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RESEARCH ARTICLE

A CLINICAL STUDY AND AN INVESTIGATION ON THE RELATION OF TORUS PALATINUS AND TORUS MANDIBULARIS WITH TMD

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ABSTRACT

Torus palatinus and torus mandibularis being non-pathological and inconspicuous most of the time serves minimal attention from patients and clinician. On controversy temporo mandibular diseases (TMD) having a variety of eitiopathology and various grades of manifestations has always been an interesting area for clinicians. Though the prevalence of tori and their correlation with sex and age had studied widely, the reduced number of samples always been a limitation. This study was under taken to find whether a correlation exists between these two entities. We conducted a wide clinical examination and study model analysis on 2500 sample of which 0.44% were presented with torus mandibularis and none with torus palatinus. Almost same frequency of occurrence was observed between males and females. For males, prevalence of tori was maximum at second decade and for females on third decade. Whereas least tori were seen in third decade for males and first decade for females. On comparison of TMD with Torus mandibularis it was found that there was no such correlation since only one case was presented with both conditions. Most of tori were found to be situated on anterior one third region and of mild form so that most of the patients were unaware about the existence.

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INTRODUCTION

Term exostosis can be described as non-pathological, localized bony protuberance that arise from the cortical bone and sometimes from the spongy layer [(1)]. Two major forms of bony exostosis which are commonly present intra oral site specifically are 1. Torus mandibularis and 2. Torus palatinus. T. Palatinus is an exophytic nodular mass of bone that arises along the midline structure of hard palate (Neville, 1995). T. Mandibularis is a similar localized bony protuberance of mandible situated lingually in the area of premolars, above mylohyoid ridge (Reichart, 1988). Since they are considered as exostosis and are having a natural occurrence they don't have pathological entity. From prosthodontics view they hinders construction and function of both upper and lower dentures (Seah, 1995). In periodontic stand point, it causes post surgical problems like delayed healing and flap approximation failures if mucoperiosteal surgery is included at the site of tori occurrence (e.g.: palatal exostosis in the molar region (Nery, 1977). Orthodontically it can create problems in construction of TPA, Nance button, lingual arch and the placement of palatal mini screws.

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Retention and stability of orthodontic removable appliances will also become questionable. From the Oral Surgical aspect, tori obscure maxillary sinus and premolars region (Seah, 1995), leading to decreased clarity and unrevealing of clinically relevant findings in that region. In severe conditions, they can even lead to difficulty in speech, deglutition, mastication and free tongue movements. Chances for ulceration of tori mucosa under denture and removable appliance due to masticatory stress is also high. Cases associated with SCC and Osteomyelitis has also been reported (Pasqual, 1968). T. Palatinus is classified as (Thoma, 1950) Flat Tori, Spindle Tori, Nodular Tori, Lobular Tori. T. Mandibularis is classified as Single Unilateral Tori, Multiple Unilateral Tori, Single Bilateral Tori, Multiple Bilateral Tori. Investigators points out two opposing views about factors causing Tori 1) Genetic factor 2) Environmental factors Genetic factor; Genes creating Tori are considered as non sex linked (Kolas, 1953) simple autosomal dominant (Gould, 1964). According to Sellevold (Sellevold, 1980) genetic factors not only affect the size but also morphology of Tori.

- Environmental factors; 1. Functional (Hooton, 1918)-compensatory adaptation for masticatory hyper function. 2. Dietary habits and nutritional disturbance (Eggen,

1991) - avitaminosis. 3. Behavioral - para functional habits. 4.Climatic factors (Kolas, 1953)

- Newer concepts: 1. Continuing growth process; horizontal forces cause root tipping and exerting pressure on PDL causing new bone formation leading to tori formation (Ossenberg, 1981). 2. Evolution; T. mandibularis is a pillar left during evolutionary reduction of jaw mass (Weidenreich, 1936). 3. TMD; patients with parafunctional activity causing TMD have chances for T. Mandibularis (Sirirungrojying, 1999). 4. Quasi continuous genetic or threshold model; A multi factorial system in which liability to environmental factors with a value above the threshold can lead to Tori formation (Eggen, 1994).

Distribution

Torus Palatinus: Gender difference prevails in the occurrence of Tori. Some authors points T. Palatinus affects males more than females (Bemaba, 1977), while most investigations found T. Palatinus have high frequency in females (Miller, 1940; Kolas, 1953; King, 1971). But some studies resulted in finding no practical differences between two groups (Chew, 1950). However, sex difference prevalence seems to be very small on skull studies, might be because of the fact that smaller Tori are common for male (Woo, 1950) which are difficult to identify in live studies. T. Palatinus have approximately 2:1sex ratio favoring females (Kolas, 1953). Also, they found to be of larger size in females (Woo, 1950; Haugen, 1992). Evidences are present to show that torus is more frequently observed in middle phase of life. The percentage of occurrence of T. Palatinus increases from first to third decade of life (Seah, 1995). On the basis of morphology, flat Tori stands first, spindle Tori second and lobular and nodular occur the least. Flat and spindle Tori together comprises of 84% of total palatine Tori (Kolas, 1953). Considering site of occurrence most of Tori were located posterior two third followed by middle one third and least on anterior one third (Chew, 1984). Checking the worldwide distribution pattern, T. Palatinus have a racial influence with highest incidence in Mongoloids (Chew, 1984) followed by Caucasian and least in Negroids (Seah, 1995).

