About the retromolar pad - its particularities and role in the stability and retention of the classic complete denture

Andreea Mariana Banateanu, Alexandra-Elena Biculescu, Misu Marian Babat, Paolo Di Francesco, Ioana Ana Maria Ciorniciuc, Mona Dardouk, Teodora Mihali, Anca Iuliana Popescu

Department of Speciality Disciplines, Faculty of Dental Medicine, “Titu Maiorescu” University, Romania

ABSTRACT

Aim. This paper aims to bring back into focus the area of the retromolar pad as an important element for the support area and for achieving an effective marginal seal in case of completely edentulous mandible.

Material and methods. 24 cases of complete mandibular edentation were analyzed and the characteristics of the retromolar pad were followed. Analyzing the appearance of the retromolar pad, an attempt was made to classify them into the classes proposed by J. Lejoyeux. The clinical implications of various aspects of this area were monitored.

Results. In patients with the retromolar pad in the last three classes, difficulties were encountered in adapting the individual tray and during the functional impression; in cases with advanced resorption of the alveolar ridge and unfavorable retromolar pad, a poor marginal seal was obtained.

Conclusions. From the analyzed cases, it was reconfirmed that in an old complete mandibular edentation, the retromolar pad can take an oblique or vertical position. Such a situation becomes unfavorable for the retention of the complete denture, for the marginal seal. Knowing the particularities of the completely edentulous prosthetic field and the clinical stages is essential for maintaining denture stability.

Keywords: retromolar pad, complete denture

INTRODUCTION

The mandibular support area has a bone substrate represented by the edentulous mandibular ridge, which is much smaller than the edentulous maxillary ridge, due to a higher resorption of the mandibular alveolar bone [1,2]. The mandibular support area is delimited in the vestibular region by the external oblique ridge – the seat of the lower insertion of the buccinator muscle, with fibers parallel to the periphery of the prosthetic field. The internal oblique ridge or mylohyoid ridge is located on the internal surface of the mandible, opposite the external oblique ridge. This ridge is the seat of the insertion of the mylohyoid and superior pharyngeal constrictor muscle (the fibers are inserted perpendicular to the periphery of the prosthetic field). Both the external and internal oblique ridges have a downward trajectory, from posterior to anterior. The internal oblique ridge descends anteriorly in continuation of the anterior border of the ascending ramus to the mental foramen [3-5].

The mandibular support area is delimited posteriorly by the retromolar pad, an anatomical formation that arises in place of the retromolar trigone following the extraction of the third molar. In its posterior third, the pterygomandibular ligament is inserted. The retromolar pad, also called piriformis papilla, has a somewhat horizontal position at first, with a bony substrate covered by a thick mucosa, adherent to the periosteum. As the alveolar bone in the immediate vicinity atrophies, the retromolar pad acquires an oblique or even vertical position [6,7]. Its bony substrate is reduced and the covering
fibrous mucosa can become soft and loose. Being a biostatic area, the retromolar pad represents a landmark for the positioning of the occlusion plane. The retromolar pad is also a key area for achieving marginal seal in the mandible [2,5]. Fibers from the temporalis muscle and from the superior pharyngeal constrictor muscle can sometimes reach this area which, through their contraction, can mobilize the prosthetic piece and at the same time masseter muscle fibers can reach the vestibular portion of the retromolar pad [1,2]. The analysis of the position, shape, volume of the retromolar pad and the relationship with the neighboring muscle formations are important elements for the extension of the prosthesis in this area. For the support and retention of the prosthesis this anatomical area must be covered by the prosthesis, in the anterior 2/3 [2,4,7,8].

MATERIALS AND METHODS

24 mandibular edentulous cases were selected from the cases of unimaxillary or bimaxillary complete edentation, in which it was decided to use classic acrylic complete dentures.

Analyzing the features of the mandibular prosthetic field, it was found that in a number of 9 patients with 6-7-year-old edentation, the resorption of the alveolar ridge is significant and the retromolar pad acquired an oblique position (Figure 1).

In 2 patients the pad underwent a phenomenon of intensive resorption that accompanied the resorption of the ridge and the edentulous ridge became thin and sharp - like a knife edge (Figure 2).

