Prevalence of Supernumerary Teeth in Bengali Population of India

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ABSTRACT

Introduction: A supernumerary tooth is an additional tooth to the normal series and can be located in almost any region of the dental arch. It can come across as an inadvertent finding on a radiograph or following spontaneous eruption. Multiple supernumerary teeth are associated with cleft lip and palate, cleidocranial dysplasia and Gardner's syndrome. This study attempts to evaluate the frequency, demographics, epidemiological characteristic history, different clinical parameters, eruptive complications and presence of any associated pathology or syndrome in subjects of a specific community of India with supernumerary tooth.

Material and Methods: A total of 16,249 patients of 5-65 years of age were screened over a period of one year. Along with proper history taking, the identification of the supernumerary tooth was confirmed clinically and radiologically. Data relating to gender, age, location, morphology, axial inclination and presence of associated pathology or syndromes with respect to supernumerary tooth were recorded.

Results: A total of 200 supernumerary teeth were observed in 127 patients (63.5%) of whom 92 were males (72.4%) and the rest females (27.6%). Of the 200 supernumerary teeth, 119 (93.7%) were erupted and seen clinically whereas 81 teeth (63.77%) were impacted and were accidental findings on radiographs. Besides these, several other data were collected.

Conclusion: The identification of this anomaly provides a clue towards the possibility of any complication, pathologies, other related dental anomalies, syndromes and familial association in the Bengali population of Burdwan district, West Bengal, India.

Keywords: Cleidocranial dysplasia; Gardner's syndrome; Mesiodens; Prevalence; Supernumerary

INTRODUCTION

The term supernumerary means "being in excess of the usual or prescribed number". Supernumerary teeth are defined as "any tooth or odontogenic structure that is formed from a tooth germ in excess of the usual number for any given region of the dental arch."[1] Teeth additional to the normal complement have been found in the earliest remains of humans and have been recorded in the dental literature since the days of Paul of Aegina in the seventh century AD.[2] The term "hyperdontia" is preferred by some authors to describe the dentition which contains one or more supernumerary teeth.[3]

Supernumerary teeth have been found in all areas of the dental arches and may present in both the permanent and primary dentitions, but are five times less frequent in the primary dentition.[4,5] The reported prevalence of supernumerary teeth in the permanent dentition of Caucasians is between 0.15% and 3.9% and it appears to be highest among the Mongoloid racial group, with a reported frequency higher than 3%.[6] Supernumerary teeth appear with a higher frequency in men than in women, with a 2:1 ratio.[6,7]

Supernumerary teeth may be classified according to their morphology and location. The morphological classification includes conical, tuberculate, supplemental and odontoma types.[8] The classification based on location is in accordance with the work of Bolk, which groups the supernumerary teeth as mesiodens (between the two central incisors), paramolars (rudimentary teeth situated lateral to the molars) and distomolars (distal to the third molar).[9] They are more commonly located on the maxillary midline, where they are referred to as mesiodens, representing 80% of all the supernumerary teeth.[10] This location is followed in decreasing order of frequency by upper distomolars, upper paramolars and proportionately far behind by lower premolars, upper lateral incisors, lower distomolars and lower central incisors. Upper premolars are exceptional, as are upper and lower canines and lower lateral incisors.[10] Multiple supernumerary teeth are rare and most cases are syndrome related, while the prevalence rates for non-syndromic multiple supernumerary teeth is less than 1%.[6]

Regarding the etiology of supernumerary teeth, most authors point to phylogenetic factors, specifically hyperactivity within the dental lamina, causing the appearance of additional dental buds.[11] Inheritance is also considered to be a major contributor to the development of supernumerary teeth. Supernumerary teeth are seen to run in families over several generations, sometimes skipping one or more generations. Supernumerary teeth are often associated with certain syndromes for example, Gardner's syndrome, cleidocranial dysplasia and some conditions such as cleft lip and/or palate.[12-13]

The purpose of the study was to evaluate the frequency, demographics, epidemiological characteristics history, different clinical parameters, eruptive complications and presence of any associated pathology or syndrome in patients with supernumerary tooth.

MATERIAL AND METHODS

All patients visiting the outpatient department of Burdwan Dental College and Hospital, Burdwan, West Bengal, India for various dental and oral complaints were screened clini-

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cally for supernumerary teeth over a time period of one year from November 2014 to October 2015. Along with proper history taking, the identification of the supernumerary tooth was confirmed clinically and radiologically. Standard intraoral examinations were made with the help of a mouth mirror and a high-intensity light. Data relating to gender, age, location, morphology, axial inclination, mechanical accidents and presence of associated pathology or syndromes with respect to supernumerary tooth were recorded. When a supernumerary tooth was confirmed the presence or absence of any other impacted supernumerary tooth/teeth and associated lesions, if any were excluded. The variables were statistically analyzed using SPSS version 16.

