ANALYSIS ON LINKAGE OF SUPERNUMERARY TEETH WITH THE TYPICAL SELLA TURCICA MORPHOLOGICAL DEVIATIONS

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ABSTRACT
It is discovered that typical anatomical alternatives of the sellaturcica are related with dental abnormalities such hyperdontia or supernumerary teeth. The most prevalent normal anatomical variation that has been linked to different dental abnormalities is sellaturcica linking. This essay's goal is to investigate the relationship between additional teeth and common sellaturcica anatomical variations. The database of the Department of Oral Radiology is used to gather high-quality pre-orthodontic radiographs (panoramic radiographs and cephalographs) of both genders and between the age groups of 11 and 40 years. Cephalograms are investigated for the anatomical alternatives of sellaturcica whereas panoramic radiographs were used to determine whether or not there were any extra teeth. The study revealed that out of 845 radiographs, 40 subjects (4.73%) were present with single unilateral supernumerary teeth.Chi-square test revealed aimportantsuggestionamong the occurrence of supernumerary teeth and anatomical variant of sellaturcica ($p = 0.003$*). The study determined that the different variants of sellaturcica along with sellar bridging should be taken into consideration while predicting dental anomalies in a subject while evaluating acephalograph.

KEYWORDS: Anatomical variant, dental anomalies, sellaturcica, supernumerary teeth.

INTRODUCTION

In the course of their daily work, dentists come across a variety of dental irregularities. These dental anomalies can be broadly divided based upon their shape, size, number, position and eruption. The aberration of the teeth connected to the number is called hypodontia, or supernumerary teeth. It only suggests the existence of a tooth or teeth in addition to those seen in the regular dentition. In various groups, the prevalence of effusive teeth varies between 0.5 and 5.3% for permanent dentition and between 0.2 and 0.8% for essential dentition. Also, it has been found that this dental deformity is linked to a number of diseases, including Gardner's disorder, Ehlers-Danlos disorder, and Fabry-Anderson syndrome1.

Dental inconsistencies like exaggerated teeth or hypodontia are discovered to be related with the ordinary anatomical variations of the sellaturcica. Sellaturcica is a seat formed concavity which is available on the intra-cranial exterior of more prominent sphenoid bone and acts a home for the pituitary organ. This structure comprises of tuberculumsellae, floor, and dorsum sellae. The anatomical variations of sellaturcica can be arranged into angled front divider, twofold form of the floor, abnormality (scoring) in the back piece of the dorsum sellae, pyramidal state of the dorsum sella ST bridging, hypertrophic back clinoid measure, hypo trophic back clinoid cycle, and diagonal figure of the floor. Sellaturcica crossing over is the most widely recognized typical anatomical variation which are discovered to be related with different dentofacial anomalies2.

The point of this paper was to consider the relationship of the effusive teeth with the ordinary anatomical variations of the sella turcica3.

Cephalometric movies and drawings are primarily utilized by assessment of emaciated and dental examples as a reason for anticipating facial growth4. In any case, moreover, they comprise added symptomatic data regarding the skull, face, and upper cervical spine. Numerous examinations have portrayed skeletal irregularities and typical variations on cephalometric radiographs and a portion of this is managed the calcification of the interlined tendon (ICL) of the sellaturcica (Bisk and Lee, 1976; Kantor and Norton, 1987; Tetradis and Kantor, 1999).

In solid topics, the event of sella connecting goes after 3.8 to 13 percent.

An away from towards a more noteworthy recurrence of sellaturcica connect is depicted in affected personsby serious craniofacial deviations. In that review, 177 sidelong cephalometric radiographs are checked on and a sellaturcica connect is seen in 18.6 percent of topics. In affected personspreserved by consolidated careful orthodontics, the rate

of connecting was accounted for to be 16.7 percent, yet just 7.3 percent in the gathering treated orthodontically5 be that as it may, all the more every now and again, a changed morphology of the sellaturcica is by all accounts brought about by innate distortions. Truth be told, sella crossing over has been accounted for as a radiographic component of basal cell carcinoma (Gorlin–Goltz) condition, alongside calcification of the falx cerebri6.

