and topographic conditions, prosthetics of edentulous jaws in some cases may be ineffective.

V.Yu. Kurlandsky (1955; 1958), N.V. Kalinina (1957; 1958), G.I. Sidorenko (1958) and others note that it is not always possible to make full-fledged prostheses from hard plastics, and therefore it is not possible to solve all the clinical tasks facing a dentist. Special difficulties are associated with creating a functional full-fledged prosthesis on an edentulous lower jaw in a sharp and uneven atrophy of the alveolar process. The narrow thin ridge of the alveolar process, and sharp bone protrusions (exostoses and sharp maxillofacial lines) complicate prosthetics. In the upper jaw, in a significant uneven atrophy of the alveolar process covered with an atrophied mucous membrane, in acute bone protrusions, in the presence of a "mobile" ridge, a pronounced torus, the functional effect of prosthetics is also small. It is quite difficult to evenly distribute the masticatory pressure on the tissues of the oral cavity through the basis of the prosthesis under such conditions.

Under unfavorable conditions of the prosthetic bed, the basis of the denture should be differentiated, that is, as was noted by V. Yu. Kurlandsky (1958), "where it is firm on the jaw, it should be soft in the base and vice versa". *A two-layer basis can meet such requirements.* Insufficient compressibility of the mucous membrane of the prosthetic bed is compensated by the elastic layer of the prosthesis base.

Introduction of a soft lining between the rigid base and the mucous membrane of the prosthetic bed can favorably affect the effectiveness of prosthetics, since in these cases the masticatory pressure is damped by a soft lining. Thus, *two-layer bases are made in the following cases:*

- 1) in a sharp uneven atrophy of the alveolar processes with a dry, unresponsive mucous membrane, when it is impossible to achieve good fixation of dentures and reduce pain by any well-known methods;

2) in the presence of acute bone protrusions and exostoses on the prosthetic bed, a sharp maxillofacial line and contraindications to surgical preparation, as a result of which the hard base of the denture causes severe painful sensations;

3) in the manufacture of complex maxillofacial dentures;

4) in the manufacture of immediate prostheses with extraction of a large number of teeth;

5) in chronic diseases of the oral mucosa;

6) in allergic conditions due to the use of prostheses made of acrylates;

7) in increased pain sensitivity;

8) in rebasing;

9) for the period of adaptation.

The medical industry produces elastic materials "OrthoSil", "PM-01", "Molloplast-B", "Simpa", "Ufi-gel", etc. The elastic layer can be applied both over the entire prosthetic basis, and in certain areas.

The technique of applying an elastic lining made of "OrthoSil" resin. To manufacture a two-layer basis of the prosthesis, an anatomical impression is obtained, a model is cast, according to which a rigid custom tray is made. After fitting it on the jaw, a functional differentiated impression is taken, taking into account the state of compressibility in the soft tissues of the prosthetic bed. Then, on the working model obtained from a differentiated impression, foil linings of an appropriate thickness are fixed to form a rigid basis of insulating sections on the inner surface (according to the type of torus insulation). After the production of rigid bases made of acrylic resin, the neutral ratio of the jaws is determined. Then, having installed the models in the occludator, the teeth are set on a rigid basis. Inspection of the prosthetic construction, replacement of wax with resin, resin polymerization and finishing of prostheses are carried out according to generally accepted methods. The production of the two-layer prosthetic basis is completed by forming and more precise defining the basis' boundaries on the jaw with the help of OrthoCor impression mass, which is subsequently replaced with OrthoSil elastic plastic. OrthoCor plays a crucial role in creating an effective functional suction and will make it possible to form the relief of the base and

refine its boundaries under the force of masticatory pressure during chewing.

A layer of plastic with a thickness of 1.0-1.5 mm is removed on the prosthesis. Along the entire outer edge of the prosthesis, retreating from it by 2 mm, a shoulder is created. An OrthoCor plate is applied to the prosthetic bed, the edges of which are 2-3 mm longer than the edge of the prosthesis. Then the OrthoCor layer is heated over the flame of the burner or in hot water and the prosthesis is inserted into the oral cavity for 10-15 minutes for the functional design of the prosthetic bed edges under the action of masticatory pressure force.

After such processing, the denture is removed from the oral cavity and the OrthoCor edge is cut off with a spatula at the border of the shoulder (the shoulder is made so that the future edge of OrthoCor is not thin and does not peel off along the edge of the prosthesis). Then the procedure of processing the edges in the mouth can be repeated.

The prosthesis with OrthoCor is cast in a flask in a direct way, to the edges of the impression material. After the plaster has solidified, a female die is made. Then the flask is immersed in hot water for 3-5 minutes, OrthoCor is removed, the female die is treated with a separating varnish "Izokol", and the prosthetic bed is treated with OrthoSil catalyst. Necessary amount of OrthoSil paste is mixed with a catalyst, pack it and put the flask under the press for 1 hour.

The flask is opened in the usual way, and the edges of OrthoSil are processed with sharp cutters and polished with felt wheels.

Technique of applying an elastic lining made of "Soft Liner" material. "Soft Liner" is an elastic material of the acrylic group, which is vulcanized directly in the patient's oral cavity.

"Soft Liner" enables to quickly and easily get an elastic layer of lining to the prosthetic base, without resorting to the help of a dental laboratory. Before applying the material, the surface of the prosthesis is treated with a stone or a cutter to give it necessary roughness and remove the plastic (about 1 mm). The powder is mixed with the attached liquid. The resulting composition is applied with a spatula to the prosthesis and the latter is inserted into the patient's oral cavity. The exposure time in the mouth is 5-6 minutes.

Mechanical processing of the "SoftLiner" lining edges (removal of excess elastic material) should be carried out no earlier than 10-15 minutes after manufacture.

Technique of applying the elastic lining "PM-01". The prosthesis is made according to the usual method up to the stage of replacing wax with resin. After the wax has been removed from the flask, the technician squeezes the model with a plate of heated base wax and cuts the wax along the border of the future prosthesis. Then, in one cup, a usual base resin is mixed, in the other – "PM-01". The dough-like resin is introduced into the half of the flask where there are teeth, and pressed. The flask is opened, the base wax plate is removed from the model, "PM-01" is placed in its place and repressed. The polymerization mode is usual.

Many patients who lost their teeth long ago and do not use orthopedic structures or complete removable dentures for a long time, there is a decrease in the interalveolar height. In some patients, this can be without any complaints; others develop the phenomena of arthropathy, skin maceration (sores) in the corners of the mouth and other symptoms. A change in appearance is common to all patients.

During repeated prosthetics, the interalveolar height should be normalized. An increase in the interalveolar height in accordance with the individual anatomical and physiological characteristics of the patient's masticatory apparatus is considered as a therapeutic and preventive measure that prevents possible complications in masticatory muscles and the temporomandibular joint.

A decrease in the interalveolar height in people using dentures may be associated with:

- 1) errors of the dentist during primary prosthetics;
- 2) imperfection of methods for determining the interalveolar height;
- 3) erasability of plastic and natural teeth;
- 4) immersion of opposing pairs of teeth in the sockets in functional overload of their parodontium and simultaneous abrasion of plastic teeth, as well as in atrophy of the alveolar process of an edentulous jaw.

Therefore, in the treatment plan, it is mandatory to restore the height of the lower third of the face to the individual anatomical and physiological norms of the patient.

An increase in the interalveolar height in accordance with the individual anatomical and physiological characteristics of the masticatory apparatus is considered as a therapeutic (increase in the denture's masticatory effectiveness, restoration of aesthetic norms and speech, treatment of arthropathies) and a preventive measure that prevents various complications in the masticatory muscles and the temporomandibular joint.

There are different opinions on the issue of the staging in restoring the height of the lower third of the face. Some authors consider it expedient to increase the interalveolar height in a single step, explaining this by the fact that complaints of joint pain and muscle fatigue are rarely observed and are easily eliminated by a slight decrease in the interalveolar height.

Most researchers adhere to the principle of multi-stage restoration of the height of the lower part of the face, considering the height of physiological rest as the starting point.

