

Research Article

Prevalence and Characteristics of Supernumerary Teeth in Patients from Ras Al Khaimah: A Retrospective Study from a Teaching Dental Hospital in the UAE

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Abstract

Supernumerary teeth are teeth that exceed the normal dental formula. They have variable characteristics and may cause a number of clinical complications. In the Middle East, a prevalence of 0.3 – 2.14% has been observed; however, the number of studies of this condition is limited in the region. This study examined the prevalence and characteristics of supernumerary teeth in patients from RAK College of Dental Sciences Dental Clinic. A total of 2,925 panoramic radiographs were analyzed and demographic-clinical data was extracted from patient files. A prevalence of 0.75% was observed. Affected patients were predominantly South Asian males. The teeth were mostly supplemental, Para-premolars and impacted with low incidence of disto-molars and no difference in occurrence in the maxilla or mandible. Occurrence of multiple supernumerary teeth was low and restricted to one jaw. This study suggests that one of every 133 patients will have impacted supernumerary teeth that can be expected in the premolar area of the maxilla/mandible, which should be considered when planning community oral health diagnosis and dental treatment strategies.

INTRODUCTION

Supernumerary teeth can be defined as teeth that exceed the normal dental formula regardless of their location and morphology. They can be observed in any part of the dental arch in the deciduous and permanent dentition, can be erupted or impacted, normal in size/shape or deformed, single or multiple, and unilateral or bilateral [1,2]. The prevalence of supernumerary teeth in permanent dentition is higher than primary dentition in various populations. The exact cause of supernumerary teeth is unknown; however, there are several theories that have been introduced that explained their presence. Various genetic and environmental etiological factors have been associated with supernumerary teeth with or without syndromic associations [3,4]. The most accepted theory which explained that supernumerary teeth developed from horizontal proliferation or hyperactivity of lamina dura [5]. Supernumerary teeth may be associated with several syndromes like cleidocranial dysplasia, Gardner's syndrome, Ehlers-Danlos syndrome and fabry-anderson. In these syndromes supernumerary teeth appear in multiple forms. Even though these teeth may occur in non syndromic patient it may appear as single or double and unilateral or bilateral [5,6]. The classification of supernumerary teeth based on their location, the teeth which are found between

two central incisors in the midline are called mesiodens and supernumerary teeth in the molar region adjacent or distal to the normal sequence of teeth are referred as paramolar or distomolar. They can also be classified according to their shape and morphology as conical, tuberculate, supplemental, and odontomas [3,6].

The most common supernumerary teeth listed according to their prevalence are mesiodens, which found in the anterior region of the maxilla, maxillary fourth molar, maxillary premolar, mandibular premolars, maxillary lateral incisors, mandibular fourth molar and maxillary premolars [1,2]. According to previous studies, the prevalence of supernumerary teeth can vary among populations but can be of 1-14% in the permanent dentition and males are affected approximately twice as frequently compared to females [1,2]. In the middle east prevalence of 0.3-2.14 % has been observed; however, the number of studies of prevalence of this condition are limited in the region [5,7]. About 90-98% of supernumerary teeth occur in the maxilla and 90% of these are restricted to the pre-maxilla (5.8). Supernumerary teeth can erupt fully or remain impacted. They can cause complications such as diastema, development of odontogenic cyst, resorption of neighbor teeth deviation or obstruction of the eruption of other teeth, and oral infections such as periodontal disease, caries and

pericoronitis [8-10]. The diagnosis of supernumerary teeth is usually obtained from radiographic and clinical examination and their treatment can differ from one case to another depending on the tooth location and consequent complications. Treatment options include status follow up, surgical removal and orthodontics alignment [1,2,9,10].

The purpose of this study is to examine the prevalence and characteristics of supernumerary teeth in patients treated at RAK College of Dental Sciences Dental Clinic. We expect that the prevalence of supernumerary teeth will be higher in males rather than females and that the occurrence of these teeth will be mainly in the maxilla.

MATERIALS AND METHODS

This observational study retrospectively analyzed 2925 panoramic radiographs from non-syndromic patients who had been examined at RAK College of Dental Science (Ras Al Khaimah, United Arab Emirates) from August, 2013 to May, 2016. All radiographs regardless of age, gender or nationality of the patient were included. Radiographs belonging to files with missing information were not included in the study and were not added to the final number of radiographs analyzed. Supernumerary primary teeth were not included in the study. The study was approved by the RAK Medical and Health Sciences University Research Ethics Committee (16-2015-UG-D) and the Ras Al Khaimah Research Ethics Committee (10/2016-UG). Written consent was signed by patients during consultation for use of diagnostic and treatment progress files for research by members of RAK College of Dental Sciences, RAK Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates. Data collected from the radiographs included tooth morphology (Figure 1), location of supernumerary teeth (Figure 2), number of supernumerary teeth per patient and eruption status. Patient details included age, gender and country of origin. The data was summarized to indicate the most common characteristics of supernumerary teeth. The data was analyzed using chi-square tests ($p < 0.05$).

