

Up-to Date Review And Case Report

Palatal torus: etiology, clinical aspect, and therapeutic strategy

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(Received: 24 June 2018, accepted: 17 December 2018)

Keywords:
palatal torus /
bone regularization /
protheztic
rehabilitation /
oral surgery

Abstract - Introduction: Maxillary palatal tori are benign bone tumors that elevate the median of the palate. Although there are clinical variations, palatal tori are characterized by pathognomonic clinical and radiographic criteria. **Observations:** Here, we present the cases of two patients with a voluminous palatal torus that caused functional problems in one and formed an anatomical obstacle to the fitting of a removable prosthetic in the other. Given their size, these tori were surgically removed under general anesthesia. The postoperative course was simple. **Discussion:** The etiology of palatal torus is usually multifactorial: genetic factors, masticatory forces, and parafunctions could all be factors in their development and growth. Considered as anatomical variations, palatal tori are asymptomatic in most cases and require no intervention. **Conclusion:** Surgical management is sometimes necessary to restore physiological orofacial functions or to allow the fitting of a prosthetic without harmful compromise.

Introduction

Palatal tori are benign bone tumors of the maxilla that elevate the midline of the palate on the cruciform suture, which connects the palatal and maxillary bones. They are neither neoplastic nor pathological and have a slow and progressive growth. Their discovery usually occurs during a routine clinical examination, sometimes by the patient. Considered as physiological anatomical variations, palatal tori generally do not require any specific treatment [1,2].

Two clinical cases are discussed here.

Observations

The first patient, Mrs. T, aged 55 years, was referred for a voluminous palatal torus, which had gradually increased in size since 2008 and caused functional discomfort and medically treated gag reflex. She had a history of anorexia nervosa and depressive syndrome that had been treated for several years, as well as ethyl-tobacco intoxication evaluated at 30 pack-years. Clinical examination revealed a large posterior palatal torus of approximately 30 × 10 mm covered by two erosive plaques associated with a discrete whitish plaque, most probably caused by trauma. In addition, the patient had occlusal attrition and erosions associated with bruxism and a history of chronic vomiting.

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The patient agreed to be weaned off the ethyl-tobacco and was referred to the addiction department of the same hospital (Figs. 1 and 2).

The second patient, Mrs. V, aged 70 years, was referred for a complete maxillary prosthetic rehabilitation due to subprosthetic carious lesions in the anterior joint crowns, which caused multiple sites of loosening. The latter did not present any notable medical or surgical antecedent. On examination, a median palatal torus, approximately 30 × 25 mm, that prevented the fitting of a completely removable prosthesis, which could not be fitted of a prosthetic without harmful compromises.

Surgical excisions of palatal tori were performed under general anesthesia, with nasotracheal intubation, in patient T with gag reflex and patient V with significant anxiety regarding the planned intervention. Antibiotic prophylaxis (amoxicillin 2 g), recommended for bone surgeries in the immunocompetent population (ANSM 2011), corticosteroid therapy (Solumedrol 1 mg/kg), and analgesic treatment (paracetamol 1,000 mg) were administered at anesthesia induction. A median palatal mucosal Y incision was made and a full thickness flap was elevated. Osteotomy and regularization procedure were performed under irrigation (Figs. 3 and 4). After rinsing, the edges of the flap were sutured.

After simulation of the torus excision on a study model, a thermoformed plate was immediately inserted in the case of patient T. In patient V, avulsion of the maxillary teeth was simultaneously performed as the placement of a removable palatal plate, based on the esthetic and functional assembly validated for use in prosthetic rehabilitation (Fig. 5).



Fig. 1. Palatal tori. (a) Palatal torus located in the posterior third of the hard palate with multiple erosive traumatic ranges (patient T). (b) Palatal torus located in the median third of the hard palate.