These methods are based on the development of a new state of physiological rest, a new functional level in the masticatory muscles. Reflexes associated with the separation of the bite ("bite separation reflexes"), in the manifestation of which "stretch reflexes" of the masticatory muscles take a large part, are called myostatic, or myotatic. The beginning of the myotatic reflex is given by impulses arising in the receptors located directly in the masticatory muscles and their tendons. These receptors get irritated due to muscular stretching, which, in turn, occurs in prolonged lowering of the lower jaw. The more the lower jaw is lowered, the more the levators of the lower jaw (the chewing muscles themselves – m. masseter, temporalis et pterigoideus medialis) are stretched, in the receptors of which impulses arise that cause their reflex contraction. The static state of the lowered lower jaw, exceeding its initial position at physiological rest, contributes to the restructuring of myotatic reflexes in masticatory muscles. To separate the bite, old prostheses of patients are used by building up and forming their occlusal surface using a laboratory method or self-hardening resin with creating a functional masticatory link in the front teeth area. The functional stress in the area of the lateral teeth is known to be twice as much as in the area of incisors, since the latter are twice as far from the mandibular articulation point. Therefore, when rebuilding the height

of the lower face, it is advisable to create a functional center (teeth contact) in the area of the anterior link (self-hardening resin is layered in the area of the front six teeth).

Indications for repeated prosthetics are a decrease in therapeutic and preventive properties and an increasing undesirable effect of the prosthesis. Clinical observations have shown that after 3 years of using dentures, the masticatory efficiency remains high, but is achieved by lengthening the time of chewing food, i.e. the grinding ability of artificial teeth decreases. In addition, prostheses are remanufactured in cases of their balancing, frequent breakdowns, changes in the tissues of the prosthetic bed.

In repeated prosthetics, due to the changed conditions in the oral cavity, it is necessary to solve fundamentally new tasks. In particular, this refers to a change in the interalveolar height in people who have been using prostheses with a reduced interalveolar height for a long time, a change in the denture's boundaries and, finally, a change in the width of the artificial dental arch.

Expansion of the boundaries of the complete removable lower prosthesis happens due to covering the mucous tubercle with the basis of the prosthesis, overlap of the maxillofacial line, as well as expansion of the basis in the sublingual space.

The next feature of repeated prosthetics is setting teeth, especially in dentures for the upper edentulous jaw. After the loss of the last tooth, the so-called senile progenia takes place. Atrophy of the alveolar process on the upper jaw occurs mainly in the vestibular surface, which also leads to narrowing of the alveolar arch. On the lower jaw, atrophy takes place more on the lingual side, which expands the lower alveolar arch.

In an effort to fulfill the classical rules of setting teeth, the artificial dentition is narrowed, creating obstacles to the free movement of the tongue. To eliminate the resulting disorders, it is necessary to increase the oral cavity due to some expansion of the dental arch in the new prosthesis.

In re-prosthetics of patients, it is necessary to carefully study the shape of the palatine part of the old denture, atrophy of the alveolar process, narrowing of the alveolar arch, the shape of the old denture, its thickness, teeth setting on it.

When performing repeated prosthetics, it is necessary to take into account the characteristics of this patient and the fact that he has previously used prostheses. On the one hand, treatment of such patients is facilitated, since the prejudice against a removable denture disappears. At the same time, the patient is accustomed to old, although functionally defective dentures, and adaptation to new ones, even if functionally and aesthetically more favorable, may be the reason for refusing to use prostheses. These factors should be taken into account by the dentist when carrying out repeated prosthetics. (Scheme 3).

Scheme 3

Stages of repeated prosthetics. A minimum of manipulations

Stages of action	Means of action	Self-control criteria
Processing the denture's surface with a cutter to give it necessary roughness and remove 1 mm of plastic	Dental prosthesis, dental handpiece, cutter	Roughness of the denture's inner surface
Applying the sublayer with a brush for 5-10 minutes	Plastic sublayer	The sublayer should not have a specific smell of a solvent
Mixing the paste and "OrthoSil-M" resin catalyst	Paste and catalyst for resins, glass, spatula	Homogeneous consistency of plastic
Applying plastic to the denture and inserting it into the oral cavity for 2-3 minutes	Denture, plastic	Hardening of the elastic resin layer
Mechanical processing of the lining edges made from "OrthoSil-M" (removal of excess elastic material) in 24 hours after manufacture	A denture with a layer of elastic resin, a handpiece, a cutter	Smooth surface of the denture without excess plastic
Denture's superimposition in the patient's oral cavity	A dental prosthesis	The denture in the oral cavity meets all the requirements

Lesson 10

REACTION OF PROSTHETIC BED TISSUES TO COMPLETE REMOVABLE PROSTHESES

The purpose of the lesson – to study possible reactions of the oral organs and tissues that develop when wearing complete removable dentures in patients with complete secondary adentia.

Demonstration by an assistant

Clinical manifestations that occur in the oral cavity of a patient using a complete removable denture.

Control questions for checking the initial level of knowledge

1. Polymers Properties, Scope of application.
2. The technology of the denture's base resin.
3. Main base resins and their properties.

Control questions on the theme of the lesson

1. Prosthetic stomatitis. Etiology. Pathogenesis. Clinical manifestations. Diagnostics. Treatment.
2. Traumatic stomatitis. Etiology. Pathogenesis. Clinical manifestations. Diagnostics. Treatment.
3. Toxic stomatitis. Etiology. Pathogenesis. Clinical manifestations. Diagnostics. Treatment.
4. The "greenhouse effect". Etiology. Pathogenesis. Clinical manifestations. Diagnostics. Treatment.
5. The suction cup effect. Etiology. Pathogenesis. Clinical manifestations. Diagnostics. Treatment.
6. Allergic stomatitis. Etiology. Pathogenesis. Clinical manifestations. Diagnostics. Treatment.

First of all, it is necessary to find out the nature of the irritants generated by the prosthesis. E.I. Gavrilov distinguishes side toxic, allergic and traumatic effects.

Prosthetic stomatitis. The inflammation caused by removable dentures is called prosthetic stomatitis. Focal inflammation develops against the background of a normal or atrophied mucous membrane. It manifests itself in the form of spot hyperemia, hyperemic spots on

the mucous membrane of the hard palate or the alveolar part of the upper or lower jaw. Against the background of edematous epithelium, erosions, hyperplastic growths, spot hemorrhages are observed. Foci of inflammation can be single or multiple.

Generalized, diffuse inflammation of the mucous membrane of the prosthetic bed is characterized by the same signs and occupies the entire space of the prosthetic bed, exactly coinciding with its boundaries. The prosthetic bed looks cherry-red, swollen, loosened.

The causes of focal inflammation of the mucous membrane of the hard palate, alveolar processes are a violation of articulation, balancing of the prosthesis, roughness and pores in the prosthetic base, poor oral hygiene.

The factor causing the change in the tissues of the prosthetic bed is the atypical transfer of masticatory pressure by the prosthetic base to the tissues of the prosthetic field (Fig. 61).



Figure 61. Prosthetic stomatitis

Traumatic stomatitis. Most often they are found along the border of the prosthetic bed and their cause is an injury by the edge of the base. In a mild degree, catarrhal inflammation develops. In the case of a deep discrepancy between the prosthetic base and the boundaries of the prosthetic bed, ulcers with edematous edges and a bleeding bottom appear.

One of traumatic stomatitis manifestations can be a lesion "**Decubital ulcer**". The disease develops when the mucous membrane of the tongue or cheeks is mechanically injured by the denture's sharp edge. The patient complains of pain in the affected

area. Upon examination, an ulcer is found, it can be of various shapes, depths and sizes, covered with a grayish-white coating. The edges of the ulcer are edematous. The surrounding mucosa is swollen and hyperemic. The cause of the disease is usually obvious. Elimination of the traumatic factor and administering antiseptic rinses give a good therapeutic effect.

If decubital ulcer is not treated, from an acute injury it develops into a chronic one. This appears as the epithelial hyperplasia, the bottom of the ulcer is clean, it bleeds easily at the slightest injury, sometimes it is covered with a fibrinous plaque.

Morphological examination of the biopsy material reveals the phenomena of hyperkeratosis and submerged epithelial growth.

After the injury is eliminated, the ulcer heals, leaving a scar that deforms the transitory fold and makes it difficult to create a marginal closing valve.

Traumatic stomatitis is observed in most patients using complete removable dentures, but it quickly disappears after correcting the boundaries of the prosthesis base.

Prevention of traumatic stomatitis consists in observing the principle of treatment completeness: after applying the prosthesis, the doctor follows-up the patient until he is sure that the tissues of the prosthetic bed are not threatened by injury.

