

Torus Lesions of the Jaw: Diagnosis and Clinical Implications

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Abstract

Summary Background: Torus is a protuberant and lobulated exostosis that develops on the lingual aspect of the jaws or hard palate in 10-30% of adults. They can interfere with mastication, speech, oral hygiene, and denture placement. Their enlargement with advancing age may also lead to superficial ulceration, inflammation, osteonecrosis and various other complications. **Methods:** A retrospective analysis of the authors' experience with 17 adults who had large symptomatic tori was performed. The patients were examined by intraoral imaging and radiographic or computed tomography of their maxillofacial bones. Their dental and medical records were reviewed along with the pertinent literature concerning the prevalence and reported complications of this entity. **Results:** This series included 6 men and 11 women, ranging in age from 36 to 85 years (Mean age: 56.5 years). There were 6 patients with torus mandibularis, 8 with torus palatinus, and 3 with torus maxillaris. Four of our 17 patients required surgical excision of their tori because of large size, recurrent superficial erosions and associated symptoms. **Conclusion:** The majority of tori are asymptomatic and incidental finding, but the more prominent tori are prone to mucosal inflammation and ulceration that may require surgical removal of the lesion. Large tori can also interfere with mastication, speech, dental hygiene, placement and function of prosthetic dentures, and may cause snoring, sleep apnea or other complications. Therefore, the practicing physicians should be familiar with the appearance, radiological features, clinical implications and management of tori.

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What's known

Torus is an exostosis protruding from the lingual aspect of the jaws or hard palate. It develops in 10-30% of patients usually during their puberty and grows with advancing age.

What's new

Torus interferes with mastication, speech, dental hygiene, Placement of dentures, and may also lead to snoring and sleep apnea. An enlarged torus is prone to mucosal inflammation, ulceration, osteonecrosis and various other complications.

1 INTRODUCTION

Torus is a common benign exostosis of the jaw bones that develops in about 10-30% of the world population.¹⁻⁵ This pathologic condition is usually manifested around the age of puberty and continues to grow during adulthood. These lesions appear as lobulated protuberances on the lingual side of the jaws or hard palate. Most of them are asymptomatic and first noticed by the patients or detected incidentally by the dentists. However, large tori are often subject to traumatic mucosal inflammation and ulceration, as well as a wide spectrum of other complications that are described in this article. There are also instances when the patients seek advice from their primary care physician because of concern that an enlarging or ulcerated torus may represent an oral malignancy. Such cases can pose as a diagnostic challenge to the practicing clinicians who may not be well-informed about the appearance and potential implications of this abnormality.

2 METHODS

2.1 Study population

This retrospective study was based on a series of 17 adult patients with longstanding history of large symptomatic torus of their mandible, maxilla, or hard palate. Other cases of tori that were small or did not cause any subjective or objective symptoms were excluded. The reviewed 17 patients had been evaluated initially at the private dental office or university clinic, where their demographic data and symptoms were recorded and intraoral photographs of the torus lesions were obtained. They were then referred to our medical center for radiological examination. All had subsequent oral surgery consultation for possible removal of their tori.

2.2 Imaging techniques

Computed tomography of the maxillofacial region had been performed on 14 patients, and 5mm cross-sections of their jaws and hard palate were obtained. Plain radiographs of the same affected bones were done in frontal and lateral projections in 11 patients. Eight patients had both examinations, whereas 6 had

only computed tomography and 3 had only radiographs. The images were then correlated with the intraoral color photographs of the tori. Five illustrative cases were selected for presentation in this report.

2.3 Search strategy

An electronic search of medical and dental literature was conducted through PubMed bibliographic database for publications concerning the etiology, prevalence, complications, and management of tori. A total of 18 articles with relevant information that had been published during 1981-2019 period were selected for the cited references.

3 RESULTS

3.1 Demographic data and presenting symptoms

This series consisted of 6 men and 11 women, ranging in age from 36 to 85 years (Mean age: 56.5 years). All 17 patients were initially seen because of dental problems, but most of them also complained about longstanding symptoms that were directly related to the existing tori. These included ill-fitting dentures, interference with proper mastication and oral hygiene, impaired speech, and recurrent ulceration and inflammation of the gingival mucosa over the prominent tori. The majority of our patients had first noticed the development of tori in their third decade of life, with gradual enlargement throughout their adulthood.