RESULTS AND DISCUSSION

The prevalence of supernumerary teeth in our population was found to be 0.75%. From the 22 patients with supernumerary

teeth a significantly higher number of males 17 (77.27%) was observed. The occurrence of supernumerary teeth was significantly low in all the studied racial groups, and statistical analysis demonstrated that the occurrence of supernumerary teeth in the studied sample is not dependant on the patient's race. A significantly high number of patients (16, 50%) reported with supplemental teeth compared to patients had tuberculate teeth (10, 31.25%) and conical teeth (6, 18.75%). The distribution of supernumerary teeth was significantly higher in one jaw (86.36%). The majority of patients presented single supernumerary teeth (63.63%) instead of multiple supernumerary teeth (36.36%). There is no significant difference in the frequency of supernumerary teeth occurring in the maxilla or mandible in our sample. The most prevalent supernumerary tooth was found in the premolar region (71.87%) and least prevalent supernumerary teeth were the paramolars (6.25%) and distomolars (6.25%). The incidence of mesiodens was not significantly high (15.6%). A significantly higher number of patients reported with impacted supernumerary teeth (93.75%) with low incidence of erupted supernumerary teeth (6.25%) (Table 1).

The purpose of this study was to examine the prevalence and characteristics of supernumerary teeth in patients treated at RAK College of Dental Sciences Dental Clinic. Gender distribution, number of supernumerary teeth, location and anatomic characteristics of the teeth were analyzed.

In the present study, supernumerary teeth were found in only 22 patients, both male and female, between 18 to 48 years of age. Various studies have described the prevalence and gender differences in occurrence of these teeth in different populations. The occurrence of supernumerary teeth in our population is 0.75%, which is similar to observation from studies made in Spain, India, Turkey and Saudi Arabia where 0.3-0.8% of the studied samples would present the condition [1,2,5,7]. The occurrence of supernumerary teeth is higher in males than females in the preset study, which is in close agreement with studies conducted by Parolia [1] and Ata-Ali [2] in India and Spain, respectively; although it contradicts Giancotti [11] and Berrocal [12] who found no difference between genders in Italy. A low occurrence of multiple supernumerary teeth in one patient was observed that is in agreement with studies in Spain, Italy,

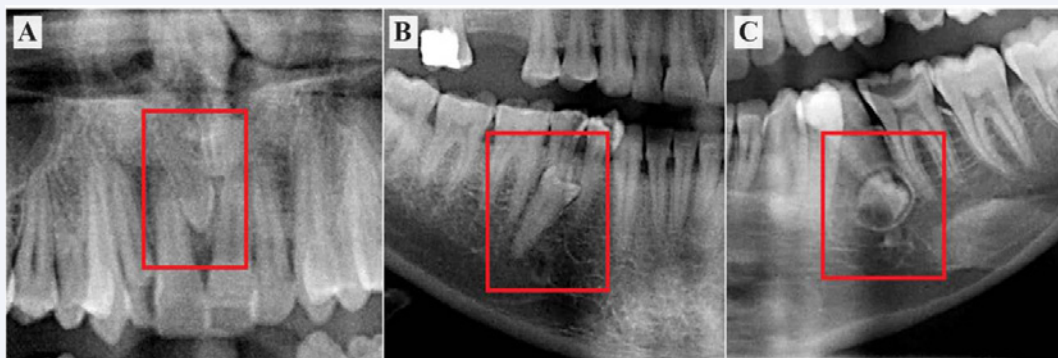


Figure 1 Supernumerary teeth shape variation. Cropped panoramic radiographs reveal (A) conical tooth, (B) supplemental tooth and (C) tuberculate tooth.