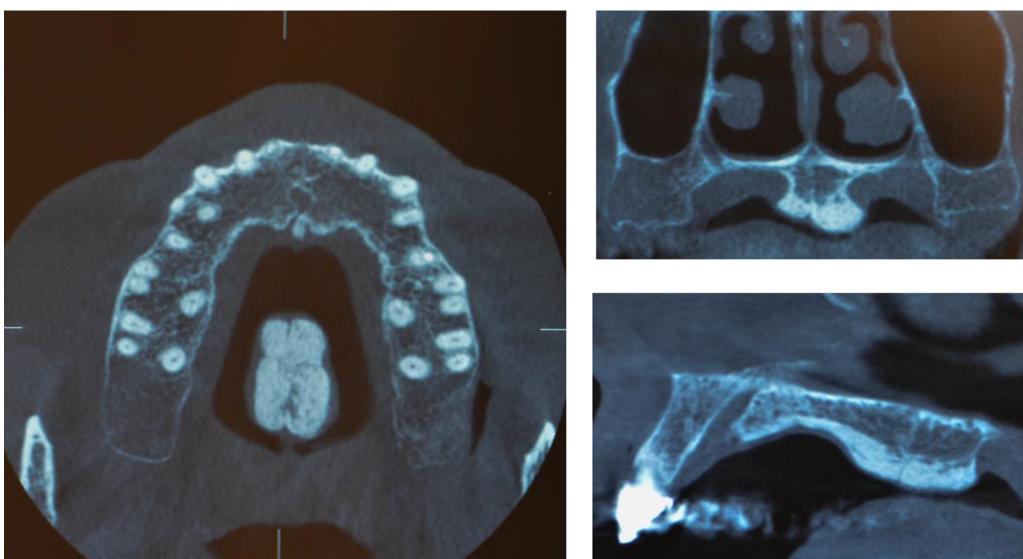


Fig. 2. Preoperative computed tomography scan of a posterior palatal torus (patient T).

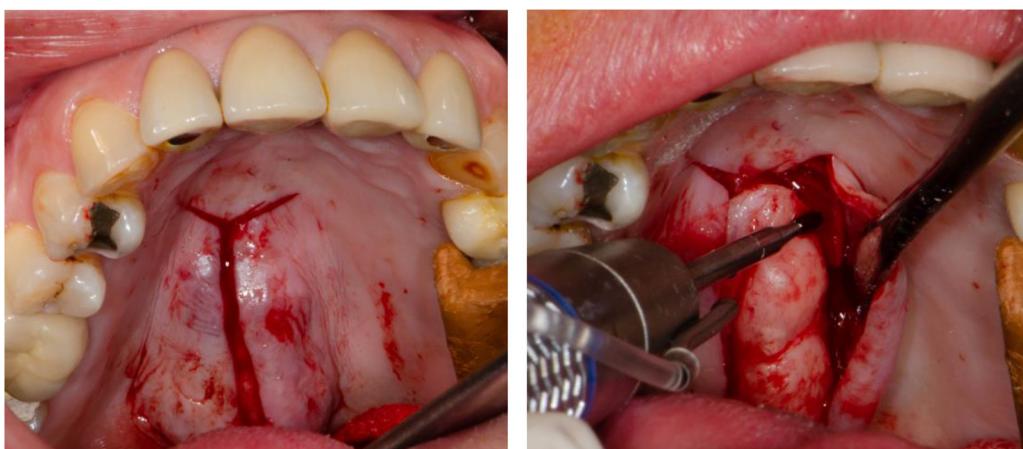


Fig. 3. Bone and mucosal surgical phase (patient T). (a) Double Y cold-knife incision. (b) Initiation of the bone cleavage plane with the fissure bur on the hand-piece.

