

Muscles of Facial Expression in Complete Denture Revisited

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Abstract

As a Prosthodontist to treat patients with complete denture prosthesis, that replaces missing teeth is a skillful job. A successful prosthesis requires a balance between different factors and must fulfill the criteria- of being in harmony with the surrounding oral environment and orofacial musculature and preservation of remaining structures and restores masticatory efficiency.

Muscle action influences the fabrication of denture at every step beginning from primary impression; border molding - final impression and jaw relations to teeth setting and finally successful retention, stability, and comfortable wearing of denture. A properly constructed denture helps the muscle to function in its physiological limit and maintain tonicity.

They are active during mastication, deglutition, and speech. Has a direct or indirect influence on the peripheral extensions, shape, and thickness of denture bases, the position of the teeth both horizontally and vertically, and facial appearance. Hence, in this review role of the facial muscle is presented here.

Keywords: Buccinator, Facial muscles, Modiolus, Orbicularis oris.

INTRODUCTION

Muscle is defined as an organ that by contraction produces movements of an organism: ^[1] a tissue composed of contractile cells or fibers that affects the movements of an organism or part of the body. Most of the orofacial muscles are striated skeletal muscles. The oro-facial muscles influencing complete denture prosthesis are muscles of facial expression, muscles of tongue, and muscles of the soft palate. The action of muscles as prime movers of the mandible and hence as the power for repeated occlusion of the teeth. They are active during mastication, deglutition, and speech. Has a direct or indirect influence on the peripheral extensions, shape, and thickness of denture bases, the position of the teeth both horizontally and vertically, and facial appearance. This review is focused on muscles of facial expression and its clinical implications in Prosthodontics.

ANATOMICAL DETAILS (FIGURE 1)

Orbicularis oris

This muscle rest on the labial flange and gingival third of anterior teeth. Its tone is determined by the support it receives. It has an important role in Orofacial function - swallowing, sucking, whistling, and chewing.

Buccinator (Figure 2)

In the lower jaw, the buccinator muscle becomes part of denture bearing area. The action of the buccinator does not dislodge the denture directly because the muscle fibers contract in a line parallel to plane of occlusion, but they are at the right angle to the fibers of masseter.^[2] When masseter contracts it pushes buccinator medially against the denture border in distobuccal area, causes powerful elevation of the mandible causing mouth to close. This is a dislodging force and the denture should be contoured to accommodate this interaction of muscles. This contour in the denture base is called masseteric groove.

The position of the attachment of buccinator muscle in the upper jaw determines the vertical height of distobuccal flange of the maxillary denture. The middle fiber of the buccinator muscle stretch anteroposteriorly during mastication to move a

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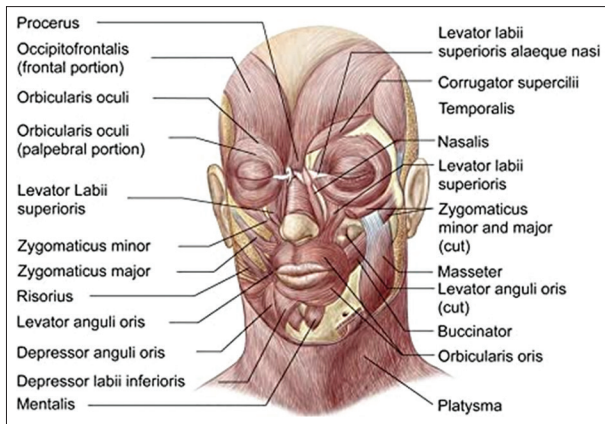


Figure 1: Muscles of facial expression

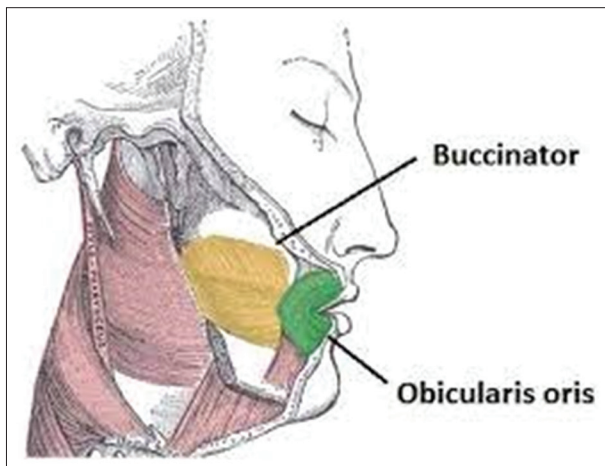


Figure 2: Buccinator and orbicularis oris

bolus of food inward between the opposing posterior teeth and then to press against their buccal surfaces to hold it there as the jaws close in mastication.^[3] In complete denture prosthesis, it helps in retention of the maxillary denture.

Modiolus (Figure 3)

It is a fibromuscular mass formed by the convergence of various muscles towards a focus just lateral to the buccal angle. It can be palpated most effectively using the opposed thumb and index finger to compress the mucosa and skin simultaneously.

It is formed by EIGHT muscles.^[4] They are divided into two groups which are in turn

1. Cruciate modiolar muscles –

- Zygomaticus major
- Levator anguli oris
- Depressor anguli oris
- Platysma pars modiolaris.

2. Transverse muscles –

- Buccinator
- Risorius
- Orbicularis oris
- Incisivus superior and inferior.

