

Characteristics, Clinical Features and Treatment of Supernumerary Teeth

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Aims: To determine the characteristics, clinical features and treatment of supernumerary teeth in a general district hospital in the North of Jordan.

Design: This retrospective study was conducted at Prince Rashid Al-Hassan Hospital in Irbid. The medical records of 139 patients who were diagnosed to have supernumerary teeth during the period April 1993 – June 2007 were reviewed. Clinical data on the location, number, eruption status, stages of development, and the types of supernumerary teeth were recorded, along with information on demographics, treatment, associated systemic syndromes, effects on adjacent teeth, and treatment. **Results:** The male to female ratio was 2.2:1. Of the 186 supernumerary teeth investigated (65.0%) were conical, (23.7%) supplemental, (10.8%) tuberculate and (0.5%) odontoma. Two-thirds of the supernumeraries were erupted. Of this sample (21.6%) patients had multiple supernumerary teeth. The most frequent location was at the premaxilla level. The most common effect on adjacent teeth was delayed eruption (23.1%). Simple and surgical extractions of supernumerary teeth were done for (81.7%) of the cases and orthodontic treatment was needed in (74.1%) of patients. **Conclusion:** Supernumerary teeth are an uncommon dental entity. An early diagnosis prevents or reduces the risk of complications and when combined with an earlier removal has a better prognosis.

Keywords: Supernumerary teeth, conical, tuberculate, odontoma.

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INTRODUCTION

Dental practitioners are often confronted with numerous anomalies in the size, shape, number, structure, and eruption of teeth. These anomalies occur because the developing teeth are influenced by a complex interaction of genetic and environmental variables.

Supernumerary teeth are those that are present in excess to the normal set of teeth and were first described between 23 and 79 AD.¹

They may be similar in size and shape to the teeth with which they are associated.² The prevalence of supernumerary teeth ranges from 0.8 to 2.1% in primary and permanent dentition, respectively³, with males being affected more frequently than females.⁴

Supernumerary teeth are typically single and unilateral, with multiple and bilateral occurrence being less common.

Multiple supernumerary teeth are rare in individuals with no other associated diseases or syndromes.⁵ They can be a feature of syndromes such as cleido-cranial dysostosis, Gardner's syndrome, Fabry-Anderson's syndrome or chondroectodermal dysplasia (Ellis-van Creveld syndrome), as well as cleft lip and palate.⁶

Supernumerary teeth can be found in almost any region of the dental arch⁶ and can be erupted or unerupted,⁷ often found after routine radiographic examination.^{8,9}

They may be present both in the primary and permanent dentitions,^{3,10} and influence adjacent permanent teeth by way of crowding, delayed or ectopic eruption.^{3,6,11,12,13}

As the cause of supernumerary teeth remains controversial, several hypotheses have been put forward such as dichotomy of the tooth bud,¹⁴ hyperactivity of the dental lamina¹⁵ and a phylogenetic relic of extinct ancestral tissue.¹

Many studies suggested the role of heredity^{1,17} and environmental factors.^{10,11,12}

Supernumerary teeth are classified according to their morphology and location.

Morphologically, the primary can be normal or conical, whereas the permanent may be odontomal, conical (peg-shaped), tuberculate (barrel-shaped) or supplemental (duplication of the normal series).⁶

The diagnosis is made clinically and radiographically. There is controversy on the treatment of supernumerary

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teeth and the eventual choice often depends on compliance, acceptability to patient and effect on the adjacent permanent teeth.¹⁸

The objectives of this retrospective study are to determine the epidemiological characteristics, clinical features and treatment of supernumerary teeth in a general district hospital in the North of Jordan (Prince Rashid Bin Al-Hassan military hospital).

METHOD

This retrospective study was conducted at Prince Rashid Bin Al-Hassan military hospital in Irbid in the North of Jordan. The medical records of 139 patients who were diagnosed to have supernumerary teeth and referred to our specialized pediatric dental clinic during the period April 1993 – June 2007 were reviewed. The following items were recorded: Patient's age and gender, supernumerary teeth details including type, location, stages of teeth development, eruption status, number and method of treatment, effects on adjacent permanent teeth, associated systemic syndromes and the need for orthodontic treatment after extraction. Consanguinity was not included in the data. Follow up period after treatment extended between 6 and 30 months with a mean of 9.3 months.

