



Complete Removable Dentures: Types, Stages of Manufacture and Features

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Abstract: Orthopedic systems with full adentia vary in comfort, appearance, material, and price. Synthetic composites based on polymethylacrylate (PMMA), ordinary and monomeric acrylic, polyurethane, and plastic composites are used for manufacturing. The dentist selects materials for complete removable dentures taking into account the structure of the jaw, the condition of soft and bone tissues.

Keywords: Orthopedic systems, polymethylacrylate (PMMA), monomeric acrylic, polyurethane.

Introduction: Types of complete removable dentures

Orthopedic systems with full adentia vary in comfort, appearance, material, and price. Synthetic composites based on polymethylacrylate (PMMA), ordinary and monomeric acrylic, polyurethane, and plastic composites are used for manufacturing. The dentist selects materials for complete removable dentures taking into account the structure of the jaw, the condition of soft and bone tissues.



Removable plate prosthesis design

Components of a removable plate prosthesis:

- Artificial gum (base) made of polymer, in which artificial teeth are placed. The base transmits the chewing load to the mucous membrane of the prosthetic bed.
- Retaining clamps for fixation (only for partial dentures). These "hooks" cover the dental unit. They can be metal, plastic, or combined.
- Artificial teeth (crowns) perform the functions of chewing. The material of the crown is selected individually — plastic, metal ceramics, ceramics or metal alloys.

The boundaries of a lamellar denture

Upper jaw

In the toothless part of the jaw, the border of the base runs along the transitional fold of the gum, bypasses the buccal strands of the mucous membrane and the fold of the upper lip. The base is adjacent to the dental necks, covers the frontal group by 1/3 of the height, and the chewing area by 2/3 of the height, overlaps the palatine tubercles. The edge of the base is fixed on the posterior edges of the tubercles of the upper jaw.

Lower jaw

The border of the base runs in a toothless gap along the transitional fold of the gum between the frenules of the tongue and lip. The base of the mandibular prosthesis covers 2/3 of its teeth, so the plate does not sag and preserves the integrity of the mucous membrane. The base of the chewing teeth is rounded on the vestibular side of the lips and cheeks. The

mandibular protuberances are always fully or partially covered.

Indications for plate prostheses

- one tooth is missing (butterfly immediate prosthesis),
- violation of the contact between the dentition (bite plate for orthodontic treatment),
- the extent of the defect cannot be repaired with a dental bridge,
- too many teeth were removed (direct prosthetics),
- restoration of an injury or fracture of teeth (splint prosthesis),
- patient's refusal or inability to perform permanent prosthetics,
- contraindications to implantation,
- Replacement of a broken removable structure,
- Galvanism or the body's allergy to metal parts.

Advantages

- Complete removable dentures are the most affordable way to restore a lost dentition;
- sufficient aesthetics;
- rapid recovery of chewing function;
- Easy maintenance;
- the ability to install a removable orthopedic system on implants (except nylon systems).

Disadvantages

- Long habituation (the more massive the structure, the longer the adaptation takes);
- distortion of diction, taste sensations;

- restoration of chewing function by 60%;
- insufficient fixation on the lower jaw (with a flattened prosthetic bed, additional fixing gels must be used);
- the accuracy of the distribution and transmission of chewing pressure is reduced (most of it falls on the gum);
- soreness, chafing of the mucous membrane;
- risk of allergies, increased gag reflex;
- atrophy (loss) of the jaw tissues under the prosthetic bed.

Features for the upper and lower jaw

The removable prosthesis of both jaws is maintained by recreating a vacuum between the mucosa and the base of the structure. After installation on a row and biting, the air from under the base is removed, creating an area of low pressure. Due to this, the orthopedic system is held in place (attached to the gum).

- Mandibular models are attached exclusively to the gums, tightly covering the alveolar process.
- The maxillary muscles hug the alveolar ridge and overlap the palate. This increases the contact area, making it possible to firmly fix the structure, but reduces the comfort of wearing it.

With removable prosthetics, the orthopedic system must accurately recreate the anatomical shape of the prosthetic bed. Otherwise, it is impossible to achieve reliable stability – under any load, the artificial jaw will fly off.

Contraindications

- Allergy to the prosthetic material;
- Mental disorders;
- acute inflammations and infections of the oral cavity;
- progressive osteomyelitis, osteoporosis, osteonecrosis;
- malignant processes of the maxillofacial zone;
- epilepsy.

The stages of manufacturing a complete removable prosthesis

1. Taking casts. Impressions (digital or with an impression mass) are taken from the patient's jaws, which are used to produce a plaster model and a prosthetic template with specified base parameters.
2. Bite diagnosis. Determination of central occlusion, transfer of the research result to the articulator for correct reconstruction of bite features.
3. Manufacture of a prosthesis. After fitting, adjusting the template, the wax base is replaced with a permanent material. The bite is fixed, and the finished

orthopedic system is sanded and polished.

4. Installation. The prosthetic structure is fixed to the patient. The dentist makes recommendations regarding care, adaptation, and diet. At the stage of habituation, additional adjustments are possible – the product must be adjusted to the set parameters so that the patient is as comfortable as possible.

Alternative options

An alternative to the classic puller is removable, conditionally removable or non-removable orthopedic systems based on implants. Prosthetics on implants ensure reliable fixation of the structure, uniform distribution of chewing pressure.

Depending on the clinical situation, 2-8 artificial roots per 1 jaw act as supports. 2-4 implants are sufficient for a dense mandibular bone, and 6-8 titanium supports are required to install the prosthesis on a loose, air-bearing upper jaw. Removable systems are fixed to the supports by a spherical or beam fastening mechanism. Conditionally removable and non-removable – by screw or cement method.

Modern single-stage protocols (all on 4, all on 6) allow prosthetics to be performed in just 1 day. During installation, the implants are positioned at different angles, which avoids bone grafting. For non-removable prosthetics, both a bridge-like prosthesis and a segmented model can be used. In such cases, several bridge-like elements form the basis of the structure.

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