

# TORUS PALATINUS: CLINICAL ASPECT AND THERAPEUTIC STRATEGY

## TORUS PALATINUS: КЛИНИЧКИ АСПЕКТИ И ТЕРАПЕВТСКА СТРАТЕГИЈА

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### Abstract

Torus palatinus is an exostosis of the hard palate located along the median palatine suture. With slow growth and usually asymptomatic, torus is usually diagnosed by accident. Surgical treatment is necessary when it presents an obstacle for prosthetic stabilization. This article presents clinical and therapeutical aspects of torus palatinus. The clinical manifestation of palatal torus was oval in shape with longer sagittal projection and normal gingival appearance. The surgical approach depended on its size and morphology. Local infiltrative anesthesia was used. After palatal Y incision and mobilization, the torus was sectioned in smaller fractions and removed. The rough bone surface was remodeled, and the primary closure was reached with simple sutures. The sutures were removed seven days after the procedure showing signs of wound dehiscence. The wound healing was postponed and follow ups were scheduled to facilitate the healing by secondary intention. **Key words:** torus palatinus, surgical removal, prosthetic stabilization

### Апстракт

Torus palatinus претставува екзостоза на тврдото непце која е поставена долж sutura mediana. Поради својот бавен раст и отсуство на тегоби, многу често случајно се открива. Хируршка терапија е потребна кога торусот ја попречува стабилизацијата на протезата. Во овој труд се презентирани клинички и терапевтски аспекти на torus palatinus. Клинички палатиналниот торус се манифестираше со овална форма, подолга сагитална димензија и пингива со нормален изглед. Хируршкиот приод зависеше од неговата големина и морфологија. Операцијата беше изведена со локална инфилтративна анестезија. Хируршкиот приод беше овозможен со палатинална Y инцизија, а торусот беше поделен на помали делови и отстранет. Нерамната коскена површина беше замазнета и оперативното поле затворено per primam со поединечни сутури. Сутурите беа отстранети по седум дена со видливи знаци на дехисценција на раната. Поради одложување на заздравувањето, беа предвидени повеќе контроли за да се олесни заздравувањето по секундарен пат. **Клучни зборови:** torus palatinus, хируршко отстранување, стабилизација на протеза

### Introduction

Torus palatinus may be defined as an exostosis of the hard palate located along the median palatine suture, involving both the processus palatini and the os palatinum<sup>1</sup>. Hitherto no exact etiology has been identified for the presence of tori. The most widely accepted theory today is that this condition has a multifactorial etiology, which includes mainly genetics and environmental factors. According to the shape, torus palatinus can be classified as flat, spindle-shaped, nodular, and lobular<sup>2</sup>. The size is highly variable, varying from that of a small pea to an enormous enlargement that may cover the entire palate to the extent of occlusal plane. Reichart et al have classified TP, based on their size, as small (less than 3 mm), medium (3–6 mm), and large (more than 6 mm) tori<sup>3</sup>. It is composed of a dense cortical bony structure and minimal amount of bone marrow covered with a

fragile and limited vascularized mucosa. Larger specimens can have a center of cancellous bone and the only difference between the palatal torus and other exostoses is in its being developed at characteristic sites and in a symmetrical manner<sup>4</sup>. Diagnosis is frequently in occasional way because those pathologies are asymptomatic<sup>5</sup>. Palatal tori are characterized by slow growth and the torus can reach a large size that requires surgical removal, for example, when representing an obstacle to prosthetic treatment<sup>6,4</sup>.

This article presents clinical and therapeutical aspects of torus palatinus.

