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Torus mandibularis - obstacles and management: A review

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Abstract

Torus Mandibularis is a bony overgrowth usually found over lingual surface of mandibular premolar region. Being inherent in nature, it poses difficulty in fabrication and wearing of a denture as it may cause abrasion, ulceration and limited tongue space. For the convenience of patient, the dentist needs to use alternate methods to make impressions, provide relief under denture and at times modify the design of the prosthesis itself. The aim of this article is to review challenges posed by presence of lingual tori and their management during denture fabrication.

Keywords: Denture, impression, lingual tori, prosthesis, trauma

Introduction

Torus mandibularis (TM) is an exophytic osseous overgrowth that commonly occurs bilaterally and symmetrically over the lingual surface of the mandible in bicuspid region, superior to mylohyoid ridge (Figure 1). They are asymptomatic, slow-growing, self-limiting and painless growth, but sometimes, they may grow over several centimeters and create problem in the fabrication and wearing of removable dentures or prosthesis [1, 2]. They are generally bilateral (90% of cases), forming hard and rounded swellings [3, 4]. Mandibular tori can be seen in dentulous cases as well as edentulous cases. Its prevalence varies from 6%-7% among general population with mean age of diagnosis usually in fourth decade of life with higher incidence among males [5]. Tori are usually less than 2 mm in size. They may occur either unilaterally or bilaterally; single or multiple. Majority of the lesions appear as single bony nodules; bigger tori can appear as multi-lobulated. Rarely, TM may grow in size so much that contralateral TMs can meet in the midline ("kissing tori") [6-8].

Though the etiology behind development of Torus Mandibularis is still debated, unknown and unclear in the literature, they are postulated to develop as a functional reaction to excessive masticatory stresses [9]. Other documented causes include continued bony growth, genetics and certain environmental factors like bruxism, vitamin deficiency, diet, etc. Formation of TM is mostly seems to be buttressing bone formation in reaction to trauma from occlusal forces. This type of bone formation occurs with the aim to reinforce bony trabeculae for functional adaptation [7]. Bone flexion could lead to the release of bone morphogenic proteins (BMPs), which could stimulate osseous growth and result in bone thickening, lipping or exostosis at the areas of functional stress [7, 10]. Bone atrophy occurs when functional loads are low (less than 0.2% deformation); normal bone remodelling occurs when normal mechanical loads are present (0.2-0.25%); and bony hypertrophy occurs with increased lamellar bone, when higher mechanical loads are present (0.25- 0.4%). When pathologically higher loads are exerted (more than 0.40%), woven bone forms [7, 11, 12]. Mandibular torus is proposed to be formed by the excessive occlusal forces being exerted on cusps; force from palatal facet of upper teeth transmitted to the lingual facet of lower teeth or alveolar process. Thus, increased masticatory stress may be the major etiology for formation of TM, indicating parafunctional activity [7]. Johnson *et al.* [13] suggested an autosomal dominant mode of inheritance for development of this lesion while Eggen [14] documented that the development of TM has 30% genetic role and 70% environmental role.

TM is usually a single, smooth-surfaced, broad-based bony mass, however, bosselated or multi-lobulated forms also exist [15]. Tori are mostly asymptomatic, however patients may complain of ill-fitting dental prostheses, mucosal ulceration, abrasion or fear of oral cancer. In most of the cases, tori removal is not required, however, the most common indications for tori removal include ill-fitting dental prosthesis, chronic mucosal trauma, compromised oral functions and interference in making impression for denture base or framework [6, 7, 16]. Prefabricated impression trays can't seat to depth of lingual vestibule because of obstruction by this bony anatomical variant. These bony overgrowths can cause trauma and pain during impression making procedure, as only a thin soft tissue covering is present which gets traumatized easily [17]. Mandibular tori can also present challenges during laryngoscopy and endotracheal intubation [18, 19]. Lingual tori may also reduce and restrict the space for tongue and can result in difficult phonation and speech impediment [20].

Clinical diagnosis of TM is typically straightforward, and investigations including biopsy are generally not required. However, osteoma, peripheral ossifying fibroma, osteoid osteoma, osteochondroma, osteosarcoma and osteoblastoma should also be included in the differential diagnosis of a unilateral, fast-growing lesion. The presence of paresthesia or pain should be investigated promptly [21].

Discussion

Owing to benign innocuous self-limiting nature, TM does not require any intervention in most cases unless in the event of chronic tissue trauma or prosthodontic complications. The location, size and shape of TM are the important factors for prosthesis fabrication. Medium-to-large sized variants of TM, and premolar–molar site substantiates the need for changes and modification in prosthesis design or need for any surgical intervention before any removable partial dentures or complete denture can be constructed. The bilateral characteristic and nature of most cases of TM presents more challenge towards prosthodontic treatment, where the cross-arch stability is must for stable prosthesis.