Torus mandibularis

In contrast with T. Palatinus, T. Mandibular is found more in males than females (Karaiskos, 1989; Flynn, 1992), with an exception of some studies (Kolas, 1953). T. Mandibularis also occurs very infrequently in juvenile period, but the frequency increases by third decade, points that they are having an onset by 30 years of age (Kolas, 1953). Most frequently reported Tori is bilateral multiple followed by bilateral single which together makes 80% of total Mandibular Tori (Kolas, 1953). No significant difference was found between whites and non-whites (Kolas, 1953).

Aims and objectives: The aim of this study is to determine the incidence of T. Palatinus and T. Mandibularis in Indore, the location and appearance of Tori intra orally, finding the association of TMD with Tori if present and to compare these findings with similar studies carried out previously.

MATERIALS AND METHODS

Previous studies conducted on torus with a sample size of 2478 found to be reporting 20.9% of T. palatinus and 7.75% of sample with T. mandibularis. So, it was decided to take a sample size of two thousand five hundred patients irrespective of sex and age within 12-40 years, attending the Department of Orthodontics and Dentofacial Orthopedics, Govt. College of Dentistry, Indore will be examined for the presence of both T. Palatinus and T. Mandibularis. Patients will be divided based on 1) Age as second decade (12-20years), third decade (21-30) and fourth decade (31-40), 2) TMD as affected and normal and 3) sex as male and female. TMD patients were diagnosed by considering tmj pain, muscle pain, tmj dysfunction, mandibular deviation, opening range, chewing pattern, joint noises, clenching, frequency of headache etc. In cases of presence of Tori, irreversible hydro colloid impressions and relevant photographs will be made for the purpose of expert opinion and record, after gaining verbal consent from patients. In doubtful cases, digital palpation will be done.

Records will be made regarding age, sex, TMJ conditions and any other relevant questions related to Tori if required. Maxillary palate will be checked for any abnormal protuberances. In doubt, careful history will be collected and IOPAs will be done for discarding false protuberances due to incisor\canine impactions, periapical\periodontal infections and rotated roots. Palatal region will be divided into anterior one third, middle one third and posterior one third considering incisive papilla as anterior and fovea palatine as posterior reference points. Similarly, mandibular arch will be divided equally into right and left lingual quadrants and will be searched for T. mandibularis. The area anterior to first premolars will be considered as anterior half and behind it as posterior half.

RESULTS AND OBSERVATION

Out of 2500 patients 0.44%(11 out of 2500 sample) were presented with T. mandibularis. Whereas not a single patient was presented with T. palatinus. Out of 11 T. mandibularis patients, 5 were males and 6 were females. Practically almost same frequency of occurrence was observed between males and females. Most of the Tori were visible on anterior region bilaterally. Only two cases of unilateral (left) T. mandibularis were reported.

Table 1. Gender wise percentage of tori

	Torus madibularis	
	Male	Female
Number	5	6
Percentage	0.2%	0.24%

Table 2. Decade wise classification of tori

Decade	Number of tori	
	Male	Female
12-20	3	0
21-30	2	2
31-40	0	4

Bilateral tori multiple was most prevalent than bilateral single tori. On considering size and clinical visibility of T. Mandibularis ,3 of the tori were clinically invisible and diagnosed by palpation only, 7 were clinically visible but patients were unaware about the existence as the size was too small and only one was obscuring some of the tongue space. Table 2 shows decade wise comparison of tori detected. For males, prevalence of tori was maximum at second decade and

for females on third decade. Whereas least tori were seen in third decade for males and first decade for females. A total of 24 patients out of 2500 sample were turned out to be TMD patients.

Out of which only a single TMD patient was having T. mandibularis. Her tori were mild which was almost inconspicuous, bilateral, multiple and anteriorly placed.

Conclusion

From observation of 2500 patients attended Department of Orthodontics and Dentofacial Orthopedics, Govt. College of Dentistry, Indore, presence of T. mandibularis was found to be in11 patients with 0.2% male and 0.24% females and presence of T. Palatinus was not found in single patient. On comparison of TMD with T. mandibularis it was found that there was no such correlation since only one case was presented with both conditions. Most of tori were found to be situated on anterior one third region and of mild form so that most of the patients were unaware about the existence.

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Key Points:

- Torus palatinus
- Torus mandibularis
- Dentistry
- Oral Pathology
- Temporomandibular Joint Dysfunction

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