### Aim of the paper

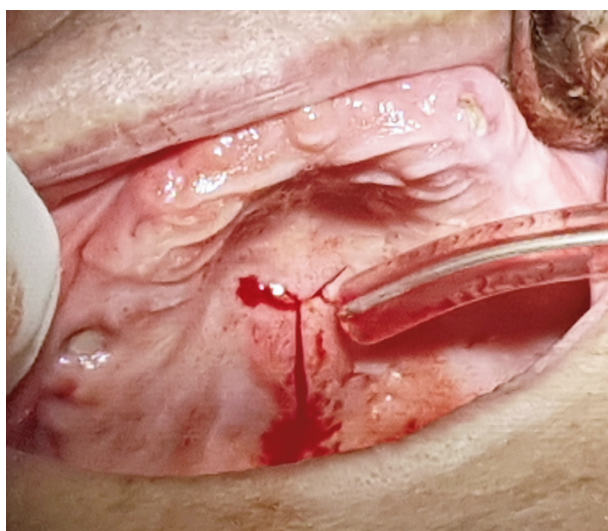
A 72 years old female was referred to the University department of oral surgery for pre prosthetic teeth removal. During anamnesis, the patient confirmed to be

diabetic and hypertensive. Clinically, gangrenous teeth in the maxilla and a prominence in the midline of the hard palate were visible. The oval shaped prominence had longer sagittal projection and normal gingival appearance (figure 1).



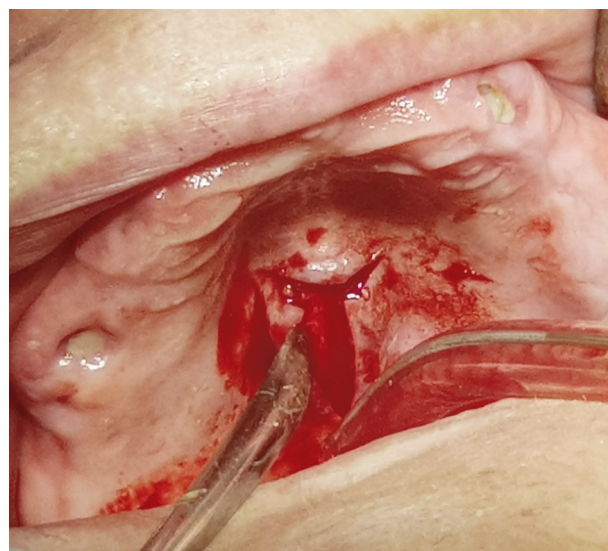
**Figure 1.** Clinical appearance of torus palatinus. Note the mid palate oval symmetrical protuberance, with longer sagittal projection and normal gingival appearance

It was firm and painless on palpation. Hence a diagnosis of torus palatinus was made. The patient was not aware and she didn't have any complaints or issues with the palatal protuberant. But in order to achieve prosthetic stabilization, it was obvious that torus palatinus had to be removed. The surgical removal was performed with



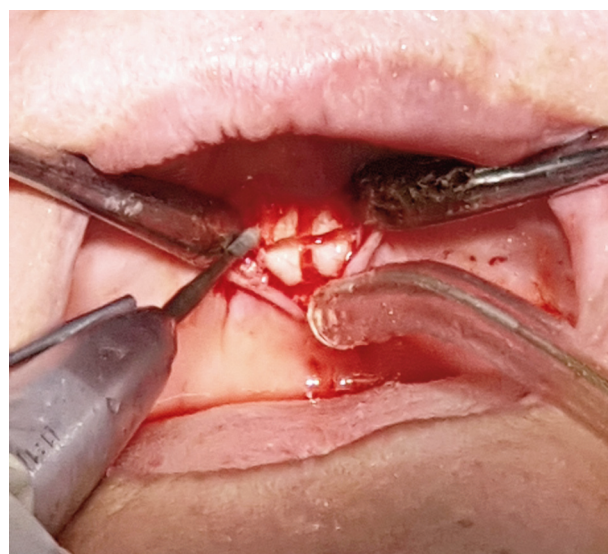
**Figure 2.** Y midpalate incision

local infiltrative anesthesia (3% mepivacaine, Scandonest). Bilateral terminal anesthesia was administered in premolar and molar region on vestibular as well as palatal side. Sagittal Y incision was positioned across the mid palate using scalpel No.15. (figure 2). Subsequently, mucosal tissue and the underlying periosteum were detached in order to expose the subjacent lesion to the largest possible extent (figure 3).