3.2 Anatomic location of the lesions

A. Torus mandibularis

The 6 patients with torus mandibularis (**TM**) were 3 men and 3 women. On visual inspection their TM appeared as multi-lobulated masses on the inner aspect of bicuspid and premolar regions, with almost symmetrical extent on both sides. They measured 3-4 cm long, up to 1.5 cm thick, and covered by intact gingival mucosa. CT demonstrated the TM as lobulated exophytic masses of dense cortical hyperostosis, located bilaterally above the mylohyoid line (Figures 1 and 2).

B. Torus palatinus

Torus palatinus (**TP**) was present in 8 of our 17 patients and 6 of them were women. They had developed fungating masses of variable size and configuration that protruded into the oral cavity from the center of hard palate. The core of TP was a dense and lobulated exostosis as seen on radiographs and CT images (Figures 3 and 4). The mucosal coverage of TP was inflamed and ulcerated in 2 patients, but others had also experienced the same problem following repeated traumatic erosion by hard food items.

C. Torus maxillaris

Torus maxillaris (**TMAX**) had developed in 3 patients, one man and 2 women. These tori appeared bilaterally as prominent and lobulated masses arising from the medial aspects of the upper jaw. In contrast to TM, these were located more posteriorly along the molar regions. These tori were very firm on palpation and consisted of marked cortical hyperostosis on CT sections. One patient also had a coexisting TP as illustrated by CT and intraoral images (Figure 5).

3.3 Surgical intervention and follow- up

Four of our 17 patients required surgical resection of their tori because of their large size, recurrent superficial erosions and associated problems such as ill-fitting denture and periodontal disease caused by torus interference with oral hygiene. The excised lesions included 2 TP and 2 TM. The postoperative recovery of these patients was uneventful, with complete resolution of their prior symptoms. The other 13 patients had conservative management. Their follow up dental evaluation over a period of 5 to 8 years revealed stable appearance and size of the tori despite their often recurrent subjective symptoms related to the persistent torus abnormality.

4 DISCUSSION

4.1 Etiological consideration

Torus is a common benign exostosis that represents a developmental lesion appearing in puberty or early adulthood and becoming larger with advancing age. It has a hereditary etiology in about a third of cases. Curran et.al⁶ found TM and TP in 3 generations of women in one family. In the study by Eggen⁷, the genetic origin of TM was documented in 29.5% of patients. The remaining 70% were attributed to either environmental factors or mechanical issues caused by occlusal stress.^{4,5} There is a predilection for the development of TM and TMAX adjacent to the teeth receiving local stress because of excessive teeth grinding and jaw clenching, known bruxism.^{4, 5, 8}

4.2 Prevalence and manifestation age

The most common age range of patients is 10-30 years at the initial onset of torus development, but its growth may continue until the seventh decade of life.^{9, 10} There is a considerable variation in the prevalence of tori among populations of different ethnicity and gender. One study of 448 female residents of Washington, D.C., found that tori were present in 35% of African Americans, 32% of Caucasians, 30% of Hispanics, 38% of Asians, and 20% of Native Americans.²

Another investigation involving patients from Southern States of the United States revealed that 25% of Caucasian men and 24% of women had TM, whereas TMAX was present in 22% of men and 40% of women, respectively. In comparison, African Americans had TM in 18% of men and 13% of women, and they had TMX in 14% of men and 45% of women.¹

A high incidence of tori has been reported among the Asian population. Morita and associates found TM in 58% of healthy students at Hiroshima University in Japan.¹¹ Another study involving 1,520 dental patients in Thailand showed prevalence rates of 60.5% for TP, 32.2% for TM, and concurrent tori in 23.2% of the cases.¹² Most of the published large series show a female predominance for TP and a slight male predilection for TM.^{10, 13}

4.3 Clinical presentations and management

The majority of tori are asymptomatic and incidental finding during oral or dental examination. As they enlarge and become more prominent, however, they may cause a wide spectrum of problems. These include difficulty with placement and function of dentures, interference with mastication and speech, compression and displacement of the tongue causing snoring or sleep apnea.¹⁴ Furthermore, the tori can promote plaque formation and periodontal disease because of food retention hindering proper dental hygiene.^{3, 8}