In patients with more recent edentations (2-3 years) the resorption of the alveolar ridges was less intensive, the retromolar pad stood out as a well highlighted formation with a horizontal position, covered with a thick, adherent fibro-mucosa, which allowed obtaining an optimal marginal seal (Figure 3).

Analyzing the appearance of the retromolar pad, an attempt was made to classify them into the classes proposed by J. Lejoyeux:

- Class I: favorable, firm, deeply adherent, convex
- Class II: less favorable, slightly convex, more mobile and compressible
- Class III: with low value and low and anterior insertion of the pterygomandibular ligament
- Class IV: worthless, unusable as a support of the prosthesis

From the analyzed cases, 8 patients presented a retromolar pad classified in the first class and as far as they were concerned the complete edentation was not older than 3 years; 2 patients were classified in the fourth class; 9 patients in the third class and 5 patients in the second class (Figure 4).
In patients with retromolar pad in the last three classes, difficulties were encountered in adapting the individual tray and during the functional impression (Figure 5); in cases with advanced resorption of the alveolar ridge and unfavorable retromolar pad, a poor marginal seal was obtained, which led to obtaining some “suction moments” of the prosthesis (Figure 6).

In two cases, it was found impossible to achieve marginal seal and the dentures showed lack of stability and retention, which required talking the patient into accepting more extensive implant-supported prosthetic restoration.

**DISCUSSIONS**

The analysis of the shape and dimensions of the edentulous mandibular alveolar ridge and the ret-
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romolar molar pad is an important stage for the support and stability of a complete mandibular prosthesis [2,4,8]. Some researches have shown comparative aspects of the transverse and longitudinal dimensions of this structure in relation to its shape (pear, round and triangular shape). The results showed that the pear and triangular shaped retromolar pads had a larger diameter as compared to round shaped pad. Different shapes of retromolar pad helps in stability of lower denture by increasing surface area. A horizontal position is correlated with a larger diameter and contributes to broader surface area and increases the stability of lower denture [9,10]. The horizontal position of the tubercle is most often associated with an average volume of it (class I/II Lejoyeux), which favors covering the anterior 2/3 with the prosthesis [2,4,11].

RESULTS

In order to obtain a marginal seal, especially at the level of the retromolar pad, it is important to analyze the clinical appearance of the mucosa and the adhesion to the underlying bone [2,4,5]. The mucosal substrate of the mandibular support area is not as adherent as in the maxilla. Due to the faster and stronger atrophy of the mandibular alveolar bone, the mucosa can become mobile on the periosteal surface and form folds, longitudinal loops parallel to the ridge. They are mostly found in the molar area of the edentulous ridge. In other cases, the alveolar bone atrophies a lot, and instead of the ridge with a firm bony substrate, only a thin, flabby mucosal ridge remains [2,3,7]. Analyzing these aspects in correlation with the volume and position of the retromolar pad, the most appropriate materials and impression technique can be chosen. For the clinical step of the impression, it is important to remember that in the region of retromolar pad, on its lingual side, longitudinal folds of the mucosa can be observed, which during the impression must be stretched through an appropriate impression technique, using thermoplastic materials; otherwise, these folds will be pressed between the mucosal face of the prosthesis and the surface of the edentulous ridge, causing pain and traumatic injuries to the mucosa. In addition, through a correct impression technique, the mucosa stretched towards the lingual periphery of the prosthetic field will contribute to the achievement of an effective external marginal seal on the polished lingual face of the prosthesis [2,4,5].

CONCLUSIONS

From the analyzed cases, it was reconfirmed that in an old complete mandibular edentation, the retromolar pad can take an oblique or vertical position. Such a situation becomes unfavorable for the retention of the complete denture, for the marginal seal. Knowing and analyzing the particularities of the retromolar pad in each individual case, the best decision can be made regarding the impression material, the impression technique and the surface of this pad that can be covered by the complete denture.

Clinical studies are necessary to further evaluate the relationship between the moment when teeth are lost in the distal mandibular area and the moment when a partial or total prosthesis is chosen. The retromolar pad is considered a clinical landmark for lower denture and helps for support and stability. It also plays an important role to determine the occlusal plane.

There are thus several research directions that can be continued.
Complete edentation is a challenge for the dentist, particularly when the patient does not want an implant-prosthetic denture for various reasons and opts for the classic restoration with complete dentures.


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