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Supernumerary teeth in the premaxillary region: its effects on the eruption and occlusion of the permanent incisors

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ABSTRACT: The presence of supernumerary teeth in the premaxillary region may cause a variety of pathological effects. This study was carried out to determine the various aspects of supernumerary teeth in the premaxillary region, particularly the effects of the supernumerary teeth on the permanent incisors and surrounding tissues. Approximately 20 percent of the patients (n=49) with supernumerary teeth did not present with any abnormality. A high proportion of patients (37.9 percent) had delayed or failure of eruption of permanent teeth and 24.1 percent had rotation or displacement of permanent teeth. Other effects observed were median diastema and cystic changes around the unerupted supernumerary tooth. The high proportion of pathological effects seen showed that early diagnosis of the anomaly is important to intercept damage to the adjacent normal teeth and surrounding tissues. However, no cases of root resorption of the permanent teeth due to the presence of supernumeraries were observed.

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Key words: supernumerary, eruption, rotation, diastema

INTRODUCTION

A *supernumerary tooth (ST)* is an extra tooth which is found in the dentition. This extra tooth may be morphologically similar to normal teeth or it may have an abnormal shape and size. Although ST can occur in the primary and permanent dentitions, it is more frequently seen in the permanent dentition (Brook 1974). The ST may erupt into the oral cavity or remain completely embedded or impacted in the jaws. A large percentage of these teeth are unerupted and the proportion of unerupted ST depended on the ages of the subjects at the time of clinical examination (Primosh 1981). In the young children during the early mixed dentition stage, a very high percentage of ST (71-91 percent) had been reported as unerupted (Ravn 1961, Luten 1971, Bergstrom 1977). However, the percentage of unerupted ST was reported as 42-60 percent in slightly older populations (Grahnen and Lindahl 1961, Di Biase 1969, Primosch 1981, Nik-Hussein 1985).

A very high proportion of the ST are located in the premaxillary region. Unless they are discovered early and managed properly, ST may cause a variety of pathological disturbances. These disturbances are associated with both the erupted as well as the unerupted ST.

The purpose of this investigation is to report on the various aspects of ST in the premaxillary region of Malaysian children, particularly the effects of ST on the eruption and occlusion of permanent incisors and also its effects on the permanent teeth and the surrounding tissues.

MATERIALS AND METHODS

A total of 49 patients with ST in the premaxillary region seen at the Faculty of Dentistry, University of Malaya were included in this study. The ages of the patients ranged from 6-15 years. A ST was diagnosed if any tooth or structure was seen in excess of the normal number for a given region of the dental arch (Brook 1974).

The eruption of the permanent tooth was considered delayed or failed to erupt when the expected clinical crown height of the contralateral tooth was seen.

A median diastema was diagnosed when a space existed between the two central incisors. However, in cases where a ST (mesioden) had erupted in this space, a median diastema was identified when the erupted height of the mesioden was less than half the expected clinical height of the permanent central incisors.

RESULTS

Table 1 shows the distribution of ST according to sex and number of ST. A total of 49 patients, 31 males and 18 females had ST. There were 40 patients with single occurrence of ST, whilst the other 9 patients had 2 ST each.

Table 2 shows the pathological effects of the ST on the permanent dentition and surrounding bony areas. Overall, about 20 percent of the supernumeraries in the

Table 1.
Distribution of supernumerary teeth (ST) according to sex and number of ST

	Number of patients with one ST	Number of patients with two ST	Total
Male	23	8	31
Female	17	1	18
Total	40	9	49

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Table 2.
Effects of supernumerary teeth (ST) on permanent incisors

Symptoms	Erupted ST No.	%	Unerupted ST No.	%	Total No.	%
No abnormality	5	21.7	7	20.0	12	20.7
Delayed/failure on eruption	3	13.0	19	54.3	22	37.9
Rotation or displacement	10	43.5	4	11.4	14	24.1
Diastema	5	21.7	4	11.4	9	15.5
Cystic changes	-	-	1	2.9	1	1.7
Total	23	99.9*	35	100.00	58	99.9*

*Rounding off error

premaxillary region presented with no abnormality to the permanent teeth. The other 80 percent of the ST were associated with a variety of pathological disturbances. The most common effect caused by the erupted ST was rotation or displacement of the permanent teeth. However, the most common effect caused by the unerupted ST was delayed or failure of eruption of the permanent teeth. Other disturbances observed were median diastema and cystic changes around the unerupted ST. No cases of root resorption of the permanent teeth due to the presence of the ST was observed.