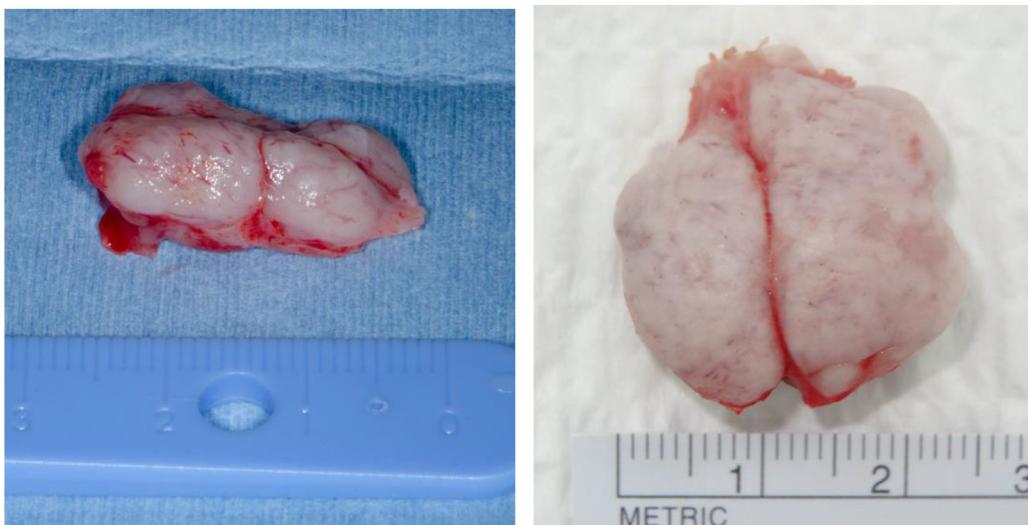


Fig. 4. Palatal tori cleaved into one operative specimen. (a) Patient T. (b) Patient V.

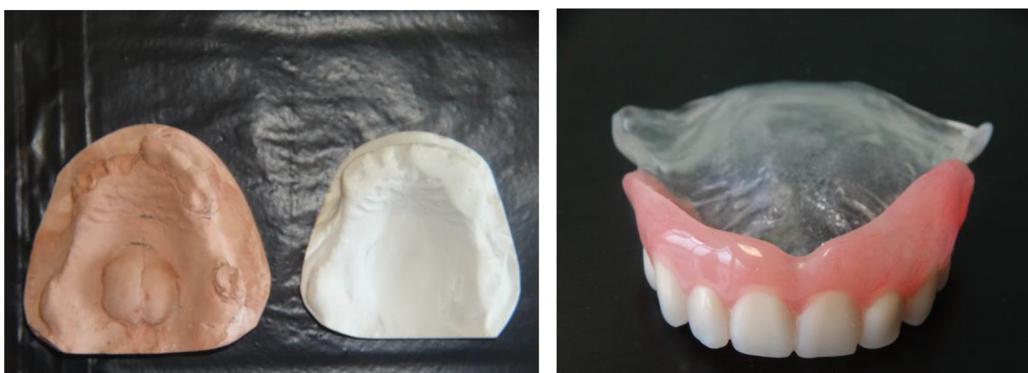


Fig. 5. (a) Initial study model (left) and after simulation of surgical resection with dental avulsions (right). (b) Immediate transient maxillary completely removable prosthesis.



Fig. 6. One-month postoperative control. (a) Patient T. (b) Patient V.

The anatomo-pathological examination of the bone specimens revealed regular bone lamellae, interlamellar spaces with adipose tissue, and vascular structures without signs of malignancy.

The patients were seen again after 15 days and 1 month postoperatively, and both presented with no complications in follow up and good mucosal healing without any apparent recurrence (**Fig. 6**).

Discussion

A literature review was performed in different databases using the keywords palatal torus, diagnosis, and management.

Epidemiology

Palatal tori are the most common oral exostoses, more common than mandibular tori. The average prevalence of palatal tori seems to be 20–40% with significant topographical disparities. Most authors have observed a predominance of palatal tori in women as well as a larger average size [1–4].