**Figure 3.** Mobilized Y incision

The surgical technique itself was based on the sectioning of the torus in smaller fractions and their removal. At first a sagittal groove with a fissure bur and a straight hand



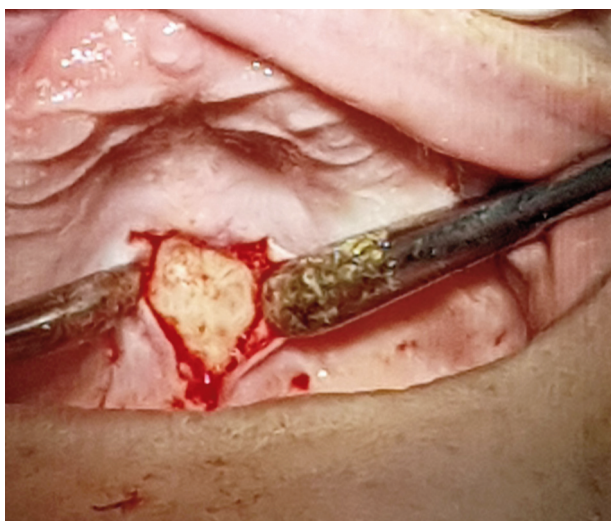
**Figure 4.** Four squares outlined with sagittal and transverse grooves



piece was made under abundant irrigation with 0.9% saline solution followed by transversal, thus four squares were outlined (figure 4).



**Figure 5.**



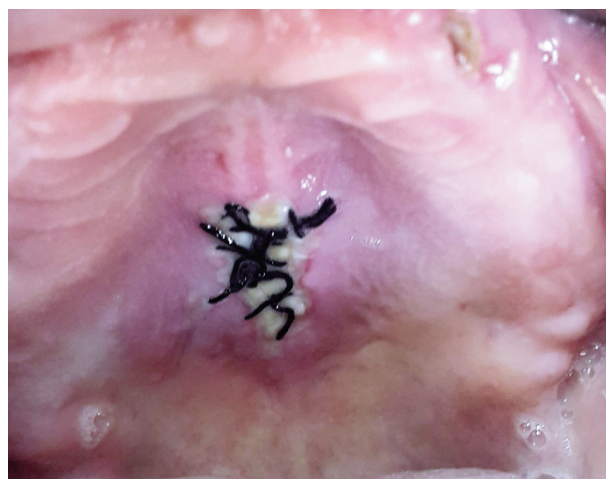
**Figure 6.**

**Figure 5, 6** Remolding of the bone surface

Primary closure of the surgical bed was reached with simple sutures, tension free (figure 7). In the immediate postoperative period analgesic therapy was advised and the patient was advised to consume only cold liquids. At the first follow up palatal edema was evident (figure 8). The sutures were removed seven days after the procedure with visible wound dehiscence (figure 9). The wound healing was postponed and follow ups were scheduled to facilitate the healing by secondary intention (figure 10).



**Figure 7.** Surgical wound sutured, tension free



**Figure 8.** First postoperative follow up. Note the palatal edema



**Figure 9.** Wound dehiscence after suture removal



**Figure 10.** Wound healing by secondary intention

## Discussion

According to the literature, 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<sup>7-10</sup>. Epidemiological data differs. Some studies have reported the appearance and growth to occur in people aged 10–30 years, with a subsequent decline. Others believe that tori growth may continue beyond the age of 30, in the 40–60 age group, with a variable incidence peak, depending on the population<sup>9,11</sup> as was the case with the 72-year female patient. 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. 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<sup>7,10,12</sup>. Torus palatinus has been described as an anatomical variation rather than a pathological condition, which more frequently affects the female gender and young population<sup>13,14</sup>. Palatal tori are mostly asymptomatic as was demonstrated in this case, which is why they usually go unnoticed, and characterized by a fortuitous discovery during a routine examination by the practitioner as presented in this case. The diagnosis of palatal torus is clinical, but radiographic and pathological examinations may sometimes be useful<sup>7,8</sup>. For correct clinical diagnosis it is important to remember that torus palatinus is always symmetrical and located in the middle of the hard palate. Asymmetrical formations