Toxic stomatitis. There are two types: chemical and bacterial. The former ones are most often called acrylic ones, since their cause is an excess of monomer in the basis of an acrylic prosthesis. By its chemical nature, a monomer is methyl ester of methacrylic acid. All esters have an irritating effect on the oral mucosa. An excess of a monomer, the so-called free monomer, in the basis of a complete removable prosthesis made of acrylic resin is associated with a violation of polymerization regime of the plastic paste.

The second type of toxic stomatitis is caused by toxins of bacterial origin. The latter appear in poor oral hygiene and poor care of prostheses. At this, conditions for the growth of microflora are created in the oral cavity. It increases not only quantitatively, but qualitatively as well – the number of fungal forms of microorganisms increases in the oral cavity. Poor quality of prostheses: the presence of pores, poor polishing, repeated repairs contribute to food retention on the surface of the prosthesis and bacterial proliferation (Fig. 62).



Figure 62. Toxic stomatitis

The "greenhouse effect". This phenomenon is a consequence of the side effect produced by a removable plastic prosthesis in the form of thermoregulation violation in the mucous membrane of the prosthetic bed. The mechanism is as follows. Acrylic basic materials have a low thermal conductivity. For this reason, a higher temperature is set under the basis than in the oral cavity, close to the body temperature. A kind of a thermostat develops in which optimal conditions for the microorganisms' vital activity are created. Toxins released during the vital activity of microorganisms are the cause of inflammation.

Clinically, the greenhouse effect is manifested by diffuse or focal hyperemia.

The "greenhouse effect" is associated with the physical properties of the material and is only aggravated by the microbial factor. That is why the fight against it should consist in the selection of basic materials with greater thermal conductivity.

The suction cup effect occurs as a side effect of using an upper complete removable prosthesis. If the marginal closing valve is properly formed, a vacuum space is created under the surface of the upper complete denture base - vacuum that causes expansion of small-diameter blood vessels and, as a result, hyperemia and edema. Clinically, this is manifested by a diffuse inflammation in the mucous membrane of the hard palate.

Allergic stomatitis, which develops when using complete removable dentures made of acrylic resins, belongs to the group of

contact stomatitis, a delayed-action reaction. Substances that cause an allergic contact reaction are not antigens, since they do not have a protein nature. They acquire these properties as a result of a chemical compounding with the body's proteins. Such substances are commonly called haptens. The components of acrylic resins can be called haptens: monomer, hydroquinone, benzoyl peroxide, zinc oxide, dyes.

Allergic inflammation, having the course of contact stomatitis, manifests itself on the mucous membrane of the tongue, lips, cheeks, alveolar parts, hard palate. It is sharply limited by the contact area of the prosthesis base with the tissues of the prosthetic bed. The mucous membrane in the affected area is bright red, shiny. A combined lesion of the mucous membrane of the lips, cheeks, and tongue is possible (Fig. 63).



Figure 63. Allergic stomatitis

In the clinical practice, it is difficult to make a differential diagnosis between toxic, contact stomatitis, inflammation caused by mechanical trauma to the edges of the prosthesis.

CONCLUSION

The training material presented in this training manual is divided into practical classes, which will help students consistently master the basic level of the discipline and successfully apply algorithms for diagnosis, treatment and prevention of patients with completely absent dentition in further clinical practice.

At the beginning of the lesson the teacher controls the students' knowledge which is made of checking the initial level of knowledge in related disciplines or in sections taught at the department earlier and checking the knowledge on the training subject. The questions asked at this stage are reflected in relevant sections of the training manual.

The theoretical part of the practical lesson supposes a discussion between the teacher and the audience. The teacher explains the students the theoretical justification of manual skills, implementation of which is expected in this practical lesson.

The demonstration part of the practical lesson involves the teacher showing thematic patients, placing correct emphases focused on the topic of the practical lesson. The demonstration of laboratory stages by a dental technician is aimed at supplementing clinical knowledge and skills with laboratory ones, getting acquainted with dental equipment and developing skills for its operation.

Advanced independent work of students involves familiarization with the theoretical justification of manual skills necessary in their further work as dentists and their practical development.

Generalization of the lesson is based on the analysis of mistakes made by students in the process of mastering the topic of practical training. Incomprehensible theoretical aspects, clinical and laboratory errors that have arisen and the ways to eliminate them are analyzed. At the end of the lesson, the teacher voices the next topic, places accents that are significant for studying the new material, recommends literature for independent preparation of students for a new practical lesson.

This training manual conforms to the Federal State Educational Standard of Higher Education in the specialty "Dentistry" (order of the Ministry of Education and Science of the Russian Federation № 984 dated 12.08.2020) and is intended for students of dental faculties, clinical residents, postgraduate students of dental faculties and practicing dentists.

APPENDIX

PROTOCOL OF PATIENT MANAGEMENT "COMPLETELY ABSENT DENTITION (COMPLETE SECONDARY ADENTIA)"

The protocol for patients management "Completely absent teeth (complete secondary adentia)" was developed by Moscow State Medical and Dental University (Professor, Dr. Sc. Med. A.Yu. Maliy, junior research associate N.A. Titkina, E.V. Yershova), I.M. Sechenov Moscow Medical Academy under the Ministry of Health and Social Development of the Russian Federation (Professor, Dr. Sc. Med. P.A. Vorobyov, Dr. Sc. Med. M.V. Avksentieva, PhD in Med. D.V. Lukyantseva), dental polyclinic No. 2 of the city of Moscow (A.M. Kocherov, S.G. Chepovskaya).

I. APPLICABLE SCOPE

The protocol of patient management "Completely absent teeth (complete secondary adentia)" is intended to be used in the healthcare system of the Russian Federation.

II. REGULATORY REFERENCES

The present standard references to the following regulatory documents are used:

Resolution of the Government of the Russian Federation № 1387 dated 05.11.97 "On Measures for Stabilizing and Developing Healthcare and Medical Science in the Russian Federation" (Collection of Legislation of the Russian Federation, 1997, № 46, Article 5312).

Resolution of the Government of the Russian Federation № 1194 dated 26.10.1999 "On Approval of the Program of State Guarantees for Providing Citizens of the Russian Federation with Free Medical Care" (Collection of Legislation of the Russian Federation, 1997, № 46, Article 5322).

III. SYMBOLS AND ABBREVIATIONS

In this document the following symbols and abbreviations are used:

ICD-10 – International Statistical Classification of Diseases and Health-Related Problems, World Health Organization, tenth revision.

ICD-S – International classification of dental diseases based on ICD-10.

IV. GENERAL PROVISIONS

The protocol for patients management "Completely absent teeth (complete secondary adentia)" is designed to solve the following tasks:

- establishment of uniform requirements for the procedure of diagnosis and treatment of patients with completely absent teeth (with complete secondary adentia);
- unification of developing basic programs of compulsory medical insurance and optimization of medical care for patients with completely absent teeth (with complete secondary adentia);
- ensuring the optimal scope, availability and quality of medical care provided to the patient in a medical institution and in the territory within the framework of state guarantees of providing citizens with free medical care.

The scope of this protocol includes medical and preventive institutions of the dental profile at all levels, including specialized departments.

V. MAINTAINING THE PROTOCOL

The protocol is maintained by Moscow State Medical and Dental University under the Health Ministry of Russia. The management system provides for the interaction of Moscow State Medical and Dental University with all interested organizations.

VI. GENERAL ISSUES

According to statistics, completely absent teeth (complete secondary adentia) as a result of tooth extraction, loss due to an

accident (injury) or parodontal diseases is quite common in our country. The incidence of completely absent teeth (complete secondary adentia) increases incrementally (fivefold) in each subsequent age group: in the population aged 40-49 years, the incidence of complete secondary adentia is 1 %, at the age of 50-59 years – 5.5 %, and in people over 60 years – 25 % [3, 8]. In the general structure of providing medical care to patients in medical and preventive institutions of the dental profile, 17.96% of patients are diagnosed with "completely absent teeth (complete secondary adentia)" of one or both jaws [6].

Complete absence of teeth (complete secondary adentia) directly affects the quality of patients' life. Completely absent teeth (complete secondary adentia) causes a violation of the vital body function – chewing food – up to the final loss which affects the process of digestion and the intake of necessary nutrients into the body, and is also often the cause of inflammatory diseases of the gastrointestinal tract. No less serious are the consequences of completely absent teeth (complete secondary adentia) for the social status of patients: violations of articulation and diction affect the patient's communication abilities, these violations, together with changes in appearance due to the loss of teeth and developing atrophy of the masticatory muscles, can cause changes in the psycho-emotional state up to mental disorders.