Although it may be present in children, some studies have reported the appearance and growth of palatal tori to occur in people aged 10–30 years, with a subsequent decline. Others believe that tori growth may continue beyond the age of 30 years, in the age group 40–60 years, with a variable incidence peak, depending on the population [3,5,6].

Etiological hypotheses

The exact etiology of tori has not been clearly established. Genetic theory attributes a preponderant role to certain genetic factors in the occurrence of palatal tori. On the contrary, several authors have cited that environmental factors are likely to promote oral exostoses. Although not clearly identified, masticatory hyperactivity and para-functions appear to be the main factors, with diet (unsaturated fatty acids and calcium) to a lesser extent [1,4,7].

However, the etiology of palatal tori is very likely multifactorial in nature. It now seems well established that oral exostoses results from the combined effects of genetic and environmental factors, although the proportion of each remains to be defined [1].

Clinical and paraclinical diagnosis

Palatal tori are mostly asymptomatic, which is why they usually go unnoticed, and characterized by a fortuitous discovery during a routine examination by the practitioner or by the patients themselves. The diagnosis of palatal torus is clinical, but radiographic and pathological examinations may sometimes be useful [1,2].

They occur as median and symmetrical hard palatal tumefactions located along the longitudinal ridge of the hard palate. They can be flat, nodular, fusiform, or lobular in shape. The flat shape is the most common with a symmetrical distribution and a smooth appearance. They are most often covered with a mucosa that appears normal, thin, and hypovascularized, which induces sensitivity during trauma, often causing ulceration or inflammation [1,2,8,9].

Although visible on an orthopantomogram, computed tomography scans are the ideal choice to confirm the diagnosis of palatal torus and to determine its characteristics. They appear as hyperdense, symmetrical, oblong, median masses

that lift the palatal mucosa with a density similar to that of compact bone. Large palatal tori may have a spongy bone core [1,10].

Management

Palatal tori are benign maxillary bone tumors that are most often asymptomatic and do not require any specific management. However, surgical management may be necessary in case of prosthetic instability or pre-prosthetic surgery. The presence of palatal tori may compromise the quality of removable prosthetic rehabilitation or even make it impossible by depriving the latter of a fundamental support area for prosthetic stability and sustention. Surgical excision may also be proposed in a traumatic context (erosion/mucous ulceration during chewing), hygienic issue (accumulation of food debris), psychological conditions (carcinophobia), pre-implant development (autogenous bone collection site), functional disorders (chewing, swallowing, phonation, etc.), and/or therapeutic complications (spontaneous bone exposure, osteochemonecrosis secondary to treatment with bisphosphonates).

When management is indicated for palatal tori, it is only surgical, the goal being to restore the physiology of the orofacial functions and/or to allow the realization of prosthetic rehabilitation without associated harmful compromise.

Local anesthesia is indicated in most cases, with large palatal and nasopalatal nerve blocks allowing complete analgesia in the intervention area. However, in cases of large palatal tori or a very posterior localization, general anesthesia may be considered [1–12].

The procedure has two essential phases: mucosal phase and bone phase. Four main types of incisions can be made depending on the location and morphology of the palatal torus: simple linear incision, Y incision, double Y incision, and double curvilinear incision with a long anteroposterior axis delimiting an elliptical mucosal surface that will need to be excised [1].

At the time of mucoperiosteal detachment, there is a risk of tearing of the adherent palatal mucosa and damage to the large palatal vessels, most often located at the borders of the palatal torus.

The cleavage of the bony torus can be accomplished using rotating instruments, followed by curved bone scissors. Alternatively, piezosurgery can be performed by continuously monitoring the direction of the cleavage plane to prevent any traumatic oral–nasal communication or radiating fractures. Large palatal tori may fragment before removal. After cleavage, bone regularization is performed [1,13,14].

Before closing the mucosal tissue, it is essential to ensure that the mucous membrane has correctly adapted to the new palatal environment and to perform a mucosal resection if it was not performed or if it was insufficient during the incisions at the beginning of the procedure.