DISCUSSION

ST are fairly common occurrences and have been reported in many ethnic groups, the prevalence ranges from 1-3 percent (Parry and Iyer 1961, Bergstrom 1977, Locht 1980, Ruprecht 1984, Nik-Hussein 1985). Although ST may be located anywhere in the jaws, approximately 90 percent of all the ST are located in the premaxilla (Parry and Iyer 1961, Luten 1967, Bergstrom 1977, Nik-Hussein 1985). The presence of ST in this region often cause diagnostic and management problems to the dental practitioners as several complications could occur. In this study, it was found that only 20 percent of the ST which were located in the premaxillary region did not have any pathological effect on the permanent teeth or surrounding tissues. This finding is in agreement with results from studies carried out by Parry and Iyer (1964), Di Biase (1964) and Tay et al. (1984).

A high proportion of delayed or failure of eruption of the permanent teeth (54.3 percent) was observed in cases where an ST was diagnosed. The overall percentage of delayed eruption of erupted and unerupted ST was 37.9 percent and this finding is within the range of 30-60 percent as reported by previous studies (Gardiner 1961, Grahnen and Lindahl 1961, Parry and Iyer 1961 Day 1964, Howard 1967, Di Biase 1969). The eruption of permanent teeth was disrupted because the ST had prevented the normal eruption process of the permanent teeth by acting as a physical obstruction. This disruption in the normal eruptive pattern is most serious especially in the undiagnosed cases in which the patients were most certainly unaware of its presence. In the case of erupted ST, delayed eruption was not a major problem and accounted for only 13.0 percent of the complications for the erupted ST. This is because most of the ST which were located in the premaxillary region were morphologically dissimilar to normal teeth, thus its presence could have prompted the patient or parents to seek dental treatment and thus prevented this complication from occurring.

In cases with erupted ST, the most common effect seen was rotation or displacement of the permanent teeth (43.5 percent). Overall, 24.1 percent of the patients with ST presented with rotated or displaced permanent teeth. The prevalence of displacement of the adjacent teeth that had been reported in the literature ranges from 22-63 percent of the cases. This interference in the normal position of the permanent teeth was caused by lack of space due to the presence of the ST which had utilised some of the space available for proper alignment of the permanent teeth. Although the permanent teeth could be displaced mesiodistally or labiolingually, depending on the position and size of the ST, 82 percent of the displacement occurred labially (Di Biase 1976).

Another effect caused by the ST is median diastema. There are studies which reported that the prevalence was extremely rare (Ferguson et al. 1973). Others reported that it was relatively common. Koch et al. 1986 reported that median diastema was found in 10 percent of all cases with ST. Day (1964) reported that 15 percent of 80 consecutive cases of ST seen in the premaxillary region presented with a median diastema, whilst Tay et al. (1984) reported that 38.7 percent of their sample which involved only unerupted ST in the premaxillary region presented with median diastema. These widely differing results could have resulted from the manner in which median diastema was diagnosed. Diastema actually means space occurring between 2 adjacent teeth (Harty and Rogston 1987), thus a patient seen with a fully erupted mesioden between the central incisors should not be considered to have a median diastema as a space do not exist between the two central incisors. However, a problem arises in cases where the ST was not fully erupted. In the studies published, the authors did not specify the criteria which was used to diagnose median diastema in cases of erupted ST. In this study, a median diastema was diagnosed when the erupted height of the mesioden is less than half the clinical height of the permanent central incisors. Using this criteria, median diastema was seen in 21.7 percent of cases with erupted ST. The diagnosis of median diastema in cases of unerupted ST was straight forward and a prevalence of 11.4 percent was noted. Thus, this finding greatly differs from the results reported by Tay et al. (1984).

One case presented with a cyst which was related to the presence of the unerupted ST. This rare finding had also been reported by Stafne (1931), Gardiner (1961), Day (1964), Di Biase 1969, Di Biase 1971, Bodin et al. (1981) and Koch et al. (1986).