Completely absent teeth (complete secondary adentia) are also one of the reasons for the development of specific complications in the maxillofacial region, such as dysfunction of the temporomandibular joint and the corresponding pain syndrome.

The concepts of "loss of teeth due to an accident, tooth extraction or localized parodontitis" (K08. 1 according to ICD-S-International Classification of Dental Diseases based on ICD-10) and such terms as "complete secondary adentia" and "completely absent teeth" (in contrast to adentia – disorders of development and teeth eruption – K 00.0), in fact, are synonymous and are applied both to each of the jaws and to both jaws.

Complete absence of teeth (complete secondary adentia) is a consequence of a number of dental system diseases – caries and its complications, parodontal diseases, as well as injuries.

Caries is one of the most common diseases in our country. Its prevalence in the adult population aged 35 years and older is 98-99 %.

The indicators of caries complications development are also significant: the percentage of extractions in the age group older than 35-44 years is 5.5, and in the next age group – 17.29 % [11]. In the structure of dental care, patients with pulpitis, which, as a rule, is a consequence of untreated caries, account for 28-30 % [10].

The incidence of periodontal diseases is also high: the prevalence of signs indicating periodontal lesions in the age group of 35-44 years is 86 % [11], other authors state the incidence of pathological signs of periodontal diseases as 98 %.

These diseases in untimely and poor-quality treatment can lead to spontaneous loss of teeth due to pathological processes in the periodontal tissues of an inflammatory and/or dystrophic nature, to loss of teeth due to extracting untreated teeth and their roots in deep caries, pulpitis and periodontitis.

Untimely orthopedic treatment of completely absent teeth (complete secondary adentia), in turn, causes the development of complications in the maxillofacial region and pathology of the temporomandibular joint.

The main sign of complete secondary adentia)is the complete absence of teeth on one or both jaws.

The clinical presentation is characterized by changes in the face configuration (retraction of the lips), pronounced nasolabial and mental folds, downturned mouth, a decrease in the size of the lower third of the face, in some patients – maceration and "jamming" in the corners of the mouth, a violation of the chewing function. Often, completely absent teeth (complete secondary adentia) are accompanied by the usual subluxation or dislocation of the temporomandibular joint. After the loss or extraction of all teeth, a gradual atrophy of the alveolar processes of the jaws occurs, progressing over time.

CLASSIFICATION OF COMPLETELY ABSENT TEETH (COMPLETE SECONDARY ADENTIA)

In clinical practice, a complete absence of teeth (complete secondary adentia) of the upper jaw, a complete absence of teeth (complete secondary adentia) of the lower jaw, a complete absence of teeth (complete secondary adentia) of both jaws are traditionally distinguished.

Several classifications of edentulous jaws were proposed. The most widespread classifications are that of Schroeder for an edentulous maxilla and that of Kehler for an edentulous mandible. In domestic practice, V.Y. Kurlandsky's classification of edentulous jaws is also widely used. These classifications are based primarily on anatomical and topographic characteristics – the degree of the alveolar process atrophy, as well as the attachment level of the masticatory muscles tendons (V.Y. Kurlandsky's classification). I.M. Oxman's classification is also used, who proposed a uniform classification for the upper and lower edentulous jaws, taking into account the degree of the alveolar processes atrophy.

In the complete absence of teeth (complete secondary adentia), it is impossible to distinguish the stages of the disease course.

GENERAL APPROACHES TO THE DIAGNOSIS OF COMPLETE ABSENCE OF TEETH (COMPLETE SECONDARY ADENTIA)

Diagnosis of complete absence of teeth (complete secondary adentia) is made by clinical examination and taking the history. The diagnosis is aimed at eliminating factors that prevent immediate start of dental prosthetic rehabilitation. Such factors can include:

- not extracted roots under the mucous membrane;
- exostoses;
- tumor-like diseases;
- inflammatory processes;
- oral mucosa diseases and lesions.

GENERAL APPROACHES TO THE DIAGNOSIS OF COMPLETE ABSENCE OF TEETH (COMPLETE SECONDARY ADENTIA)

The principles of treating patients with complete secondary adentia imply simultaneous solution of several tasks:

- restoring sufficient functional ability of the dental system;
- preventing the development of pathological processes and complications;
- improving the quality of patients' life;

- eliminating negative psychoemotional consequences associated with the complete absence of teeth.

The manufacture of prostheses is not indicated if the existing prosthesis is still functional or if its function can be restored (for example, repair, rebasing). The manufacture of a prosthesis includes: examination, planning, preparation for prosthetics and all measures to manufacture and fix the prosthesis, including elimination of deficiencies and control. This also includes instructing and training the patient on taking care of the prosthesis and the oral cavity.

An orthopedic dentist should determine the features of dental prosthetic rehabilitation depending on the anatomical, physiological, pathological and hygienic condition of the patient's dento-facial system. When choosing between equally effective types of prostheses, he should be guided by the indicators of cost effectiveness.

In cases where it is impossible to immediately complete treatment, the use of immediate prostheses is indicated, especially to prevent the development of the temporomandibular joint pathology.

It is possible to use only those materials and alloys that are approved for use, clinically tested, the safety of which was proven and confirmed by clinical experience.

The basis of a complete removable denture should be made, as a rule, of synthetic resin. Reinforcement of the prosthetic basis with special metal meshes can be used. To manufacture of a metal basis, a thorough justification is necessary.

If there is a confirmed allergic reaction of the oral cavity tissues to the prosthesis material, tests should be carried out and the material that has shown itself to be portable should be selected.

In an edentulous jaw, taking a functional impression (cast) is indicated, the functional formation of the prosthetic edge is necessary, i.e. to take the impression (cast), it is necessary to make an individual rigid impression (cast) spoon.

Manufacturing a removable prosthesis for an edentulous jaw using a plastic or metal basis includes the following: anatomical, functional impressions of both jaws, determining the centric ratio of the jaws, checking the prosthetic construction, superimposing, trying-in, fitting, installation, remote control and correcting. If necessary, soft underlinings are used for the prosthesis.

ORGANIZATION OF MEDICAL CARE FOR PATIENTS WITH COMPLETE ABSENCE OF TEETH (COMPLETE SECONDARY ADENTIA)

Treatment of patients with complete secondary adentia is carried out in medical and preventive institutions of the dental profile, as well as in departments of orthopedic dentistry. As a rule, treatment is carried out in outpatient conditions.

Providing assistance to patients with complete absence of teeth (complete secondary adentia) is carried out by orthopedic dentists. In the process of providing assistance, middle-grade medical personnel, including dental technicians and dental hygienists, take part.

VII. CHARACTERISTICS OF THE PROTOCOL REQUIREMENTS

7.1. Patient's model

Nosological form: loss of teeth due to an accident, tooth extraction or localized periodontitis

Stage: any

Phase: process stabilization

Complication: no complications.

ICD-S code: K 08.1

7.1.1. Criteria and signs that determine the patient's model

1. Complete absence of teeth on one or both jaws.
2. Healthy oral mucosa (moderately pliable, moderately mobile, pale pink in color, moderately secretes a mucous secret – Class I according to the Supple).
3. Changing the configuration of the face (lips retraction).
4. Pronounced nasolabial and mental folds, downturning mouth.
5. Reduction in the size of the lower third of the face.
6. Absence of exostoses.
7. Absence of pronounced atrophy of the alveolar process (in complete absence of teeth on one or both jaws – class I according to Kurlyandsky, class I according to Oxman, in complete absence of teeth on the upper jaw – type I according to the Schroeder classification, in complete absence of teeth on the lower jaw – type I according to Kehller).

8. Absence of pronounced pathology of the temporomandibular joint.

9. Absence of oral mucosal diseases.

7.1.2. The procedure for including the patient in the protocol

The patient's condition that meets the criteria and signs of diagnosis of this patient model.