Patients with large tori often experience recurrent mucosal ulceration and inflammation resulting from trauma by hard food items (Figure 5). Prominent tori may also interfere with endotracheal intubation during general anesthesia.¹⁵ There have been several reports concerning painful ulceration and osteonecrosis of torus in patients receiving biphosphonate for treatment of osteoporosis.¹⁶ In some instances, the larger symptomatic tori may necessitate surgical removal.^{3,17} This procedure was performed in 4 of our patients (Figures 2 and 4). The cited indications for the torus resection include interference with phonation or mastication, traumatic inflammation and ulceration, prosthetic instability, and in patients with cancerophobia.¹⁰ It may be of interest to note that a potential use of an excised torus has been its application as an autogenous bone graft in periodontal surgery and implants elsewhere.^{10, 18}

5 LIMITATIONS

The majority of published reports and herein cited references deal with the prevalence of tori among large populations of different ethnical and racial groups.^{1,2,5,8,11,12} Our study was limited to the clinical and radiological presentation of these lesions in a series of 17 patients that included 15 Caucasian and 2 African-American patients. The fact that 11 of 17 patients (65%) were women is slightly higher as compared to the reported prevalence of tori among women in the western world.¹⁻⁴ Furthermore, our series of cases was small to assess the true etiology or incidence of tori in our patient population. Nevertheless, this observational study and clinical review will provide updated information about this entity.

6 CONCLUSIONS

Torus represents a common pathologic abnormality that is well recognized by dental professionals, but this entity has received scant mention in the medical textbooks and literature. The lesion may be detected incidentally during a routine physical examination, or some patients may first seek medical advice because of their concern that the enlarging or ulcerated torus could be a malignant tumor. Therefore, it is important for the primary care physicians to be familiar with the appearance of these tori and their potential clinical complications. There is no evidence for malignant transformation of these tori, but the larger protuberant lesions causing significant symptoms may require referral to an oral surgeon for local resection. Although several causal factors have been postulated for the development of tori, the exact etiology of this condition in any individual patient may need further assessment to determine its underlying pathogenesis and possible genetic nature.

DISCLOSURES

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

GGG was responsible the conception and design of the study, radiological studies and manuscript preparation; DRN assisted in collecting clinical data and literature search; and ZKG provided the case material, dental records and intraoral photographs. All authors reviewed and approved the final manuscript.

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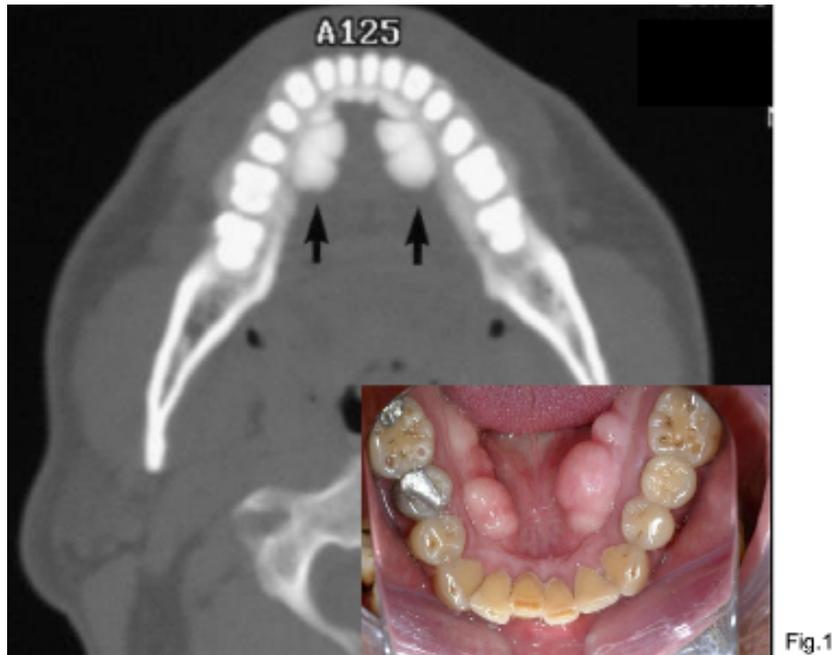
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Captions for Illustrations