must be differentially diagnosed as other benign or malignant lesions. If a suspected torus is not midline a biopsy is needed to rule out this potentially fatal adenoid cystic carcinoma<sup>15</sup>. A diverse morphological variation can be seen such as flat, nodular, lobular and spindle shaped, the prevalence of which depend on the epidemiological profile of each population<sup>16</sup>. The size of the tori may fluctuate throughout life and, when they interfere with function or partial/full denture placement, surgery is a necessity<sup>17,18</sup>. The torus palatinus reported in this case was medium sized, spindle shaped with wide base, located in the middle palate of edentulous maxilla. Palatal tori are benign maxillary bone tumors that are most often asymptomatic, slow growing and do not require any specific management. However, surgical management may be necessary in case of prosthetic instability or pre-prosthetic surgery<sup>19</sup>. 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<sup>7-24</sup>. Various techniques have been used in the conventional surgical treatment of these lesions<sup>25,26,27,17,18,28,29</sup>, since the technique will depend on the extent and location of the lesion, and the epidemiological profile of the patient. Conventional surgical treatment, in exception of chisel and hammers that involve possible risks of traumatic injuries, request to perform excision via bony burs once the flap has been anchored by different methodologies or simply elevated and maintained via suture needle or any other conventional means. 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 antero posterior axis delimiting an elliptical mucosal surface that will need to be excised<sup>7</sup>. In the presented case a Y incision was used to enable anterior flap mobilization. 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<sup>19</sup>. The palatal mucosa was thin, and submucosa was obscured, rigid, so flap mobilization was delicate, but not compromised. The surgery of torus palatinus reported in this case could be done in the few manners: torus removal by slicing or cutting with burs or pyzosurgery, wearing away the torus with surgical burs, pyezo or peeling/smoothing with Er:YAG laser. The cleavage of the bony torus can be accomplished using rotating instruments, followed by curved bone scissors. Alternatively, piezo surgery 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<sup>7,30,31</sup>. The shape and the extent of torus influenced the treatment plan. Its spindle shape covered the anterior region of the palatal vault without extension to the alveolar process, thus torus was removed by sectioning. 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 has not been performed or if it was insufficient during the incisions at the beginning of the procedure<sup>19</sup> which was not the case. The suturing was delicate, and a steady hand was required to not tear the gingiva while suturing. The per primam wound healing was disrupted as in a reported case of removal of giantiforme torus palatines, with sutures being removed 15 days post op<sup>32</sup>. It is the author's opinion that due the postoperative edema the wound dehiscence became apparent. 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<sup>7,23</sup>. A palatal plate could restrain postoperative swelling and prevent wound dehiscence, so it is advisable to use it in palatal torus surgery.

## Conclusion

Torus palatinus is an asymptomatic bone formation that has to be surgically removed as a prerequisite for prosthetic stabilization. The surgical approach depends on its size and morphology. Asymmetrical palatal formations must be differentially diagnosed from palatal torus as other benign or malignant lesions.

