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RELATIVE STABILITY WITH FULL PROSTHETICS

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Abstract
In many patients suffering from complete adentia of both jaws for a long time, progressive bone loss is often observed, in which dental implants can only be installed in the anterior part of the lower jaw between the mental openings. Removable denture designs, especially those that are not supported by teeth, provide a questionable level of stability during operation.

Keywords: dental prostheses, absence of teeth, removable dentures.

Introduction:

The concept of relative stability takes into account the peculiarities of the movement of jaws and prostheses during the acts of swallowing, speech and chewing. The treatment strategy should be based on an assessment of each individual clinical situation with the adaptation of appropriate mechanical principles that ensure the stabilization of the prosthesis on the jaw crest. The surface area of the toothless upper jaw is usually larger than the same indicator on the lower one, therefore, there are much more possibilities for stabilizing the upper removable prosthesis. The specificity of the topography of the mandible ridge, the activity of the tongue and facial muscles, on the contrary, provoke relative instability of the removable structure on the mandible, in which, in addition, it is quite difficult to expand the boundaries of the prosthesis. Abutments for implants by the type of locators significantly improve the retention of removable structures, ensuring their antirotational stability.

The number and topography of the implant placement also affect the relative stability of the prosthesis, thus ensuring the fixation of the prosthesis on locators at least in the anterior part, which can ensure that it retains its retention even under conditions of deformation under occlusal load. Factors contributing to the displacement of the prosthesis include: movement of muscles in the areas of their attachment, the presence of excessive occlusal contacts during functioning, active interaction with the tongue. The resistance and retention of the prosthesis are largely determined by the volume of vertical and horizontal tissue reduction, since the stability of structures decreases with progressive bone loss.

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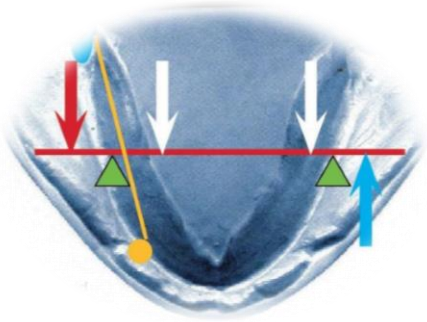
The mechanics of the lever. Understanding the lever system is basic when designing the design of occlusal circuits on removable dentures. The lever has a load and a lever arm with a fulcrum between them: when the force is applied near the fulcrum, the minimum displacement of the load is carried out.



When the force is applied further from the fulcrum, it is much easier to shift the load. Let's consider a scenario in which the resorption of the mandibular bone ridge progressed to a greater extent in the medial and downward direction. The ridge, in essence, is a lever, and the fulcrum points are represented on it in green.

If you draw a line outside the fulcrum on one side of the ridge (in the photo in orange) and continue it on the same side of the jaw (again bypassing the fulcrum), then the downward force (white line) will pass just along the fulcrum points from different sides of the jaw, shifting the above–projected line against the residual ridge. A force (red arrow) applied laterally to any fulcrum will cause the line to detach from the fulcrum on the opposite side (blue arrow). A similar situation is observed with resorption of the alveolar ridge of the upper jaw.

The teeth in the prosthesis are modeled in such a way as to recreate the lingual occlusal scheme, as well as to limit the effect of non-vertical load vectors when the prostheses come into contact with the teeth.

The teeth in the distal areas are designed in such a way as to limit the contact of the upper lingual tubercles with the central pits of the teeth in the lower jaw. Let's consider the scenario on the arch of the upper jaw, when the bone was resorbed in the medial and posterior directions.

Starting in front of the residual ridge, you can continue this line posteriorly towards the solid sky by positioning the lever on the residual ridge in the frontal section. The forces applied in front of the lever separate the aforementioned line from the hard palate, and the contact of the teeth in front of the lever, therefore, displaces the prosthesis from the palate area. In a situation with extensive bone loss in the anterior area, contact between the frontal teeth contributes to the displacement of the prosthesis in the upper jaw, especially with deficient vertical and horizontal bone parameters. Therefore, such contact should be avoided. The force applied behind the fulcrum when closing, on the contrary, presses the denture against the hard palate. Biting off food involves cutting it with incisors with further frontal movement of the teeth, which in principle is independent of the main chewing cycle. Patients with full dentures are advised to push food more backwards to minimize incisor contact, and

immediately proceed to the chewing cycle. Thus, it will be possible to avoid displacement of the prostheses on both jaws.

Resume

When developing occlusal schemes for removable dentures, it is necessary to take into account the criterion of ensuring their relative stability, taking into account the ratio of teeth antagonists. Contact between the distal teeth, especially with significant bone ridge resorption, is carried out in a vertical direction along a teardrop-shaped trajectory of movement. Occlusal contact during mouth closure should be limited and shifted lingually to ensure the maximum possible stabilization of removable prosthesis structures.

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