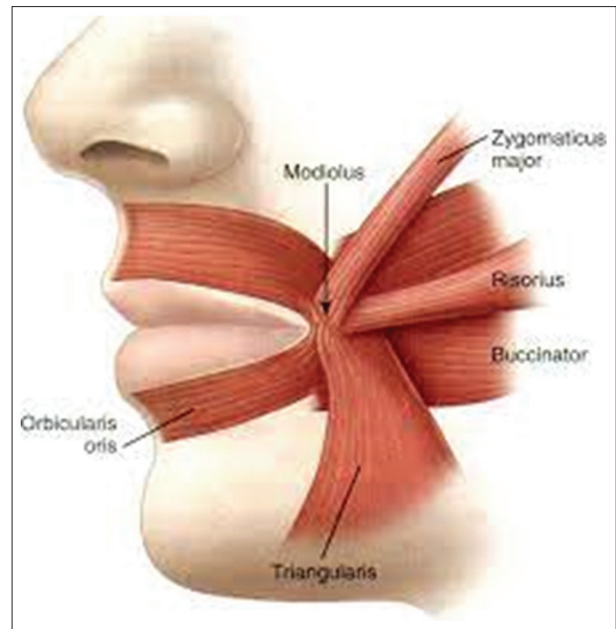


Figure 3: Modiolus

The contraction of modiolus presses the corner of the mouth against the premolars so that the occlusal table is closed in front. Food is crushed by the premolars and molars and it does not escape at the corner of the mouth.

PROSTHETIC SIGNIFICANCE

Role of muscles of facial expression on the borders of maxillary dentures

Labial flange of the denture

The labial frenum is a fold of mucous membrane and contains no muscle and has no action of its own. The main muscle of the lip is Orbicularis Oris, which forms the outer surface of the labial vestibule.^[5] On the other way round, as the fibers of the muscle run in the horizontal direction, the extent of the impression and thus the vertical height and thickness of flange is determined by this muscle action indirectly. The patient is advised to pucker the lips and suck to record the muscle activity (Figure 4).

Buccal flange of the denture

It lies in the buccal vestibule extending from the buccal frenum to the hamular notch. Buccal frenum – It is in relation with three muscles 1. Levator anguli oris – which lies beneath the frenum and affects its position. 2. Orbicularis oris – which pulls the frenum forward. 3. Buccinator – pulls it back. The buccal frenum is recorded either passively by pulling the cheek upward, outward, downward and inward, backward and forward simulating the movements of the frenum. Buccal vestibule – Width of the vestibule is influenced by the action of the buccinator. Distobuccal end of the flange is affected by the masseter and coronoid process. Hamular notch area is influenced by action of the buccinator and superior constrictor into pterygomandibular raphe.^[6]



Figure 4: Puckering of the lips

Role of facial muscles on the borders of mandibular dentures

Labial flange of the denture

It lies in the labial vestibule which extends from the buccal frenum of one side to the other and divided by the labial frenum in the midline.

Labial frenum

It contains a band of fibrous connective tissue that helps to attach to Orbicularis Oris. Hence this frenum is active and proper relief must be given to permit its movement. Hence, the lip is lifted outward upward and inward during border molding. The depth of the denture flange in the labial vestibule depends on the amount of bone resorption and the insertion and action of the muscles.^[7]

Orbicularis oris

Influences the flange thickness in the labial vestibular area of mandibular complete denture.^[8] When the mouth is open wide it becomes stretched narrowing the sulcus and if the flanges are thick it will displace the denture. Similarly, flange thickness would affect the lip support and aesthetics.

Mentalis

Elevates the skin of the chin and the lip outward. It renders the vestibule shallow. Thus it influences the thickness of the flange.^[9] It is capable of dislodging the denture if the ridge resorption is more and height of the ridge is same as that of the fornix of the vestibule.

Buccal flange of the denture

It lies on the buccal vestibule that extends from buccal frenum to the retro molar pad. Buccal frenum overlies the depressor anguli oris which moves it vertically and horizontally. Buccal vestibule is influenced by the buccinator muscle which is attached to the buccal shelf and the external oblique ridge. Distobuccal area of the vestibule is influenced by the action of masseter which presses inward against the buccinator.

DISCUSSION

The ultimate aim of the Prosthodontist is to restore form, function and esthetic so, an understanding of all the muscles of facial expression is important to successful complete denture construction.^[10] These muscles must be observed at work by the Prosthodontist when he first views his patient when begins to speak.

Complete dentures are primarily mechanical devices, since they function in the oral cavity, they must be designed in harmony with normal neuromuscular function. Facial muscles impart stabilizing force against complete dentures that serves in retaining the prosthesis rather than cause denture displacement.

All oral functions, such as speech, mastication, swallowing, smiling, and laughing, involve the combined actions of the tongue, lips, cheeks, and floor of the mouth which are very complex and highly individual. Failure to recognize the cardinal importance of oral muscles often results in dentures which are unstable and unsatisfactory, even though they were meticulously planned and constructed. As facial muscles play a crucial role in Prosthodontic management of geriatric patient, we should analyze and evaluate their Prosthodontic significance.

CONCLUSION

The facial muscles include a vital part of the Orofacial structure and are important both functionally and structurally. It influences a variety of factors many of which are under the control of the Prosthodontist.

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