Figure 1. Torus mandibularis (TM) in a 61 year-old man. CT section shows the prominent bilateral exostosis (arrows). Intraoral photograph (inset) demonstrates lobulated subgingival masses on the inner aspect of premolar regions. Figure 2. Torus mandibularis (TM) in a 58 year-old woman, presenting as very extensive osteomas on CT image (arrows), and as lobulated masses protruding medially on intraoral view (inset). She had progressive impairment of speech and mastication due to posterior displacement of the tongue and subsequently required surgical excision of the tori. Figure 3. Torus Maxillaris (TMAX) in a 47 year-old man. CT shows very prominent bilateral exostosis of the molar regions (large black arrows), minimal cortical thickening anteriorly (small arrows) and a coexisting TP (white arrow). Intraoral photograph also demonstrates the same tori (inset). Figure 4. Torus palatinus (TP) in a 72 year-old man. CT and intraoral images demonstrate the torus as a prominent multi-lobulated mass protruding from center of the hard palate (arrow). This torus was removed surgically because of its large size and recurrent ulceration of its mucosa. Figure 5. Torus palatinus (TP) in a 50 year-old woman. CT section shows the lesion as an exostosis of the hard palate. Photograph reveals superficial erosions and inflammation of its mucosal surface (arrows).



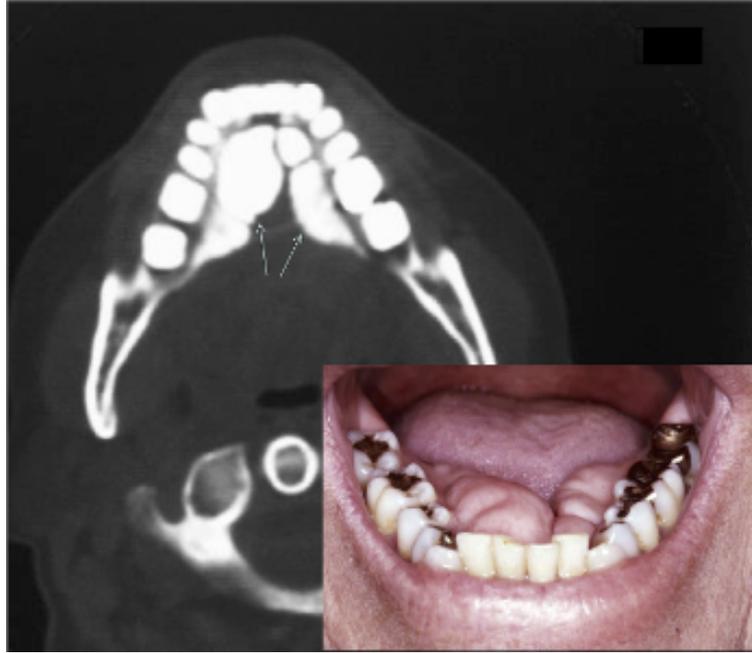


Fig.2

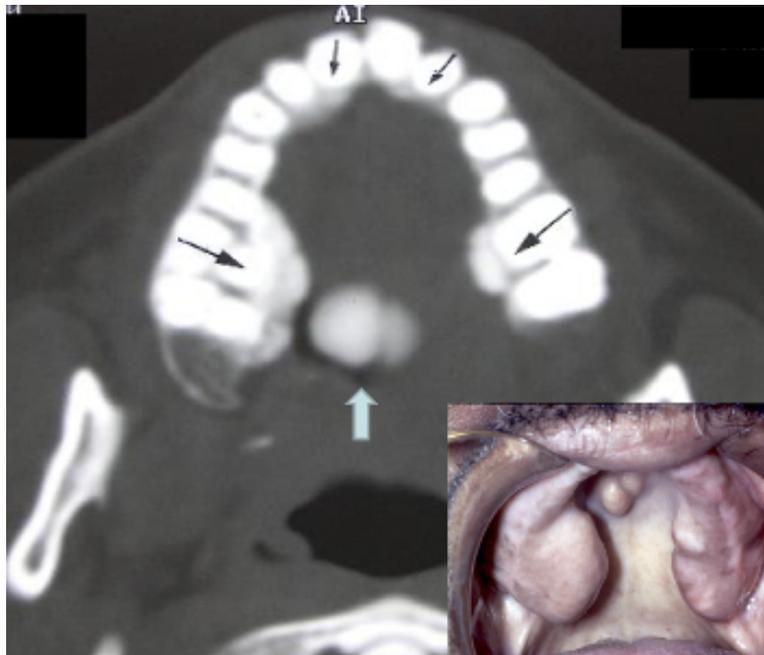


Fig.3

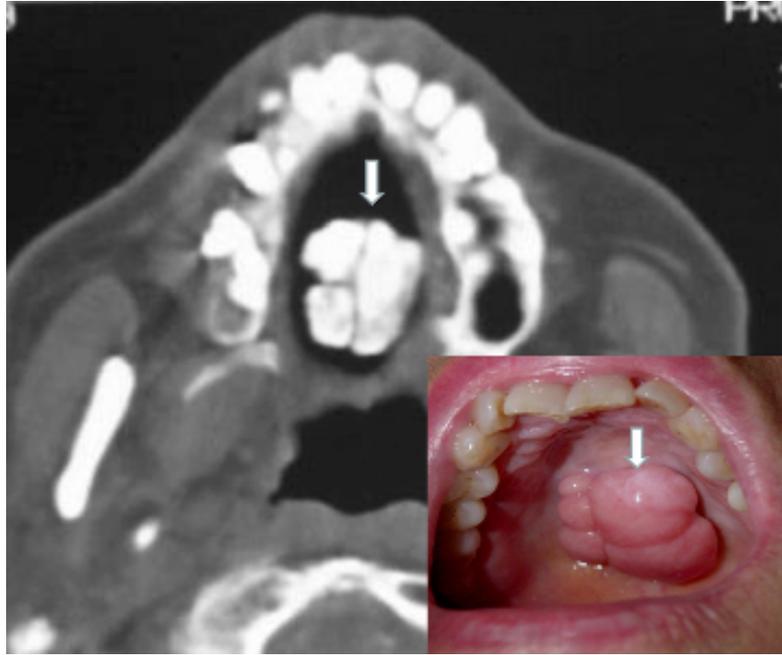


Fig.4

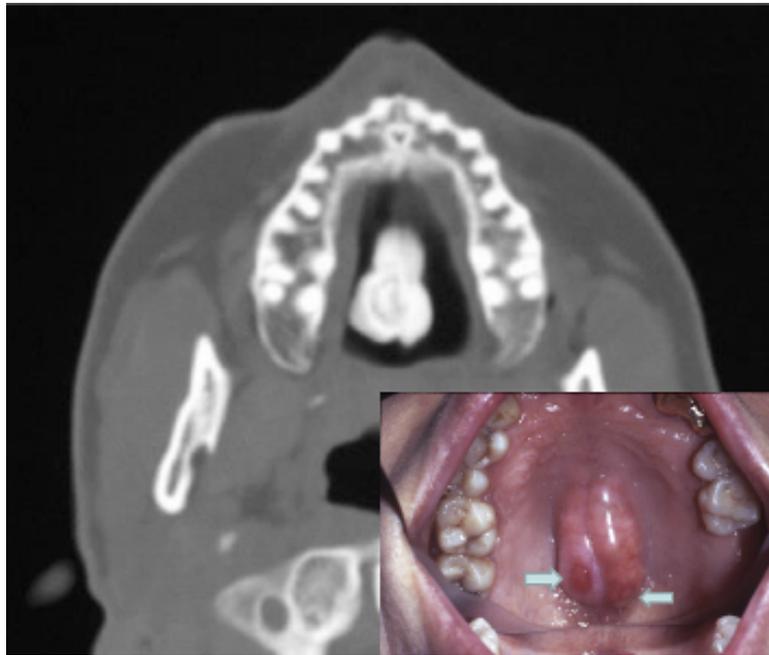


Fig.5