A modifiedsellaturcica morphology, or spanning of the sella, is additionally current in certain affected personsby different issues and disorder. In thistopics, the adjusted construction of the sellaturcicais identified with the syndrome7.

Arrangement and advancement of the sellaturcica and teeth share, in like manner, the inclusion of neural peak cells8. Truth be told, the foremost piece of the sellaturcica is accepted to grow essentially since neural peak cells, and dental epithelial ancestor cells separate concluded successive and proportional cooperation by neural peak determined mesenchyme9. Despite this formative relationship, no precise examination has been embraced to look at the occurrence of any relationship among a sellaturcica extension and dental inconsistencies. The main past investigation was restricted to portraying the pervasiveness of dental inconsistencies and skull calcification and ordinary variations realized on cephalometric radiographs deprived of introducing any connections among them[10].

MATERIALS ANDMETHODS

A good quality pre-orthodontic radiographs (panoramic radiographs and cephalongraphs) of both gender and between the age group of 11-40 years are collected from thedatabase of the Department of Oral Radiology. All the cephalongraphic radiographs with poor prominence of sellaturcica on cephalogram or cephalograms of the patient with craniofacial anomaly or syndrome, and history of trauma were excluded from the study. Panoramic radiographs with more than one supernumerary tooth were also excluded from the study. A total of 845 radiographs met the inclusion and exclusion criteria[11]. These panoramic radiographs were analyzed for the presence of supernumerary teeth. The subjects with supernumerary tooth were taken as cases and rest of the subjectswithoutsupernumerary teeth were considered as control for the study. The presence of normal and anatomical variants of sellaturcica was next assessed on cephalographic radiographs of both case and control patients. Oblique anterior wall, double contour of the floor, irregularity (notching) in the posterior part of the dorsum sellae, pyramidal shape of the dorsum sella, sellar linking (type A, type B, partial), hypertrophic posterior clinoid procedure, hypotrophic posterior clinoid procedure, and oblique contour of the floor were among the anatomical variants studied.Descriptive analysis was done to assess the frequency of different shapes of sellaturcica in case and control subjects. Chi- square test is completed to discovery the suggestion between supernumerary tooth and anatomical variants of sellaturcica[12].

State of the sellaturcica

The works account for various stages of the sellaturcica. 35–38 Gordon and Bell35 classified the sellaturcica as round, oval, straightened, or saucer moulded, with the majority of themes having a round or oval-shaped sellaturcica. Different arrangements depend on the shapes of the sellafloor; the points framed forms of the foremost and back clinoid measures and the tuberculumsellae, and the combination of mutuallyclinoid measures as a sellaturcica bridge13. The state of the sellaturcicahooked on six principle types: ordinary sellaturcica, diagonal front divider, twofold molded sella, sellaturcica connect, inconsistency (scoring) in the back piece of the sella, and pyramidal state of the dorsum sellae (Figure 2). An adjustment looking like the sellaturcica can be tricky in light of the fact that it could be available in "typical" subjects just as in medicinally undermined subjects, for example, individualsby craniofacial eccentricity and spina bifida14.

In the present examination, 56.4% of topics seemed to be an ordinary molded sellaturcica, though 43.6% gave various abnormalities. The recurrence of typical morphology of the sellaturcica in the current examination is marginally lower by the rates announced through different investigations. The figure and extent of the sellaturcica in affected personsbyemaciatedIn 67 percent of cases, Class I, Class II, and Class III connections form and establish a typical morphology of the sellaturcica. The remaining 33% produced different morphologies of sellaturcica. In an investigation directed by Mahmood et al,29 the ordinary geomorphologyisrealized in ~66% of topics, and varieties are available in 34% of subjects[15].