RESULTS

A total of 16,249 patients of 5-65 years of age were screened over a period of one year for the presence of supernumerary teeth. The supernumerary teeth were most commonly manifested in the 3rd decade of life (33.1%) followed by the 2nd decade (21.3%). Nine patients (7.0%) gave a family history about the presence of supernumerary teeth. However none of the patients with multiple supernumerary teeth were found to be associated with any syndromes.

A total of 200 supernumerary teeth were observed in 127 patients (63.5%) of whom 92 were males (72.4%) and the rest females (27.6%). Of the 200 supernumerary teeth, 119 (93.7%) were erupted and seen clinically whereas 81 teeth (63.77%) were impacted and were accidental findings on radiographs. While most of the patients presented clinically with one supernumerary tooth only, the rest varied from two-four in number (Table 1). Of the 81 impacted supernumerary teeth, the most common presentation was one supernumerary tooth per patient while others presented variation from two-five teeth. (Table 2).

In 89 cases, supernumerary teeth (70.1%) were present in the upper arch, in 28 cases (22.0%) in the lower arch and in 10 cases (7.9%) they were present in both the arches. Location wise break-up of the supernumerary teeth is presented in Table 3.

Regarding the morphology of the supernumerary teeth, in most of the cases they had a non-specific morphology (65.4%, n=83). (Table 4). In 50.4% of the cases (n=64) the supernumerary teeth were oriented normally. They were tilted in 59 cases (46.5%) and inverted in four cases (3.1%). Also majority of the supernumerary teeth showed complete root formation (86% n=172), with only 28 teeth having incomplete roots (14%).

Another objective of our study was the analysis of the clinical-eruptive complications associated with the supernumerary teeth. In this context we found displacement of adjacent teeth (22.0% n=28) to be the most frequent problem followed by prevention of eruption of the adjacent teeth (6.3% n=8). Caries and periapical pathology were observed in eight cases (6.3%). Resorption of the adjacent teeth, another frequent complication of supernumerary teeth was however not seen in any of our cases.

DISCUSSION

A total of 16,249 patients were screened for the presence of supernumerary teeth. The overall prevalence of supernumerary teeth was 0.78 (n=127). According to the various literature sources, the reported prevalence of supernumerary teeth varies according to the population studied between 0.1-3.8%.[6] In the present study, of the total 200 supernumerary teeth, 93.7% were erupted while 63.7% were impacted and were incidental findings on radiographs. Multiple additional supernumerary teeth were detected during radiographic examination of some patients who showed clinically single supernumerary tooth. Hence, radiographs play an important role in the early diagnosis and treatment of patients with supernumerary teeth which in turn is important for the prevention of complications.

In our study, supernumerary teeth were more common in males (72.4% versus 27.6% in females), which was in agreement with the observation made by Rajab et al.[6] However, other investigators such as Dominguez et al have observed no difference between the sexes.[14] The supernumerary teeth in the present series of cases were most commonly manifested in the 3rd decade of life (33.1%) which was in coincidence with the findings of other authors who report this decade to be the most common period of supernumerary tooth presentation.[15]

Nos. of supernumerary teeth presented clinically	Nos. of patients	Percentage (%)
1	72	56.7
2	14	11.0
3	5	3.9
4	1	0.8

Table-1: distribution of cases with erupted supernumerary teeth

Nos. of impacted supernumerary teeth	Nos. of patients	Percentage (%)
1	33	26.0
2	13	10.2
3	1	0.8
4	1	0.8
5	3	2.4

Table-2: Distribution of cases with impacted supernumerary teeth

Location	Nos. of cases	Percentage (%)
Anterior region	49	38.6
Canine region	1	0.8
Premolar region	36	28.3
Molar region	19	15.0
Distomolar region	22	17.3

Table-3: Location wise distribution of supernumerary teeth

Morphology	Nos. of cases	Percentage (%)
Non specific	83	65.4
Anterior tooth	10	7.9
Canine	1	0.8
Premolar	30	23.6
Molar	3	2.4

Table-4: Morphology wise distribution of supernumerary teeth

Ma Isabel Leco Berrocal et al. did an observational study of the frequency of supernumerary teeth in a population of 2000 patients in the European University of Madrid.[16] They observed supernumerary teeth in 1.05% of the subjects (mean age 20.2 years), with a greater frequency in males. The most frequent location was in the maxilla (79.2%), fundamentally in the distomolar zone and at pre-maxillary level. The presence of mechanical accidents was the most frequent complication (54%), the displacement of adjacent teeth being the most common finding, along with the presence of follicular cysts.