Prosthetic management

The presence of mandibular tori can complicate removable denture fabrication, fixed prosthetic reconstruction and fabrication of any other oral appliance such as mouth guards, bruxism splints and orthodontic appliances [18, 22]. Making an accurate and satisfactory impression becomes difficult for clinicians and traumatic in patients with large-sized mandibular tori. It may obstruct lingual flanges of the mandibular stock impression tray and thus, prevent proper seating of the tray over mandibular ridge. Instead, the tray will seat on large mandibular tori or may lacerate the lingual soft tissues during impression making. This will result in a very painful and traumatic procedure for the patient and a poor ridge impression for the dentist [23].

Fernandez [24] used maxillary metal stock tray for taking impression of mandible with large tori. However, the maxillary tray restricts the space for tongue and creates resistance for proper seating of the tray. Moreover, the impression material in the centre of the tray may result in increased dimensional changes, and subsequently, result in an inaccurate cast. Yung – Tsung [23] used maxillary stock tray by removing palatal portion of tray and adding utility wax to modify the tray that will record lingual tori. Boksman and Carson [25] used a disposable thermoplastic heat mouldable

tray which was extremely stiff and made up of inflexible plastic material. The tray softens on heating in water at 70 °C for a few seconds, allowing reshaping to the required desired contour. The trays regain their normal rigidity in around 20 seconds after being heated, or when kept in cold water. Once the shape has been modified, even storing these thermoplastic trays for 2 hours at 40 °C shows no change in form [25, 26]

Large-sized mandibular lingual tori can interfere with the meticulous placement of conventional lingual bar in case of cast partial dentures. Unless surgery is refused by the patient or contraindicated, surgical excision of large-sized TM is the treatment of choice. Modifications in cast partial denture can be made which include strong, thick labial bar for rigidity and support. This labial bar connects the saddles on the both sides of a partial denture and can also incorporate an anterior saddle. It settles across the anterior labial mucosa and often buccally to the bicusps, preferably below the gingival margins of the teeth [27]. Conventional cast partial dentures give theoretical success especially in cases with bony prominences like TM. In such cases, flexible dentures provide a comfortable and optimum treatment option. Characteristic features of flexible denture include flexibility, virtually invisible, excellent esthetics, light weight, good retention, excellent strength, easy handling, non-invasive and comfortable. Patients with bilateral TM can be treated successfully and conservatively with flexible removable partial dentures [28].

Abrams S [29] fabricated a mandibular complete denture using a combination of three base materials. The denture base and buccal flange was fabricated using injection-moulded acrylic resins, a thermoplastic material was used for the fabrication of external portion of the lingual flange and a resilient material was used to line the entire denture, including the lingual flange. The thermoplastic material is comparatively rigid at mouth temperature but softens in hot water. Chemically, it is methyl methacrylate, therefore it bonds chemically with the denture base and the resilient liner. The end result is a semi-rigid lingual flange which slides easily over the mandibular tori. Resilient liners are commonly used as a cushion over the fitting surface of prosthesis for managing traumatized mucosa, ridge atrophy, bony undercuts and congenital oral defects requiring obturators. They provide uniform distribution of the functional load. These resilient liner prevents the thermoplastic lingual flange from locking around the torus and lessens the functional load on the torus [29]. Ezzat AKH *et al* suggested a modification to include butterfly-designed lingual major connector in removable partial denture to avoid surgery for excising large sized mandibular tori. The labial bar was thick and strong enough to overcome weakness of lingual major connector [30]

Surgical management

TM excision is indicated in following conditions [5, 15, 31, 32] :-
 1) Prosthodontic rehabilitation (Denture fabrication)
 2) Speech interference
 3) Interfere with tongue positioning
 4) Patient with poor oral hygiene around lower posterior teeth
 5) Traumatic ulceration or inflammation from mastication
 6) Cancer phobia
 7) Limitation of masticatory mechanics
 8) Sensitivity or pain due to thin mucosal layer
 9) Source of autogenous cortical bone graft

To surgically excise TM, a crestal incision or crevicular incision is made in region of the torus and mucoperiosteal flap is raised exposing the bony growth. Gauze piece may be placed between the lingual flap and the surgical space present below the torus. This will prevent the bone chips and debris

from getting displaced into sublingual and submandibular space [31, 32] Castro Reino *et al.* [31] advocated the use of a high speed handpiece and bur technique, as using chisel and mallet may involve risk of iatrogenic fracture of mandible; however, it should be taken into consideration the risk associated with handpiece which may cause emphysema formation. After trimming or excising the torus and repositioning the flaps, excess soft tissue can be excised with scissors. Meticulous suturing should be done using mattress technique. Surgical cement can also be used to guard the wound from trauma during healing, and also to provide antiseptic/antibacterial support if it contains an agent with these properties [31, 32].



Fig 1: Mandibular tori (Torus mandibularis)

Conclusion

Torus mandibularis, being benign in nature, is usually asymptomatic and does not require any surgical intervention unless it acts as interference in function and denture placement. The dentist needs to evaluate the tori based on their location, size and the possibility of hampering the design of denture framework. Based on these factors, one can decide to approach it in a conservative manner by providing relief under the denture using soft liner or can proceed with surgical excision.

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