## Reference

1. Sisman Y, Ertas ET, Gokce C, Akgunlu F. Prevalence of torus palatinus in Cappadocia region population of Turkey. *Eur J Dent*. 2008;2:269–275.
2. Simunković SK, Bozić M, Alajbeg IZ, Dulčić N, Boras VV. Prevalence of torus palatinus and torus mandibularis in the Split-Dalmatian County, Croatia. *Coll Antropol*. 2011;35:637–641.
3. Reichart PA, Neuhaus F, Sookasem M. Prevalence of torus palatinus and torus mandibularis in Germans and Thais. *Commun Dent Oral Epidemiol*. 1988;16:61–64.
4. Cawson RA, Odell EW – editors. *Cawson's essentials of oral pathology and oral medicine*. London: Churchill Livingstone; 2008.
5. J. P. Rocca, H. Raybaud, E. Merigo, P. Vescovi, C. Fornaini. Er:YAG Laser: A New Technical Approach to Remove Torus Palatinus and Torus Mandibularis. *Case Rep Dent*. 2012, 1-4.
6. Gorsky M, Raviv M, Kfir E, Moskona D. Prevalence of torus palatinus in a population of young and adult Israelis. *Arch Oral Biol*. 1996. Jun;41(6):623–5.
7. 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.
8. 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.
9. Jankittivong 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.
10. Al Quran FAM, Al-Dwairi ZN. Torus palatinus and torus mandibularis in edentulous patients. *J Contemp Dent Pract* 2006;7:112–119.
11. 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.
12. Kerdpon 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.
13. Telang L.A, Telang A., Nerali J., Pradeep P. Tori in a Malaysian population: morphological and ethnic variations. *J. Forensic Dent. Sci*. 2019;11:107.
14. Pei-Ching C. Torus palatinus in Taiwan patients receiving peritoneal dialysis and hemodialysis: a prospective observational study. *J. Multidiscip. Healthc*. 2020;13:373.
15. R P. Usatine, M A. Smith, H S. Chumley, E.J. Mayeaux Jr. *A color atlas of family medicine*. Second edition: [www.accessmedicine.com](http://www.accessmedicine.com)
16. MacInnis E.L., Hardie J., Baig M., Al-Sanea R. A Gigantiform torus palatinus: review of the literature and report of a case. *Int. Dent. J*. 1998;48:40–43.
17. Seah YH. Torus palatinus and torus mandibularis: a review of the literature. *Australian dental journal*. 1995;40(5):318–321.
18. Bruce I, Ndanu TA, Addo ME. Epidemiological aspects of oral tori in a Ghanaian community. *International Dental Journal*. 2004;54(2):78–82.
19. J Bouchet, G Hervé, G Lescaille, V Descroix, A

- Guyon. Palatal torus: etiology, clinical aspect, and therapeutic strategy. Up-to Date Review And Case Report. *J. Oral Med Oral Surg* 2019;18-25
20. 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.
  - 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.
  21. 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.
  22. 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.
  23. 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.
  24. García-García AS, Martínez-González J-M, Gómez-Font R, Soto-Rivadeneira A, Oviedo-Roldán L. Current status of the torus palatinus and torus mandibularis. *Med Oral Patol Oral Cir Bucal* 2010;15:e353–e360.
  25. Garcia-Garcia AS, Martinez-Gonzalez JM, Gomez-Font R, Soto-Rivadeneira A, Oviedo-Roldan L. Current status of the torus palatinus and torus mandibularis. *Medicina Oral, Patologia Oral y Cirugia Bucal*. 2010;15(2):e353–e360.
  26. Antoniadis DZ, Belazi M, Papanayiotou P. Concurrence of torus palatinus with palatal and buccal exostoses: case report and review of the literature. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*. 1998;85(5):552–557.
  27. Haugen LK. Palatine and mandibular tori. A morphologic study in the current Norwegian population. *Acta Odontologica Scandinavica*. 1992;50(2):65–77.
  28. Sirirungrojying S, Kerdpon D. Relationship between oral tori and temporomandibular disorders. *International Dental Journal*. 1999;49(2):101–104.
  29. Jainkittivong A, Langlais RP. Buccal and palatal exostoses: prevalence and concurrence with tori. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*. 2000;90(1):48–53.
  30. Princ G, Toledo R, Dichamp J. Chirurgie préprothétique. *Encyclopédie Médico-Chirurgicale Chirurgie orale et maxillo-faciale*. Paris: Elsevier, 1999:22-320-A-10.
  31. Fragiskos FD. Torus palatinus. *Oral Surgery*. Springer Science+Business Media, 2007:253–256.
  32. W. Bernaola-Paredes, A MPereira, T.A.Luiz, I. S Martins, F F. Lima, K. A. Vallejo-Rosero. An atypical presentation of gigantiform torus palatinus: A case report *Int J Surg Case Rep*. 2020; 75: 66–70.