RESULTS

The study revealed that out of 845 radiographs, 40 subjects (4.73%) were present with single unilateral supernumerary teeth. Equal gender predilection (Male: 20; female: 20)werefound for the prevalence of supernumerary teeth. The prevalence of different shapes of sellaturcica namely normal, type A bridge, type B bridge, partial bridge, hypertrophic clinoid process, hypotrophicclinoid process, notched clinoid process, pyramidal, double contour of the floor, oblique

contour of floor, and oblique anterior wall between the subjects without supernumerary teeth was336,57,34,187,27,2,80,28,19,15,and20.

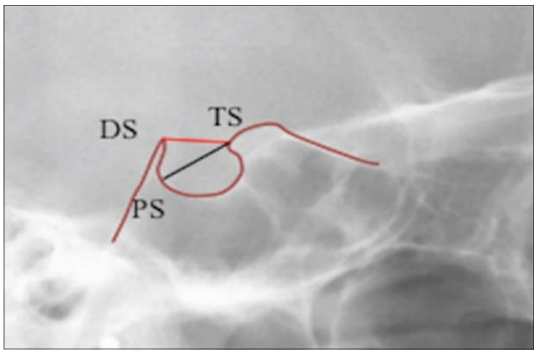

Figure 1: Tracing of sellaturcica contour

The occurrence of different shapes of sellaturcica namely normal, type A bridge, type B bridge, partial bridge, hypertrophic clinoid process, hypotrophicclinoid process, notched clinoid process, pyramidal, double contour of the floor, oblique contour of floor, and oblique anterior wall between the subjects with supernumerary teeth was 12, 2, 1, 12, 4, 2, 3, 2, 1, 0, and 1. The frequency of the different shapes of sellaturcica in the subjects with and without supernumerary teeth is exposed in Table 1. Chi-square test revealed aimportantsuggestionamong the occurrence of supernumerary teeth and anatomical variant of sellaturcica (p = 0.003*).

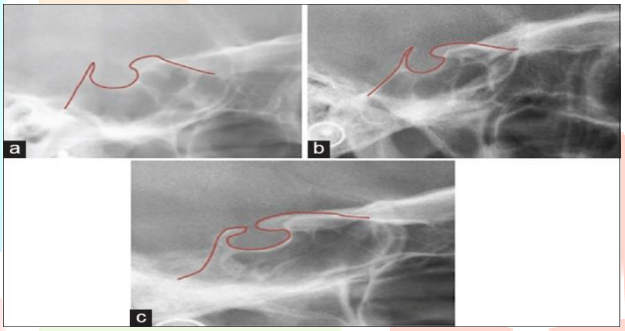

Figure 2: (a) Type I sellaturcica bridging. (b) Type II sellaturcica bridging. (c) Type III sellaturcica bridging

Table 1: Occurrence of the dissimilarforms of sellaturcica in the subjects with and deprived of supernumerary teeth

Supernumerary teeth	Shape											Total	p value
	Bridging												
	Normal	Type A bridge	Type B bridge	Partial bridge	Hypertrophic	Hypotrophic	Notching	Pyramidal	Double contour of floor	Oblique anterior wall	contour of floor		
Absent	336	57	34	187	27	2	80	28	19	15	20	805	
Present	12	2	1	12	4	2	3	2	1	0	1	40	
Total	348	59	35	199	31	4	83	30	20	15	21	845	0.003*

Figure 3: Come beam CT

DISCUSSION

Embryologically, sellaturcica serves as the key area bypassage of the cranial neural crestal cells. These pluripotent cells will migrate into different craniofacial development fields. These cells will undergo sequential and reciprocal in these fields to form number of differentiated cells. These cells are responsible for the formation of two important facial primordia namely, frontonasal procedure and first branchial arch; that will develop into the proximal maxilla and mandible[16].These primordial structure are the location for the development of the teeth. These teeth are formed from stomodeal ectoderm and cranial neural crestalmesenchymal cells. Coordinated expression of these two cells causes initiation of tooth formation, shaping of the tooth and cyto differentiation. Hence, it can be concluded that the cranial neural crestal cells which are responsible for the formation of both sellaturcica and teeth or in other words, any malformation/deviation in the morphology of ST can be reflected as the dental anomaly related to shape, size, number or position.