7.1.3. Requirements for outpatient-polyclinic diagnostics

Code	Name	Frequency of execution
01.02.003	Palpation of muscles	1
01.04.001	Taking the history and complaints in pathology of joints	1
01.04.002	Visual examination of joints	1
01.04.003	Palpation of joints	1
01.04.004	Percussion of joints	1
01.07.001	Taking the history and complaints in oral pathology	1
01.07.002	Visual examination in oral pathology	1
01.07.003	Palpation of the oral cavity organs	1
01.07.005	Inspection of the maxillofacial region	1
01.07.006	Palpation of the maxillofacial region.	1
01.07.007	Determining the degree of mouth opening and restriction of the mandible's mobility	1
02.04.003	Measurement of joint mobility (goniometry)	1
02.04.004	Auscultation of the joint	1
02.07.001	Oral examination with the help of additional tools	1
02.07.004	Anthropometric studies	1
06.07.001	Panoramic radiography of the maxilla	1
06.07.002	Panoramic radiography of the mandible	1
09.07.001	Examination of impression smears of the oral cavity	As needed
09.07.002	Cytological examination of the oral cyst (abscess) contents or the contents of a dental pocket	As needed
11.07.001	Biopsy of the oral mucosa	As needed

7.1.4. Characteristics of algorithms and features of performing drug-free assistance

Examination is aimed at making the diagnosis that corresponds to the patient's model, excluding possible complications, determining the opportunity to start prosthetic rehabilitation without additional diagnostic and therapeutic and preventive measures.

For this purpose, history is taken, examination and palpation of the oral cavity and the maxillofacial region, as well as other necessary studies are carried out.

History taking

History taking finds out the time and causes of tooth loss, whether the patient used removable dentures earlier, his allergic history. Complaints of pain and discomfort in the area of the temporomandibular joints are purposefully identified. The patient's profession is found out.

Visual examination

During inspection, attention is paid to the pronounced and / or acquired facial asymmetry and the intensity of the nasolabial and mental folds, the nature of lip-seal, the presence of cracks and macerations in the corners of the mouth.

Attention is paid to the degree of opening of the mouth, smoothness and direction of mandible movement, the jaw relation.

Attention is paid to the color, moisture content, integrity of the mucous membranes of the oral cavity in order to exclude concomitant pathology, including infectious diseases.

If there is a suspicion of oral mucosal diseases, impression smears are examined. If the result is positive, the patient is managed according to the appropriate patient model.

Palpation

When examining the oral cavity, attention is paid to the intensity and location of the frenula and buccal folds.

Attention is focused on the presence and degree of the alveolar processes atrophy.

The presence of exostoses hidden under the mucous membrane of teeth roots is revealed. If their presence is suspected, an X-ray examination (a periapical X-ray or dental panoramic radiography) is performed. If the result is positive, immediate prosthetics is postponed and surgical preparation for prosthetics is carried out (in accordance with a different patient model).

Attention is paid to the presence of tumor-like diseases. If they are suspected, a cytological examination, biopsy are performed. If the result is positive, immediate prosthetics is postponed and an appropriate treatment is carried out.

Palpation is performed to determine the torus, the "flabby ridge" and the degree of the mucous membrane compressibility.

Visual examination and palpation of the temporomandibular joints

During the examination, attention is paid to the color of the skin in the joints area. The dentist finds out whether there is a crepitus (clicks) and pain in the area of the temporomandibular joints during mandibular movements. When opening the mouth, attention is paid to synchronicity and symmetry of the articular heads movements.

If a pathology of the temporomandibular joints is suspected, an X-ray examination is performed – a tomography of the joints with the mouth closed and open. If the result is positive, prosthetics should be combined with additional therapy (another patient model – complete secondary adentia with complications).

Anthropometric studies

These studies make it possible to determine the height of the lower part of the face; they are mandatory and are always carried out at the stage of prosthetics.

7.1.5. Requirements for the outpatient treatment

Code	Name	Frequency of execution
16.07.026	Prosthetics with partial removable laminar dentures	According to the algorithm
D01.01.04.03	Correction of a removable orthopedic structure	According to the algorithm
25.07.001	Administration of drug therapy for diseases of the oral cavity and teeth	According to the algorithm
25.07.002	Administration of diet therapy for diseases of the oral cavity and teeth	As needed

7.1.6. Characteristics of algorithms and features of performing drug-free assistance

The main method of treatment for the complete absence of teeth (complete secondary adentia) of one or both jaws is prosthetics with

complete removable laminar dentures. This gives the opportunity to restore the main functions of the maxillary system: biting and chewing food, diction, as well as aesthetic proportions of the face; prevents the progression of atrophy of the jaw bone alveolar processes and atrophy of the maxillofacial muscles (Level A evidence).

In completely absent teeth (complete secondary adentia) on both jaws, complete prostheses for the upper and lower jaws are made simultaneously.

First visit

After diagnostic examinations and making the decision on prosthetics, treatment is started at the same visit.

The first stage is taking an anatomical impression (cast model) to manufacture an individual rigid impression mouth spoon (baseplate).

It is necessary to use special impression spoons (baseplates) for edentulous jaws, alginate impression pastes.

The expediency of using special impression spoons (baseplates) is due to the need to prevent expanded borders, both in the manufacture of individual spoons and in the manufacture of a prosthesis. As an alternative, standard impression spoons (baseplates) are often used in practice, which can lead to stretching of the mucosa along the transitory fold and subsequent expansion of the prosthesis boundaries, which causes poor fixation of the prosthesis. The cost of special and standard spoons is the same.

After removing the impression (cast), its quality is checked (displaying the anatomical relief, absence of pores, etc.).

Next visit

An individual rigid plastic impression spoon (baseplate) is fitted. Attention should be paid to the edges of the spoon made in the laboratory, which should be voluminous (about 1 mm thick). If necessary, the dentist himself can make an individual rigid plastic impression spoon (baseplate) in the clinic.

Fitting is carried out using functional tests according to Herbst. The tests are performed with the mouth half-closed with reduced amplitude of mandibular movements. When deviating from the method of fitting an individual rigid plastic impression spoon (baseplate) using functional tests according to Herbst in a strict sequence, it is impossible to ensure stabilization and fixation of future prostheses.

After fitting, the edges of the spoon are edged with wax and finalized by active (using functional muscle movements) and passive methods.

Along the back edge of the spoon on the upper jaw, an additional strip of softened wax should be placed along line A in order to ensure a full-fledged valvular zone in this area. The distal valve on the spoon on the lower jaw mandible should be closed, creating a sublingual wax rim according to Herbst. This technique ensures closure of the distal valve and prevents a violation of fixation when biting off food.

The criterion for fitting completing is formation of a valvular zone and fixation of an individual spoon on the jaw.

Obtaining a functional impression (cast): removal of the impression (cast) should be made with silicone impression pastes using an appropriate adhesive material (glue for silicone masses). The edges of the impression are formed by active (using functional movements) and passive methods. Zinc-eugenol impression pastes can also be used.

After removing, the quality of the casts (impression) is checked (displaying the anatomical relief, the absence of cavities, etc.).

Next visit

Determining the centric jaw relation using the anatomical-physiological method to find a correct position of the lower jaw in relation to the upper one in three planes (vertical, sagittal and transversal).

Determining the centric jaw relation is carried out using wax bases with occlusal rims made in the dental laboratory. Special attention should be paid to the formation of a correct prosthetic plane, determining the height of the lower facial part, determining the smile line, the median line, the canines' line.

The choice of color, size and shape of artificial teeth is made in accordance with individual characteristics (patient's age, size and shape of the face).

Next visit

Checking the prosthesis design (setting-up teeth on a wax structure carried out in a dental laboratory) on a wax basis to assess the correctness of all previous clinical and laboratory stages of manufacturing the prosthesis and making necessary corrections.

Attention should be paid to: when setting-up teeth according to the type of orthognathic occlusion, the upper front teeth should overlap the lower ones by a maximum of 1-2 mm. When the teeth are closed, there should be a horizontal gap of 0.25-0.50 mm between the upper and lower front teeth.

Next visit

Superimposition and fitting the finished prosthesis after the laboratory stage of replacing the wax base with a plastic one.

Before superimposition, it is necessary to assess the quality of the prosthesis base (absence of cavities, sharp edges, protrusions, roughness, etc.). The color may indicate poor-quality polymerization.

The palatine part of the upper jaw prosthesis should not be thicker than 1 mm.

The prostheses are introduced into the mouth, the density of teeth coming together and the dentures fixation are checked (it should be remembered that usually fixation improves by the 7th day of using the prosthesis).

Next visit

The first correction is administered on the next day after the delivery of the prosthesis, later - if medically required (no more than once every three days). The adaptation period can last up to 1.5 months.

If pain develops in the area of the prosthetic bed tissues associated with an injury to the mucous membrane, the patient is recommended to immediately stop using the prosthesis, visit the dentist, resuming the use of the prosthesis 3 hours before the visit to the dentist.

In case of mechanical damage to the mucous membrane, ulcers formation, the areas of the prosthesis in these places are minimally ground off. Correction of the prosthetic basis is carried out until the first subjective sensation of pain reduction appears.