No cases of root resorption of permanent teeth was seen and review of literature showed that it had only been reported by Jokela (1976) and Rapp and Winter (1979). However, in both cases, there was a history of trauma to the resorbing tooth prior to the detection of the root resorption and this could have been a resulting or contributory factor.

Other rare findings which have been thought to be due to the presence of the ST but not seen in this study are the loss of vitality of the central incisors (Douglas and Kresberg 1957) and eruption of the ST into the nasal cavity (Stafne 1931, Quinn and Miles 1959, Levine 1961, Thawley and LaFerriere 1977).

There is universal agreement that in most cases, erupted ST should be treated by extraction of the tooth. Controversy, however, arises regarding the management of unerupted ST. Whilst it is agreed that an unerupted ST is indicated for removal if any pathological effects were seen, a lot of discussions are generated regarding the prophylactic or preventive surgical removal of unerupted ST where no apparent complications are present. Simpson (1930), Brodway and Gould (1960) and Di Biase (1971) felt that the ST should be left in situ with periodic radiographs taken.

Others are of the opinion that surgical removal is indicated as they felt that the chances of complications developing are great if the tooth is left untreated, the teeth are usually non functional and recurrence of the condition after removal is extremely rare (Levine 1961, Primosch 1981). However, opinions differ regarding the optimal time for surgical intervention: that is, early (fairly soon after diagnosis) or delayed (after root development of adjacent teeth has been completed). Weber (1964) felt that all ST, except supplemental primary teeth should be extracted early as he felt that they usually cause malocclusion, dental pathology or both. It was also felt that delayed removal could lead to inability of permanent incisors to erupt, even after the obstruction was removed due to lack of eruptive potential, loss of space and midline deviation (Brin et al, 1982, Hogstrom and Andersson 1987).

Barren (1983), however, strongly felt that delayed intervention is required as he felt that early intervention could damage the adjacent teeth, resulting in devitalisation and/or root malformation and recommended intervention upon maturation of the central and lateral incisors, at an age around eight to ten years. A recent study by Hogstrom and Andersson (1987) however, found that root development of adjacent teeth was not affected, although surgery was performed before root development of the incisors was completed. Nevertheless, they found that surgical removal of an ST in the premaxilla could cause temporary loss of sensitivity of the permanent teeth, whether surgery was performed when the child was less than 11 years old at the time of surgery or older. Permanent loss of sensitivity, however, was noted in one patient where surgery was performed in a patient from the older group but none in the 'less than 11 year old group'. Koch et al. (1986) are also of the opinion that there is no immediate indication for surgical removal of the tooth if pathological effects are not present. They followed up 52 cases of unerupted ST which were not operated on for periods of between 1 to 22 years after being diagnosed and found that none of these cases had any symptoms of pathological conditions related to the ST.

As the effects of the ST are potentially harmful, early diagnosis of these teeth is of paramount importance to the management of the developing dentition. Each case with an ST should be carefully studied and a proper treatment planning with respect to behaviour, surgery and orthodontics be carried out. If it was decided to delay treatment or surgical intervention, then a close follow-up should be undertaken.

REFERENCES

BARREN,M.V.(1983)
Surgical treatment of an unerupted supernumerary tooth attached to an unerupted permanent incisor
Pediatr.Dent.5:83-84

BERGSTROM,K.(1977)
An orthopanthomographic study of hypodontia, supernumeraries and other anomalies in school children between the ages of 8-9 years
Swed.Dent.J.1:145-157

BODIN,I., JULIN,P. and THOMSSON,M.(1981)
Hyperdontia 111. Supernumerary anterior teeth
Dentomaxillofac.Radiol.10:35-42

BRIN,I., ZILBERMAN,Y. and AZAZ,B.(1982)
The unerupted maxillary central incisor : review of its etiology and treatment
J.Dent.Child.49:352-356

BROADWAY,R.T. and Gould, D.G.(1960)
Surgical requirements of the orthodontists
Brit.Dent.J.108:187-190

BROOK.A.H.(1974)
Dental anomalies of number, form and size : their prevalence in British school children
J.Inst.Ass.Dent.Child.5:37-53

DAY,R.C.B.(1964)
Supernumerary teeth in the premaxillary region
Br.Dent.J.116:304-308