A preoperatively prepared resin palatal plate or a removable prosthesis in cases of partial or total tooth loss can be put in place at the end of the procedure to provide local compression; this would prevent postoperative hemorrhaging, protect the

mucosal wound, and decrease postoperative sensitivities. According to some authors, this may reduce the risk of recurrence. Similarly, a surgical resection guide can be performed, thereby reducing the risk of under-correction or over-correction with the proximity of peripheral anatomical structures [1,11].

Conclusion

Maxillary palatal tori are benign bone tumors that may be the reason for a number of consultations. It is easy to diagnose in its classic form. However, the differential diagnosis must be made with primary or secondary malignant tumors. If it is asymptomatic, abstention is appropriate, but the general practitioner must not hesitate to refer the patient if the maxillary torus causes functional or prosthetic discomfort.

Conflict of interests: The authors declare that they have no conflicts of interest in relation to this article.

References

1. Tamba B, Dia Tine S, Barry BCG, Kounta A, Niang PD, Ba A, *et al.* Exostoses buccales: revue de la littérature. *Med Buccale Chir Buccale* 2012;18:129–141.
2. Hascoet E, Vaillant PY, Tempescul A, Darbin C, Lansonneur C, Boisramé S. Tori et exostoses multiples: présentation d'un cas et revue de la littérature. *Med Buccale Chir Buccale* 2015;21:19–24.
3. Jalinkittivong A, Langlais RP. Buccal and palatal exostoses: prevalence and concurrence with tori. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2000;90(1):48–53.
4. Al Quran FAM, Al-Dwairi ZN. Torus palatinus and torus mandibularis in edentulous patients. *J Contemp Dent Pract* 2006;7:112–119.
5. Sonnier KE, Horning GM, Cohen ME. Palatal tubercles, palatal tori, and mandibular tori: prevalence and anatomical features in a U.S. population. *J Periodontol*. 1999;70:329–336.
6. Kolas S, Halperin V, Jefferis K, Huddleston S, Robinson HB. The occurrence of torus palatinus and torus mandibularis in 2,478 dental patients. *Oral Surg Oral Med Oral Pathol*. 1953;6:1134–1141.
7. Kerdporn D, Sirirungrojying S. A clinical study of oral tori in southern Thailand: prevalence and the relation to parafunctional activity. *Eur J Oral Sci*. 1999;107:9–13.
8. Hiss J, Taddei C, Wolfram-Gabel R, Féki A. Le torus palatin. Etude réalisée sur 723 crânes humains et comparaison avec les données de la littérature. *Médecine Buccale Chirurgie Buccale* 2005;11:205–213.
9. Jainkittivong A, Apinhasmit W, Swasdison S. Prevalence and clinical characteristics of oral tori in 1,520 Chulalongkorn University Dental School patients. *Surg Radiol Anat* 2007;29:125–131.
10. El Achkar VNR, Lopes SLP de C, Pinto ASB, do Prado RF, Kaminagakura E. Imaging aspects of palatal torus in cone beam computed tomography and magnetic resonance: case report. *Acta Stomatol Croat* 2016;50:359–364.
11. Regragui A, Sefrioui A, Merzouk N, Berrada S. Hypertrophie osseuse buccale chez l'édenté complet: une fatalité à contourner! *Actualités Odonto-Stomatologiques*. 2016;275:2.
12. García-García AS, Martínez-González J-M, Gómez-Font R, Soto-Rivideneira A, Oviedo-Roldán L. Current status of the torus palatinus and torus mandibularis. *Med Oral Patol Oral Cir Bucal* 2010;15:e353–e360.
13. Princ G, Toledo R, Dichamp J. Chirurgie préprothétique. *Encyclopédie Médico-Chirurgicale Chirurgie orale et maxillo-faciale*. Paris: Elsevier, 1999:22-320-A-10.
14. Fragiskos FD. *Torus palatinus*. *Oral Surgery*. Springer Science +Business Media, 2007:253–256.