RESULTS

A total of 186 supernumerary teeth in 139 pediatric patients were reviewed over a period of 13 years. All the patients were Jordanian. The results showed male to female ratio of 2.2: 1. The age ranged between 2 and 16 years with a mean age of 9.43 years. The average number of supernumerary teeth *per person* was 1.3. Of the 186 supernumerary teeth 121 (65.0%) were conical, 44 (23.7%) supplemental, 20 (10.8%) tuberculate and 1 (0.5%) odontoma, (Table 1). Two-

thirds (67.2%) of the supernumeraries were erupted and (32.8%) were unerupted, (Table 1). Of the unerupted conical type only 2.2% were inverted. Of this sample 18.7% patients had 2 supernumerary teeth and 2.9% patients had 3 or more, (Table 1). The vast majority (88.1%) of the supernumerary teeth were located in the premaxilla, and 22 (11.9%) in upper premolar, canine, lower central incisor and lower premolar areas (Table 1). The most common effect on adjacent teeth was delayed eruption 43 (23.1%) followed by crowding 40(21.5%) and only 22 (11.8%) did not have an effect, (Table 2). Associated anomalies were seen in 10 (7.2%) patients with the cleft lip being the most frequent 6 (4.3%), (Table 3). Simple and surgical extraction of supernumerary teeth was done for 81.7% of the cases and (5.0%) patients refused treatment, (Table 4). Orthodontic treatment was needed in (74.1%) of patients after removal of the offending supernumerary tooth, (22.3%) not needed and (3.6%) patients were not mentioned in their records.

DISCUSSION

Supernumerary teeth are an uncommon dental entity. The overall prevalence in Jordan has not been well characterized since previous studies have examined given geographical areas.

Internationally, the prevalence of supernumerary teeth varies between 0.1 to 3.8 % across the published studies,^{19,20,21} reaching 22.2 % to 28 % in patients with harelip and cleft palate.²²

The appearance of supernumerary teeth is more frequent in the first three decades of life,²¹ an observation also supported by our study in which most of the patients were in the first decade of life.

Males were found to be more frequently affected than females (2.2 to 1) in this pediatric age group. This ratio was

Table 1. Stage and eruption status, number and location of supernumerary teeth.

| | | Conical | Supplemental | Tuberculate | Odontoma | Total | |
|-----------------|-----------|-----------|--------------|-------------|----------|-------------|------------|
| Eruption Stage | Primary | 15(8.1%) | 14(7.5%) | 0(0.0%) | 0(0.0%) | 29(15.6%) | |
| | Permanent | 28(15.1%) | 6(3.2%) | 3(1.6%) | 0(0.0%) | 37(19.9%) | |
| | Mixed | 78(41.9%) | 24(12.9%) | 17(9.1%) | 1(0.5%) | 120(64.5%) | |
| Eruption Status | Erupted | 83(44.6%) | 38 (20.4%) | 4(2.2%) | 0 (0.0%) | 125 (67.2%) | |
| | Unerupted | 38(20.4%) | 6(3.2%) | 16(8.6%) | 1(0.5%) | 61(32.8%) | |
| Number | Single | 75(53.9%) | 25(17.9%) | 8(5.8%) | 1(0.7%) | 109(78.3%) | |
| | Multiple | 15(10.8%) | 8(5.8 %) | 7(5.0%) | 0(0.0%) | 30(21.6%) | |
| Location | UP | CI** | 78(41.9%) | 27(14.5%) | 6(3.2%) | 1(0.5%) | 112(60.1%) |
| | | MX* ML‡ | 31(16.6%) | 11(5.9%) | 10(5.4%) | 0(0.0%) | 52(28.0%) |
| | U Pt | Canine | 5(2.7%) | 1(0.5%) | 2(1.1%) | 0(0.0%) | 8(4.3%) |
| | | LCI## | 5(2.7%) | 2(1.1%) | 1(0.5%) | 0(0.0%) | 8(4.3%) |
| LPT†† | | 2(1.1%) | 2(1.1%) | 1(0.5%) | 0(0.0%) | 5(2.7%) | |
| | | 0(0.0%) | 1(0.5%) | 0(0.0%) | 0(0.0%) | 1(0.5%) | |

UP MX*: Upper Pre-maxilla

CI***: Central incisor

ML‡: Midline

UP†: Upper Premolar

LCI##: Lower central incisor

LPT††: Lower premolar

Table 2. Effect of supernumerary teeth on adjacent teeth.

| Complication | Number |
|--|------------|
| Crowding ± Discomfort ± Caries | 40 (21.5%) |
| Rotation/ Displacement | 23 (12.4%) |
| Diastema | 19 (10.2%) |
| Macrodontia ± Fusion | 6 (3.2%) |
| Delayed Eruption | 43 (23.1%) |
| Impaction/ Unerupted | 12 (6.5%) |
| Palatal Bulge Or Eruption ± Discomfort | 6 (3.2%) |
| Spacing | 4 (2.3%) |
| Follicular cyst | 11 (5.9%) |
| No Effect | 22 (11.8%) |
| Total | 186 (100%) |

Table 3. Associated anomalies with supernumerary teeth.

| Association | Single | Multiple | Total |
|------------------------------|---------|----------|----------|
| Unilateral Cleft Lip | 1(0.7%) | 1(0.7%) | 2(1.4%) |
| Bilateral Cleft Lip | 0(0.0%) | 1(0.7%) | 1(0.7%) |
| Unilateral Cleft Lip+ Palate | 0(0.0%) | 2(1.4%) | 2(1.4%) |
| Cleft Lip + Alveolus | 0(0.0%) | 1(0.7%) | 1(0.7%) |
| Dilacerations | 0(0.0%) | 1(0.7%) | 1(0.7%) |
| Dens Evaginatus | 1(0.7%) | 0(0.0%) | 1(0.7%) |
| Primary Double Tooth | 2(1.4%) | 0(0.0%) | 2(1.4%) |
| Total | 4(2.9%) | 6(4.3%) | 10(7.2%) |