DI BIASE,D.D.(1969)
Midline supernumeraries and eruption of the midline central incisor
Dent.Practit.20:35-40

DI BIASEA,D.D.(1971)
The management of midline supernumeraries
J.Inst.Assoc.Dent.Child.2:21-26

DI BIASE,D.D.(1976)
Dental abnormalities affecting eruption.
In:Eruption and occlusion of teeth. Eds- Poole,D.F.G. and Stack,M.J. Butterworths, 156-168

DOUGLAS,B.L. and KRESBERG,H.(1957)
Mesiodens
Dent.Radiog.Photog.30:70-73

FERGUSON,N.C., Worth,H.M. and DILLABAUGH,G.H.(1973)
An investigation of the occurrence of diastemata and supernumerary teeth
J.Am.Dent.Assoc.87:1409-1410

GARDINER,J.H.(1961)
Supernumerary teeth
Dent.Pract.12:63-73

GRAHNEN,H. and LINDAHL,B.(1961)
Supernumerary teeth in the permanent dentition
Odontol.Revy.12:290-294

HARTY,F.J. and ROGSTON,R.(1987)
Concise illustrated dental dictionary
John Write and Sons Limited

HOGSTROM,A. and ANDERSSON,L.(1987)
Complications related to surgical removal of anterior supernumerary teeth in children
J.Dent.Child.54:341-343

HOWARD,R.D.(1967)
The unerupted incisor. A study of the postoperative history of incisors delayed in their eruption by supernumerary teeth
Dent.Practit.Dent.Rec.17:332-342

JOKELA,M.(1976)
Rapid root resorption in central incisor caused by a supernumerary tooth. A case report
Proc.Finn.Dent.Soc.7:56-59

KOCH,H. SCHWARTZ,O. and KLAUSEN,B. (1986)
Indications for surgical removal of supernumerary teeth in the premaxilla
Int.J.Oral Maxillofac.Surg.15:273-281

LEVINE,N. (1961)
The clinical management of supernumerary teeth
J.Canad.Dent.Assoc.28:297-303

LOCHT,S.(1980)
Panoramic radiographic examination of 704 Danish children aged 9-10 years
Community Dent.Oral Epidemiol.8:375-380

LUTEN,J.R.(1967)
The prevalence of supernumerary teeth in primary and mixed dentition
J.Dent.Child.34:346-353

NIK-HUSSEIN,N.N.(1985)
A radiographic survey of supernumerary teeth in Malaysian children
Sing.Dent.J.10:13-15

PARRY,R.R. and IYER,V.S.(1961)
Supernumerary teeth amongst orthodontic patients in India
Brit.Dent.J.111:257-258

PRIMOSH,R.(1981)
Anterior supernumerary teeth - assessment and surgical intervention in children
Pediatr.Dent.3:204-215

QUINN,J. and MILES,L.(1959)
Bilateral inverted supernumerary central incisors penetrating nasal cavity
J.Oral Surg.Anesth. and Hosp.Dent.Serv.17:61-62

RAPP,R. and WINTER,G.B.(1979)
A colour atlas of clinical conditions in Paedodontics
Wolfe Medical Publications Limited

RAVN,J.J.(1967)
Aplasia, supernumerary teeth and fused teeth in the primary dentition - A epidemiologic study
Scand.J.Dent.Res.79:1-6
RUPRECHT,A., BATNJI,S. and EL-NEWEIHI,E.(1984)
Incidence of supernumerary teeth
Ann.Dent.43:18-21
STAFNE,E.C.(1931)
Supernumerary upper central incisors
Dent.Cosmos73:976-980
SIMPSON,C.D.(1930)
Examples of misinterpretation regarding supernumerary teeth
Int.J.Orth.Oral Surg. and Rad.16:331-337
TAY,F.,PANG,A. and YUEN,S.(1984)
Unerupted maxillary anterior supernumerary teeth:report of 204 cases
J.Dent.Child.51:289-294
THAWLEY,S.E. and LAFERRIERE,K.A.(1977)
Supernumerary nasal tooth
Laryngoscope 87:1770-1773
WEBER,F.N.(1964)
Supernumerary teeth
Dent.Clin.N.Am.509-517

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