Paula Fernández Montenegro et al. did a retrospective study in a population of 36,057 patients.[17] In their study, the most frequent supernumerary teeth identified were mesiodens (46.9%), followed by premolars (24.1%) and distomolars (18%). As for location, 74.5% of the supernumerary teeth were found in the maxilla while 46.9% were present in the palatine/lingual area. Heteromorphology was noted in two thirds of the supernumerary teeth, with conical shape being the most frequent.

Robert P. Anthonappa et al. did a retrospective study among 208 children of southern China aged between 2 to 16 years.[18] The study showed that males were more frequently affected than females in the ratio of 3.1:1. Of the 283 supernumerary teeth, 95.0% were located in the premaxilla, 71.5% were conical, 70.7% were unilateral, 29.3% were bilateral, 47.7% were inverted and 16.9% were erupted. The mean age at the time of diagnosis and removal of the supernumerary teeth was 7.3 ± 2.7 years (the minimum age was 2.1 years) and 8.1 ± 2.7 years (the minimum age was 4.1 years), respectively. 70% of the children were in the mixed dentition stage and 81.3% of the supernumerary teeth were removed under general anesthesia.

Açkgöz et al. did a study (1999-2004) to evaluate the radiological and clinical findings of supernumerary teeth in 9550 male patients examined.[19] 251 supernumerary teeth were detected in total and were found to be located mostly in the premolar region. The prevalence of multiple supernumerary teeth was 0.06%. Out of 37 multiple supernumerary teeth examined, 30 were impacted. Various associated anomalies were seen in 21.6% of cases. Although the mean age was high (23.1 years), no pathologies such as root resorption of adjacent teeth or cystic formation were observed in their study.

L. D. Rajab et al. did a survey to investigate the characteristics of supernumerary teeth among children attending the Department of Paediatric Dentistry at the Jordan University Hospital.[6] The study population consisted of 152 children with age ranging from 5 to 15 years. They found that males were affected more than females with a sex ratio of 2·2: 1. 77% of the patients had one supernumerary tooth, 18·4% had two and 4·6% had three or more supernumeraries. 90% of the supernumerary teeth occurred in the premaxilla, of which 92·8% were in the central incisor region and of these 25% were located in the midline. The other 10·4% of the supernumeraries were located in the premolar, canine, molar and lower central incisor regions. Two cases were of non-syndrome supernumerary teeth. 75% of the supernumeraries were conical, 83·1% were in the normal vertical position and 26·5% were erupted. Conical-shaped supernumerary teeth had a significantly higher rate of eruption compared to the tuberculate type.

In this study, 59.5% of the supernumeraries were erupted, which was higher than the previously reported eruption rates.[6,17] In 38.6% of the cases the supernumerary teeth occurred in the premaxilla, which has been identified as the predominant location by many authors, followed by the premolar (28.3%) and distomolar regions (17.3%).[6,17] Only one case presented with a supernumerary tooth in the canine region, which was consistent with the findings of other studies where the presence of supernumerary teeth in the canine region was reported to be rare.[7]

Non-specific morphology of the supernumerary teeth was seen in 65.4% of the cases and these results coincide with the ones reported by Rajab and Hamdan and Kim and Lee.[7,20] As reported by Yousof et al, in the present study also the most common supplemental teeth were the premolars (23.6%).[21] In most of the cases, the supernumerary teeth were orientated normally. This finding differed from that reported by Tay et al, who found most of the supernumerary teeth in an inverted position, but agreed with the findings by Liu et al.[22,23] Regarding root completion, 86% of the cases presented with supernumerary teeth having complete roots.

As for the clinical complications caused by the supernumerary teeth, we found displacement of the adjacent tooth to be the most frequent complication (22%). This was in agreement with the findings of Rajab et al and Asaumi et al.[6,24] In eight cases, the eruption of permanent teeth was obstructed by supernumerary teeth (6.3%). No resorption of adjacent tooth or any other dental anomalies associated with supernumerary teeth were detected. Association of caries and periapical pathology with the supernumerary teeth was observed in 6.3% of our cases. Similar findings were noted by Hattab and Othman.[25]

Although many authors have found a strong familial association of supernumerary teeth with an autosomal dominant transmission, only nine cases with a positive family history of supernumerary teeth were observed in the present case series.[26] This finding suggested that many cases of supernumerary teeth can be purely sporadic with rare familial association. Lastly, though many cases of supernumerary teeth associated with syndromes like Gardner's syndrome, Clediocranial dysostosis, or cleft lip and palate have been reported we did not find any such case. But this finding also was in accordance with the observation made by Batra et al and García et al who reported of cases presenting with multiple supernumerary teeth but not associated with any complex syndrome.[26,27]

CONCLUSION

The results of the present study gave some information on the prevalence of supernumerary teeth in the Bengali population of Burdwan district, West Bengal, India. The identification of this anomaly could provide a clue towards the possibility of any complication, pathologies, other related dental anomalies, syndromes and familial association.

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