Drug therapy with anti-inflammatory drugs and remedies that accelerate the oral mucosa epithelization is prescribed.

Patients with pronounced torus

When making a working model, it is necessary to make "insulation" in the torus area in order to prevent excessive pressure.

Patients with allergic reactions to plastic

If there is an allergy in the history, cutaneous tests are performed for the material of the prosthesis basis. In case of a positive reaction,

prostheses are made of colorless plastic, if medically required, the basis of the prosthesis is silvered.

For the patients with insufficiently favorable anatomical and topographic conditions of the prosthetic bed, the basis of the prosthesis can be made with a soft lining.

Indications:

- the presence of sharp bone protrusions on the prosthetic bed, an acute internal oblique line in the absence of absolute (clear) indications for surgical intervention in order to eliminate them;
- increased pain sensitivity of the oral cavity;
- the absence of a pronounced submucosal layer.

The need for the use of a soft lining is determined in the process of adaptation to a new prosthesis. Soft linings are made by a clinical and laboratory method according to a well-known technique.

7.1.7. Requirements for pharmaceutical outpatient medical care

Name of the group	Frequency (duration of treatment)
Analgesics, non-steroidal anti-inflammatory drugs, drugs for the treatment of rheumatic diseases and gout	According to the algorithm
Vitamins	According to the algorithm
Drugs that affect the blood	As needed

7.1.8. Characteristics of algorithms and features of the use of pharmacologic agents

The use of local anti-inflammatory and epithelizing agents in the development of wrinkles and ulcers on the mucous membrane, especially during the period of adaptation to the prosthesis, shows sufficient effectiveness in everyday dental practice.

Analgesics, nonsteroidal anti-inflammatory drugs. Remedies for the treatment of rheumatic diseases and gout

Usually, rinses and/or baths with decoctions of oak bark, chamomile flowers, sage are prescribed 3-4 times a day (level C evidence). Applications to the affected areas with buckthorn oil – 2-3 times a day for 10-15 minutes (level B evidence).

Vitamins

Applications with retinol oily solution to the affected areas – 2-3 times a day for 10-15 minutes (level B evidence).

Drugs that affect the blood

Deproteinized hemodialysate – adhesive paste for the oral cavity – 3-5 times a day on the affected areas (level C evidence).

7.1.9. Requirements for the regime of work, rest, treatment and rehabilitation

There are no special requirements.

7.1.10. Requirements for patient care and auxiliary procedures

There are no special requirements.

7.1.11. Requirements for dietary prescriptions and restrictions

Refusal to use very hard food that requires chewing hard pieces, from biting off pieces from hard foods, vegetables and fruits (for example, from a whole apple). Refusal to use very hot food.

7.1.12. Additional information for the patient and his family members

See Appendix № 1.1 to this protocol for the management of patients.

7.1.13. Rules for changing requirements when implementing the protocol and terminating the protocol requirements

If signs requiring preparatory measures for prosthetics are detected during the diagnosis, including the presence of tooth roots, exostoses, etc., the patient is transferred to the patient management protocol corresponding to identified diseases and complications.

If signs of another disease requiring diagnostic and therapeutic measures are detected, along with signs of complete secondary adentia, medical care is provided to the patient in accordance with the requirements of:

- the section of this protocol for the management of patients corresponding to the management of complete secondary adentia;
- protocol for the management of patients with an identified disease or syndrome.

7.1.14. Cost characteristics of the protocol

The cost characteristics are determined according to the requirements of regulatory documents.

VIII. GRAPHICAL, SCHEMATIC AND TABULAR REPRESENTATION OF THE PROTOCOL

Not applicable.

IX. MONITORING

CRITERIA AND METHODOLOGY FOR MONITORING AND EVALUATING THE EFFECTIVENESS OF THE PROTOCOL IMPLEMENTATION

Monitoring is carried out throughout the entire territory of the Russian Federation.

The list of medical organizations where this document is monitored is determined annually by the institution responsible for monitoring. A medical and preventive institution is informed about the inclusion in the list of monitoring protocols in writing.

Monitoring includes:

- collecting information: about the management of patients with diabetic foot syndrome in medical and preventive institutions at all levels;
- analysis of the data received;
- making a report on the results of the analysis;
- submission of a report to the group of developers of this protocol.

The initial data for monitoring are:

- medical documentation – medical card of a dental patient (form 043/u);
- tariffs for medical services;
- tariffs for dental materials and medicines.

If necessary, other documents may be used for monitoring.

In medical and preventive institutions defined by the monitoring list, a patient's card is drawn up every six months on the basis of medical documentation (Appendix 1.2) on the treatment of patients with partial absence of teeth corresponding to the patient's models in this protocol.

The patient's card (Appendix 1.2) includes data on the diagnosis and treatment of patients who were given orthopedic structures during the last month of the current half-year. The certificates are sent to the institution responsible for monitoring, no later than one month after the end of the specified period. For example, if monitoring started on May 1, then the certificate includes all patients with complete secondary adentia who received orthopedic structures in October, the report must be submitted no later than the end of November. The number of analyzed cases should be at least 300 per year.

The indicators analyzed in the monitoring process include: criteria for inclusion and exclusion from the protocol, lists of mandatory and additional medical services, lists of mandatory and additional medicines, disease outcomes, the cost of delivering medical care according to the protocol, etc.

PRINCIPLES OF RANDOMIZATION

This protocol does not provide for randomization (of medical and preventive institutions, patients, etc.).

THE PROCEDURE FOR EVALUATING AND DOCUMENTING SIDE EFFECTS AND COMPLICATIONS DEVELOPMENT

Information about side effects and complications that developed when making the diagnosis and performing the patients' treatment is recorded in the patient's medical record (Appendix 1.2) and is reflected in the certificate of the treatment performed, submitted to the organization responsible for monitoring.

INTERIM EVALUATION AND INTRODUCTION OF MODIFICATIONS TO THE PROTOCOL

The assessment of implementing the protocol is carried out once a year based on the results of the analyzing the information obtained during monitoring.

Introduction of modifications to the protocol is made if information is received:

a) that the Protocol contains requirements that cause harm to the health of patients,

b) upon receipt of convincing data on the need to change the requirements in the protocol of the mandatory level.

The decision on changes is made by the development team. Introduction of changes to the requirements of the protocol into effect is carried out by the Ministry of Health and Social Development of the Russian Federation in accordance with the established procedure.

PARAMETERS FOR ASSESSING THE QUALITY OF LIFE WHEN IMPLEMENTING THE PROTOCOL

To assess the life quality of a patient with partial absence of teeth, corresponding to the protocol models, an analog scale is used (Appendix 1.3).

COST ESTIMATE OF IMPLEMENTING THE PROTOCOL AND THE QUALITY PRICE

The clinical and economic analysis is carried out in accordance with the requirements of regulatory documents.

COMPARISON OF RESULTS

When monitoring the protocol, the results of meeting its requirements, statistical data, indicators of the activities performed by medical and preventive institutions (the number of patients, the number and types of manufactured structures, the production time, the presence of complications) are compared annually.

THE PROCEDURE FOR GENERATING THE REPORT AND ITS FORM

The annual report on the results of monitoring includes quantitative results obtained during the development of medical records, and their qualitative analysis, conclusions, suggestions for updating the protocol.

The report is submitted to the group of developers of this protocol. The materials of the report are stored in the Department of Standardization in Healthcare of the Scientific Research Institute of Public Health and Health Management at I.M. Sechenov Moscow Medical Academy under the Ministry of Health of the Russian Federation and is stored in its archive.

The results of the report can be published in public media.

Appendix 1.1
To the protocol of patients management
"Completely absent dentition
(Complete secondary adentia)"

RULES FOR THE USE OF REMOVABLE DENTURES
(Additional information for the patient)

1. Removable dentures should be cleaned with a toothbrush with paste or with toilet soap twice a day (in the morning and in the evening), as well as after meals, whenever possible.

2. In order to avoid damage to the prosthesis, as well as damage to the oral mucosa, it is not recommended to take and chew very hard food (for example, crackers), to bite off large pieces (for example, from a whole apple).

3. At night, if the patient removes the prostheses, they must be kept in a moist environment (after cleaning, wrap the prostheses in a wet cloth) or in a vessel with water. You can sleep in prosthetics.

4. To avoid damage to the prostheses, do not allow them to fall on the tile floor, in the sink and on other hard surfaces.