During embryological development, the neural crest cells migrate to the frontonasal and maxillary developing fields. The calcifications of the ICL may be associated to the dental anomalies as they share the common embryological developmental pathway. This anatomical variation of the sellaturcicamightreplicate the developing pathological conditions of the oral cavity which may alert the clinician in predicting the susceptibility to dental anomalies.

In the currenteffort, we annoyed to investigate the sella bridging in both maxillary (30 participants) and mandibular impacted canines (9 subjects) and supernumerary teeth (23 participants). It has been the primarylearning to investigate the occurrence of sellaturcicalinking in affected personsby dental irregularities among the Indian population[17].

Till now, researchers focused their attention mainly on sella bridging in malposed maxillary canines be it palatally displaced or impacted canines, highly placed canines, combination of buccal and palatal canine impactions. However, there are only a few studies reported on the combination of dental anomalies such as palatally displaced canines and lost mandibular second premolar, transposition. Until now, the only study that analyzed the occurrence of a STB in relation to various dental anomalies such as palatially and vestibular obstructed canines, upper lateral incisors, and lower second premolar agenesia, and hyperdontia.

It isconfirmed that the occurrence of incomplete and complete bridging is meaningfullyamplified in affected personsby dental anomalies versus controller group which are reliableby the rare previous reports.

This study is inadequate by few factors. Lateral cephalograms were used in the study which is a two-dimensional representation of a three-dimensional object and has its own errors such as landmarks identification and tracings errors. Therefore, cone-beam computed tomography, a three-dimensional imaging, could give more precise representation. However, such imaginationmethods in orthodontic affected persons are not specifiedunpaid to the advancedexperience to radiation for routine use. A higher sample size inclusion with different dental anomalies would yield more significant results.

'Bridging' is the most commonly studied anatomical variant of the sellaturcica and is found to be linkedby the congenitally lost upper lateral incisors and lower second premolars, palatially displaced canine, maxillary maltose canine, dental transposition or supernumerary teeth. To the best of our knowledge no studies are done to associate the presence ofsupernumeraryteeth with other anatomical alternatives of sellaturcica. The reason might being the lower prevalence rate of the other anatomical variants of sellaturcica.

Our learningexhibited that the most common anatomical variant of sellaturcicainitiated to be meaningfully associated with the supernumerary tooth was partial bridging. The other anatomical variants found to be associated with this dental anomaly was type A bridge, type B bridge, partial bridge, hypertrophic clinoid process, hypotrophicclinoid process, notched clinoid process, pyramidal, double contour of the floor, and oblique contour of floor however; their prevalence rate was quitelow.

CONCLUSION

Sellaturcica connection (STB), or calcification of the sellaturcica's interlined tendon, is a cause of several dental abnormalities (palatal canine impaction and rendering). Argument or theory The aim of the study was to investigate the relationship between sellar measurements or spans and canine impaction, hyperdontia, or hypodontia. Plan: 68 individuals with dental agenesis, 17 individuals with hypodontia, and 78 individuals with impacted canines all had lateral cephalometric radiographs taken. A benchmark group's straight components are used to identify and compare the straight components of sellaturcica (47 people). The level of STB from each radiograph is assessed using a normalised scoring system. As compared to controls, the recurrence of partial and complete calcifications of the sella in those with dental anomalies is increased. STB can impact the interlined separation yet doesn't influence other direct elements of sella. No measurably critical contrast has been found in sellar measurements and STB articulation while assessing radiographs at various ages. Ends: STB is often initiated in affected personsby dental irregularities.