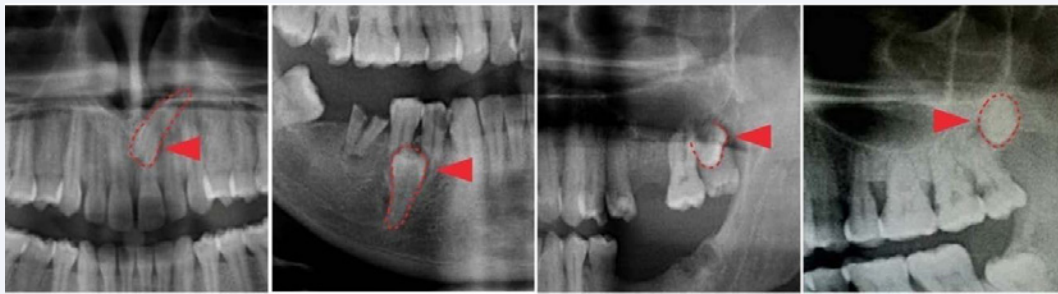


Figure 2 Classification of supernumerary teeth based on location. Cropped panoramic radiographs which show (A) mesiodens tooth between maxillary central incisors, (B) parapremolar tooth between mandibular premolar, (C) paramolar tooth between maxillary molar and (D) distomolar tooth behind maxillary third molar.

Table 1: Characteristics of the supernumerary teeth found in the studied sample.

Supernumerary Tooth Characteristics		n	Percentage	P-value	Significance
Gender	Male	17	77.27	0.0105	*
	Female	5	22.72		
Race*	South Asian	7	0.69	0.6298	ns
	Middle Eastern	7	0.65	0.7896	ns
	East Asian	1	0.60	0.8152	ns
	Other	7	1.04	0.3258	ns
Type	Mesiodens	5	15.60	0.2206	ns
	Parapremolar	23	71.87	0.0001	***
	Paramolar	2	6.25	0.0143	*
	Distomolar	2	6.25	0.0143	*
Number	Single	14	63.63	0.2008	ns
	Multiple	8	36.36		
Location	Maxilla	12	37.50	0.1572	ns
	Mandible	20	62.50		
Eruption Status	Erupted	2	6.25	0.0001	***
	Impacted	30	93.75		
Morphology	Conical	6	18.75	0.0801	ns
	Supplemental	16	50.00	0.0455	*
	Tuberculate	10	31.25	0.8026	Ns

(*) The prevalence was calculated as a percentage of supernumerary teeth from the total number of patients from each racial group

Turkey and Iran representing where less than 1% of the studied samples would have multiple supernumerary teeth [2,11,13,14]. Most cases of multiple supernumerary teeth have been reported in association with syndromes. Supernumerary teeth are thought to occur ten times more frequently in the upper jaw than in the lower jaw as shown in reports where 90-98% of supernumerary teeth occur in the maxilla [5,8]; however, no significant difference in the frequency of supernumerary teeth occurring in the maxilla or mandible was observed in the present study shows. The most commonly observed supernumerary tooth has been reported to be the mesiodens [1,2], which can be followed by distomolars [15,16] or by lateral incisors and premolars [17,18]. The results of the present study in the studied population showed that the most commonly found supernumerary teeth were para premolars while the least prevalent were the distomolar and paramolar and no significant occurrence of mesiodens. The variation in the prevalence of para-premolars could be population dependent as the prevalence of a particular class of supernumerary tooth can differ among reports.

Supernumerary teeth may erupt in the oral cavity, or remain impacted. In our sample, supernumerary teeth are most frequently un-erupted as previously reported by Celikoglu [19], who found about 79.2% of supernumerary cases in Turkey were not erupted. Supernumerary teeth, impacted or erupted, may remain in position for years without causing any disturbances and clinical manifestations. However, in some cases, they may cause complications like impaction of permanent teeth, delayed or ectopic eruption of adjacent teeth, malocclusions like midline diastema or crowding and formation of cysts with bone destruction and root resorption of adjacent teeth [20]. The management of these teeth varies from extraction/endodontic therapy or by maintaining them in the arch and frequent observation [1]. In our sample, and based on the review of the patient clinical files, all of the cases were left untreated.

The limitations of this study include incomplete or lost patient clinical files that had to be omitted from the study, as well as lack of information on the reasons why the teeth were left

untreated. Racial variation in the studied sample that could have led to greater variation of the results compared to other more homogeneous samples that have been reported in other regions. In addition, the sample was limited to one dental hospital and may not be representative of the country's multi-ethnic population. Further studies should explore the etiological factors, environmental or genetic, that are common to the studied population.

CONCLUSION

This retrospective study suggests that 1 out of every 133 patients in the area will have supernumerary teeth. Supernumerary teeth will be commonly found in the premolar area of either the maxilla or mandible; therefore, practicing dentists in the UAE should consider this when observing associated signs and symptoms of tooth impaction in the premolar area.

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