5. As a hard plaque forms on the prostheses, they must be cleaned with special means that are sold in pharmacies.

6. If there is a violation in fixation of the removable prosthesis, which may be associated with weakening of the clamp fixation, it is necessary to contact the orthopedic dentistry clinic to activate the clamps.

7. In any case, under any circumstances, do not try to make corrections, repairs or other effects on the prosthesis yourself.

8. In the event of a breakdown or a crack in the base of the removable prosthesis, the patient must urgently contact the orthopedic dentistry clinic to repair the prosthesis.

Appendix 1.2
*To the protocol of patients management
 "Completely absent dentition
 (Complete secondary adentia)"*

PATIENT'S CARD

Case History № _____
 Name of the institution _____
 Date: start of follow-up _____
 Full name _____
 end of follow-up _____
 age _____
 Main Diagnosis _____
 Concomitant Diseases: _____
 Patient's Model _____
 The extent of non-medicinal medical aid provided: _____

Code	Name	Mark of completion (multiplicity)
Diagnostics		
01.02.003	Palpation of muscles	
01.04.001	Taking the history and complaints in pathology of joints	
01.04.002	Visual examination of joints	
01.04.003	Palpation of joints	
01.04.004	Percussion of joints	
01.07.001	Taking the history and complaints in oral pathology	
01.07.002	Visual examination in oral pathology	
01.07.003	Palpation of the oral cavity organs	
01.07.005	Inspection of the maxillofacial region	
01.07.006	Palpation of the maxillofacial region.	
01.07.007	Determining the degree of mouth opening and restriction of the mandible's mobility	
02.04.003	Measurement of joint mobility (goniometry)	
02.04.004	Auscultation of the joint	

Code	Name	Mark of completion (multiplicity)
02.07.001	Oral examination with the help of additional tools	
02.07.004	Anthropometric studies	
06.07.001	Panoramic radiography of the maxilla	
06.07.002	Panoramic radiography of the mandible	
09.07.001	Examination of impression smears of the oral cavity	
09.07.002	Cytological examination of the oral cyst (abscess) contents or the contents of a dental pocket	
11.07.001	Biopsy of the oral mucosa	
Treatment		
16.07.026	Prosthetics with partial removable laminar dentures	
D01.01.04.03	Correction of a removable orthopedic structure	
25.07.001	Administration of drug therapy for diseases of the oral cavity and teeth	
25.07.002	Administration of diet therapy for diseases of the oral cavity and teeth	

Medicamentous Aid (specify the drug used):

Drug complications (specify the manifestations):

The name of the drug that caused them:

Outcome (according to the outcome classifier):

Information about the patient was passed to the institution monitoring the Protocol:

(name of the institution) (date)

Signature of the person responsible for monitoring the Application standard in a medical institution:

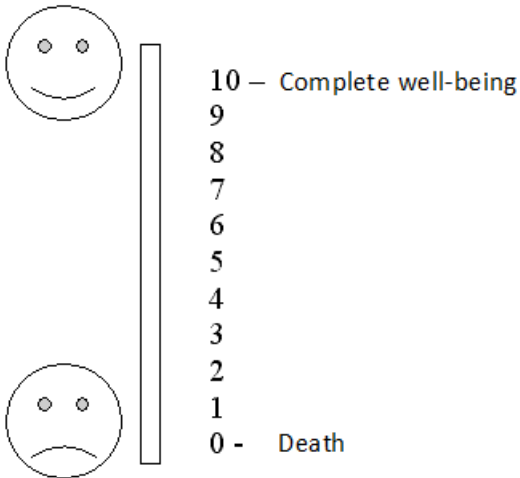
Appendix 1.3
To the protocol of patients management
"Completely absent dentition
(Complete secondary adentia)"

PATIENT QUESTIONNAIRE

FULL NAME _____

DATE OF FILLING IN HOW DO YOU ASSESS YOUR
OVERALL HEALTH TODAY?

Please mark the value corresponding to your state of health on
the scale.



Appendix 1.4
To the protocol of patients management
"Completely absent dentition
(Complete secondary adentia)"

LIST OF DENTAL MATERIALS

GROUP NAME

MANDATORY ASSORTMENT:

- standard impression trays for edentulous jaws
- alginate impression material
- baseplate wax
- cold-curing resin for manufacturing custom spoons
- articulator
- adhesives for silicone impression masses
- silicone impression mass for taking a functional impression
- zinc-eugenol impression mass for taking a functional impression
- color scale for determining the color of artificial teeth
- a special marker for determining the place of correcting the basis of the prosthesis (pencil, ink)
- dental plaster
- straight hand-piece
- metal cutters for plastic for a straight hand-piece
- polishers
- a cup for mixing impression materials
- a spatula for mixing impression compounds
- stones for a straight hand-piece
- articulation paper
- dental spatula
- oblique heating plane

SUPPLEMENTARY ASSORTMENT:

- adhesive plaster (for gluing the edges of a standard baseplate tray)
- metal gauze to increase the strength of the prosthesis base
- elastic materials for prosthesis relocation in the clinic
- Die stone
- individually adjustable articulator with a facial arch

Appendix 1.5
*To the protocol of patients management
"Completely absent dentition
(Complete secondary adentia)"*

BIBLIOGRAPHY

1. Bushan M.G., Kalamkarov H.A. Complications in dental prosthetics and their prevention. – Kishinev, 1983. – 301 p.
2. Kalinina N.V., Zagorsky V.A. Prosthetics in complete adentia. – M., 1990. – 224 p.
3. Kopeikin V.N., Mirgazitov M.Z. Orthopedic dentistry: textbook. – 2nd ed., suppl. – M., 2001. – 624 p.
4. Kopeikin V.N. Errors in orthopedic dentistry. – M., 1986. – 176 p.
5. Maliy A.Yu. Medical and legal justification of medical care standards in the clinical practice of orthopedic dentistry: dis. ... Doctor of Medical Sciences. – M., 2001. – 272 p.
6. Guide to orthopedic dentistry / ed. by V.N. Kopeikin. – M., 1993. – 496 p.
7. Rybakov A.I., Baziyan G.V. Epidemiology of dental diseases and ways of their prevention. – M., 1973. – 320 p.
8. Reference book in Dentistry / ed. by V.M. Bezrukov. – M., 1998. – 656 p.
9. Dental morbidity of the Russian population / ed. by E.M. Kuzmina. – M., 1999. – 228 p.
10. Khvatova V.A. Diagnostics and treatment of functional occlusion disorders: manual. – N. Novgorod, 1996. – 276 p.
11. Cronstrom R., Rene N., Owall V., Blomqvist A. The Swedish patient insurance scheme and guarantee insurance for prosthodontic treatment // International Dental Journal. – 1992. – Vol. 42. – P. 113–118.
12. Einheitlicher Bewertungsmaßstab fuer Zahnaerztliche Leistungen (BEMA): Aktuelle Ergaenzungen. Stand 01.01.1999. – Herne, 1999. – 214 s.
13. Gebuehrenordnung fuer das Zentrum fuer Zahn-, Mund- und Kieferheilkunde. – vom 28.09.1994. – No 415.436. – Zuerich, 1994. – 27 s.
14. Gebuehrenordnung fuer Zahnaerzte (GOZ). Stand 01.01.1996. – Koeln, 1998. – 72 s.

15. Heners M. Die Bedeutung allgemein anerkannten Regeln und ihrer Kriterien fuer die Qualitaetsdiskussion in der Zahnheilkunde // Dtsch. zahnaerztl / Ztschr. – 1991. – Bd. 46. – S. 262.

16. Kerschbaum Th., Micheelis W., Fischbach H. Prothetische Versorgung in Ostdeutschland: Eine bevoelkerungsrepraesentative Untersuchung bei 35 bis 54-Jaehrigen // Dtsch. zahnaerztl / Ztschr. – 1996. – Bd. 51. – S. 452–455.

17. Kerschbaum Th., Micheelis W., Fischbach H., von Thun P. Prothetische Versorgung in der Bundesrepublik Deutschland: Eine bevoelkerung srepraesentative Untersuchung bei 35 bis 54-Jaehrigen // Dtsch. zahnaerztl / Ztschr. – 1994. – Bd. 49. – S. 900–994.

18. Koslowski P. Aerztliches Engagement und ration ale Entscheidungsregeln // Dtsch. zahnaerztl / Ztschr. – 1991. – Bd. 46. – S. 182–185.