Hence, from the present study we can conclude that the presence of the supernumerary teeth is meaningfully associated with the anatomical variants of sellaturcica. Although, bridging is the most common anatomical variant associated with the supernumerary teeth but, presence of other anatomical variants of sellaturcica with hypertrophic clinoid process, hypo trophicclinoid process, notched clinoid process, pyramidal, double delineation of the floor, and oblique contour of floor should also be taken into consideration while predicting for the occurrence of supernumerary teeth in a subject in nearby future.

REFERENCES

1. Demiriz L, Durmuşlar MC, Mısır AF. Prevalence and characteristics of supernumerary teeth: A survey on 7348 people. J IntSocPrev Community Dent. 2015;5 (Suppl1):S39-S43. doi:10.4103/2231-0762.156151
2. Leonardi R, Barbato E, Vichi M, CaltabianoM. A Sellaturcica bridge insubjects with dental anomalies.Eur J Orthod 2006;28:580-5.
3. Najim AA, Nakib LA. A cephalometric study of Sellaturcica size andmorphology among young Iraqi normal population in comparison to affected personswith maxillary malposed canine. J Baghdad Coll Dent2011; 23:53-8.
4. Ali B, Shaikh A, Fida M Association between Sellaturcica bridging andpalatal canine impaction. Am J OrthodDentofacialOrthop 2014; 146:437-41.[5]. Ani GS, Jose J, Prashant SP, Wane M. Morphology of Sellaturcica in subjects with highly placed canines. Int J Bioassays 2015; 6:3968-72.
5. Sami Q, Ahmed I. Association betweenSellaturcica bridging and buccaland palatal canine impaction. Asian Academic Research Journal ofMultidisciplinary2016;3:37-46.
6. Leonardi R, Farella M, Cobourne MT. An association between Sellaturcicabridging and dental transposition.Eur J Orthod 2011;33:461-5.
7. Melsen B. The cranial base: the postnatal development of the cranial base studied historically on human autopsy material. ActaOdontol Scand. 1974;32:57–71.
8. Miletich I, Sharpe PT. Neural crest contribution to mammalian tooth formation. Birth Defects Res C Embryo Today. 2004;72(2):200–212.
9. Morotomi T, Kawano S, Toyono T, et al. In vitro differentiation of dental epithelial progenitor cells through epithelial-mesenchymal interactions. Arch Oral Biol. 2005;50(8):695–705.
10. Bishara SE, Athanasiou AE. Cephalometric methods for assessment of dentofacial changes. In: Athanasiou AE, editor. Orthodontic Cephalometry. London: Mosby-Wolfe; 1995:105–125.
11. Dubrul EL. Oral anatomy. In: Sicher H, Dubrul EL, editors. The Skull. New Delhi: AITBS Publishers & Distributor; 1996:13.
12. DuBoulay G, Tricky S. The choice of radiological investigations in the management of tumors around the sella. ClinRadiol. 1967;18(4):349–365.
13. Skrzat J, Szewczyk R, Walocha J. The ossified interclinoid ligament. Folia Morphol. 2006:65(3):242–245.
14. Prarthna B, Saurabh S, Batra P, Dhillon M. Sellaturcica morphology – a diagnostic marker for skeletal class II malocclusion. J Dent Specialties. 2015;3:22–28.
15. Axelsson S, Storhaug K, Kjær I. Post-natal size and morphology of the sell turcica. Longitudinal cephalometric standards for Norwegians between 6 and 21 years of age. Eur J Orthod. 2004;26(6):597–604.
16. Kjaer I. Sellaturcica morphology and the pituitary gland – a new contribution to craniofacial diagnosis based on histology and neuroradiology. Eur J Orthod. 2015;37(1)28–36.
17. Dixit S, Kafle D, Bornstein M, Sanjel S. SellaTurcica Bridging as a Predicator of Dentofacial Anomalies: A Cephalometric Analysis. Orthodontic Journal of Nepal 2017;7(2):32-36.