19. Lang N.P. Checkliste zahnaertzliche Bahandlung-splanung. – Stuttgrt; New York, 1988. – 213 s.

20. Miller A.J., Brunelle J.A., Carlos J.P., Brown L.J., Loe H. Oral Health of United States Adults: National Findings. – US Department of Health and Human Services, Public Health Services, National Institute of Health. – 1987. – 112 p.

21. Oral heals surveys. Basic methods. – Geneva, 1987. – 512 p.

22. Pahnke D., Schwanewede H. Das ORATEL Projekt: Qualitaetssicherung und Entscheidungsun-terstuetzung // Qualitaetssicherung in der Zahn heilkunde. – Heidelberg, 1995. – S. 77–90.

23. Qualitaetsrichtlinien fuer zahnmedizinische Arbeiten. – Bern, SSO, 1999. – 193 s.

24. Qualitaetssicherung in der Zahnheilkunde. – Heidelberg, 1995. – 167 s.

25. Seznam zdravotnich vykonu s bodovymi hodnotami 1998. – Praha, 1998. – 623 p.

26. Sinha M. Qualitaet und Wirtschaftlichkeit in derzahnmedizinischen Versorgung // Beitraege zur Qualitaetssicherung in der Zahnmedizin. – Baden-Baden, 1993. – S. 38–50.

27. Wirksamkeit und Effektivitaet in der Zahn heilkunde: neue Konzepte in der Diagnostik und Therapie. – Heidelberg, 1997. – 106 s.

LIST OF REFERENCES

1. A flabby ridge. – M.: Internet resource "All Dentistry", 2017. – URL: https://vk.com/wall-36403122_7539.
2. Atrophy of the alveolar process. – M.: Handbook of Dentistry, 2014. – URL: <https://rsdent.ru/adentiya-pervichnaya-polnaya-prikusamolochnyh-zubov>
3. Characteristics of the oral mucosa. – Kyiv: Internet portal "Dental Center of Smiles", 2017. – URL: <http://smile-center.com.ua>.
4. Characteristics of the oral mucosa. – M.: Internet portal "Dial-Dent" Dental Center, 2017. – URL: <https://dial-dent.ru>.
5. Characteristics of the oral mucosa. – M.: Internet portal "Club of Dentists", 2017. – URL: <https://stomatologclub.ru>.
6. Dental caries. – M.: Internet portal "Dental portal", 2016. – URL: <http://zubki.ucoz.com/index/0-19>.
7. Differentiated functional impressions. – M.: Internet site "Club of Dentists", 2017. – URL: <https://stomatologclub.ru>.
8. Enamel hypoplasia. – M.: Electronic resource "Alexander Dante Clinic", 2016. – URL: <http://microdent.ru>.
9. Enamel hypoplasia. – M.: The Internet portal "Create your smile", 2017. – URL: <https://createsmile.ru/gipoplaziya-emali>.
10. Kopeikin V.N. Orthopedic dentistry: textbook / V.N. Kopeikin, M.Z. Mirgazitov. – 2nd ed., suppl. – M.: Medicine, 2001. – 355 p.
11. Lebedenko I.Yu. Guide to practical classes in orthopedic dentistry: textbook / I.Yu. Lebedenko, V.V. Elichev, B.P. Markov; ed. by B.P. Markov. – M.: SEI of ARESMC under the Health Ministry of the Russian Federation, 2001. – Part 1. – 231–293 p.
12. Orthopedic dentistry: a textbook for students / N.G. Abolmasov, N.N. Abolmasov, V.A. Bychkov, A. Al-Khakim. – M.: MEDpress-inform, 2013. – 576 p.
13. Parodontitis. – Kyiv: Internet portal "Dental Center of Smiles", 2017. – URL: <http://smile-center.com.ua>.
14. Parodontitis. – M.: Dental Portal, 2017. – URL: <https://stomport.ru/stati/parodontit>.
15. Periodontitis of the tooth – causes, symptoms, treatment. – M.: Medical Online Encyclopedia, 2017. – URL: <http://simptomylechenie.net/periodontit-zuba>.
16. Protocol for the management of patients with complete adentia. – M.: The official website of the Dental Association of Russia. 2017. – URL: http://www.e-stomatology.ru/director/prikaz/protokol_vedenia/p_adentia.htm

17. Senile progenia malocclusion of elderly people or a problem of any age. – URL: <http://orto-info.ru/zubocheliustnye-anomalii/okklyuzii/starcheskaya-progeniya.html>.

18. Sinelnikov R.D. Atlas of human anatomy: textbook / R.G. Sinelnikov; ed. by R.G. Sinelnikov. – M.: Publishing House Medicine, 1972. – Vol. 1. – 90 p.

19. The method of compression molding. – St. Petersburg: The Internet site "Dentservice. Dental Laboratory", 2017. – URL: <http://ds-lab.ru/technology/ivocap/>.

20. The method of flow molding. – St. Petersburg: The Internet site "Dentservice. Dental Laboratory", 2017. – URL: <http://ds-lab.ru/technology/ivocap/>.

CONTENTS

PREFACE	5
Lesson 1. COMPLETELY ABSENT DENTITION. ETIOLOGY. CLINICAL MANIFESTATIONS. CHANGES IN THE MAXILLOFACIAL REGION IN PATIENTS WITH COMPLETELY ABSENT DENTITION	6
Lesson 2. METHODS OF FIXING AND STABILIZING REMOVABLE DENTURES IN COMPLETELY ABSENT DENTITION.....	20
Lesson 3. METHODS OF MANUFACTURING INDIVIDUAL BASEPLATE TRAYS [26].....	24
Lesson 4. FITTING OF INDIVIDUAL BASEPLATE TRAYS. FUNCTIONAL TESTS USING HERBST'S METHOD	31
Lesson 5. FUNCTIONAL IMPRESSIONS, CLASSIFICATION. RATIONALE FOR CHOOSING IMPRESSION MATERIALS. THEIR CHARACTERISTICS. THE METHOD OF OBTAINING UNLOADING, POSITIVE PRESSURE AND DIFFERENTIATED IMPRESSIONS.....	37
Lesson 6. DETERMINING THE CENTRIC JAW RELATION OF EDENTULOUS JAWS.....	42
Lesson 7. RULES AND METHODS OF DESIGNING ARTIFICIAL DENTITIONS.....	49
Lesson 8. PRINCIPLES OF FITTING AND APPLYING DENTURES IN COMPLETELY ABSENT DENTITION	54
Lesson 9. FULL REMOVABLE PROSTHESES WITH A BILAMINAR BASE.....	61
Lesson 10. REACTION OF PROSTHETIC BED TISSUES TO COMPLETE REMOVABLE PROSTHESES	69
CONCLUSION	74
APPENDIX. PROTOCOL OF PATIENT MANAGEMENT "COMPLETELY ABSENT DENTITION (COMPLETE SECONDARY ADENTIA)"	75
LIST OF REFERENCES.....	100

Educational edition

FEDOROVA Nadezhda Stanislavovna
VIKTOROV Vladimir Nikolaevich

DENTAL ORTHOPEDIC REHABILITATION OF PATIENTS
WITH COMPLETELY ABSENT DENTITION

Educational and methodical manual

Editor *T.N. Knyazeva*
Computer layout and editing *E.V. Ivanova*

According to Law No. 436-FZ of December 29, 2010
this product is not labeled

Signed for publication on May 4, 2022. Format 60×84/16.
Newsprint paper. Offset printing. Times headset. Conv. oven l. 6,04.
Uch.-ed. l. 6,01. Circulation 250 copies. Order No. 541.

Chuvash University Press
Printing house of the university
428015 Cheboksary, Moskovsky prospect, 15

Учебное издание

ФЕДОРОВА Надежда Станиславовна
ВИКТОРОВ Владимир Николаевич

СТОМАТОЛОГИЧЕСКАЯ ОРТОПЕДИЧЕСКАЯ
РЕАБИЛИТАЦИЯ ПАЦИЕНТОВ
С ПОЛНЫМ ОТСУТСТВИЕМ ЗУБОВ

Учебно-методическое пособие

Редактор *Т.Н. Князева*
Компьютерная верстка и правка *Е.В. Ивановой*

Согласно Закону № 436-ФЗ от 29 декабря 2010 года
данная продукция не подлежит маркировке

Подписано в печать 04.05.2022. Формат 60×84/16.
Бумага газетная. Печать офсетная. Гарнитура Times.
Усл. печ. л. 6,04. Уч.-изд. л. 6,01. Тираж 250 экз. Заказ № 541.

Издательство Чувашского университета
Типография университета
428015 Чебоксары, Московский проспект, 15