Table 4. Treatment of supernumerary teeth.

| Treatment | | Number Of Patient | Number Of Teeth |
|-------------------|-----------------------|-------------------|-----------------|
| Extraction | Simple | 88 (63.3%) | 108 (58.1%) |
| | Surgical | 28 (20.1%) | 44 (23.7%) |
| | + Separation (Fusion) | 4 (2.9%) | 8 (4.3%) |
| Observation | | 12 (8.6%) | 15 (8.1%) |
| Refused Treatment | | 7 (5.0%) | 11 (5.9%) |
| Total | | 139 (100%) | 186 (100%) |

comparable to that reported by Rajab-Hamdan¹⁸ and slightly higher than that of Battikhi.²³

Our data also concurs with other regional¹² and international studies.^{19, 20, 21}

To explain the higher male prevalence, Rajab-Hamdan referred to the possibilities of differences in sampling and racial variation (with an Asian population showing a higher frequency).

Berrocal *et al*²¹ observed no difference between the sexes. Another study similarly found no significant difference in the sex distribution of primary supernumerary teeth, with males affected approximately twice as frequently as females in the permanent dentition group.⁴

Morphologically, conical supernumerary teeth were present in about two-thirds of the cases. They were found in all dentition stages, with the mixed dentition stage being the most frequent (41.9%) followed by supplemental supernu-

merary teeth (23.7%). Tuberculate supernumerary teeth were less frequently seen (10.8%) and they were present mainly in the mixed stage of dentition and less frequently in the permanent stage. Odontoma was found in 0.5% of the cases in the mixed stage of dentition.

In comparison with other local studies, Rajab-Hamdan¹⁸ found conical supernumerary teeth in 74.8%, tuberculate in 11.9% and supplemental in 6.9%. These prevalence rates are at variance with our findings and, interestingly, odontoma at 6.4% is much higher than our observation. Our findings are closer to that of Battikhi,²³ who assessed 120 patients with supernumerary teeth and he noticed conical supernumerary teeth in 57.5%, supplemental in 24.17%, tuberculate in 17.5% and odontoma in 0.83%.

We found approximately two-thirds of supernumerary teeth to be erupted, when compared with only one quarter in other regional studies. This discrepancy may have resulted from the higher mean age in our study.

Most of the erupted supernumerary teeth were conical and most of the tuberculate were unerupted. This observation is in concordance with that of Foster,¹³ who stated that tuberculate supernumerary teeth rarely erupt. Similarly, Mitchell and Bennett²⁴ also postulated that teeth of tuberculate morphology were more likely to be retained than those of conical type, whereas Liu¹⁵ reported that tuberculate supernumerary teeth eruption may be delayed.

Only 2.2% of the supernumerary teeth were inverted and all of them were unerupted conical supernumerary teeth, a finding also evident in other published local,¹⁸ regional¹² and international studies.¹⁵

Supernumerary teeth are usually found to be single and unilateral and rarely multiple. In the present study, 78.3% patients had single supernumerary teeth, 21.6% patients had 2 supernumerary teeth and 2.9% had 3 or more, observations that support those of earlier studies.^{8,25}

Multiple supernumerary teeth are also found in the context of syndromes. We found 7.2% of patients had other associated dental and systemic anomalies, with cleft lip being the most frequent abnormality seen in 60% of patients who had concomitant anomalies.

The occurrence of multiple supernumerary teeth in the absence of a syndrome is very rare. All cases with 3 or more supernumerary teeth were associated with systemic abnormalities. Only one case with unilateral cleft lip had single supernumerary teeth. Only two cases with 16 and 19 supernumerary teeth occurring in the absence of systemic disorders have been previously reported.^{27, 28} Gunduz and Muglali²⁹ have similarly reported a case with 3 supplemental supernumerary teeth in whom an underlying syndrome was absent.

The most common site of supernumerary teeth was the premaxilla, where 60.1% occurred in the central incisor region and 28% in the midline.

The upper premolar and canine were equally affected with 4.3% in each, the lower central incisor in 2.7%, and the least to be affected being the lower premolar 0.5%. These findings coincided with those of other studies.^{11, 21, 23}

In marked contrast to other studies, however, we found no supernumerary teeth in the molar region, a finding also supported by Rajab and Hamdan, who reported a molar location in 0.5 %.

Supernumerary teeth in children are usually discovered incidentally by radiographic examination. Patients are usually asymptomatic although there is an effect on adjacent teeth⁹ and in spite of parental awareness of the child's appearance.

In our study, the most common defect was delayed eruption, followed by crowding and mechanical rotation/displacement, with only 11.8% lacking a defect. These findings coincide with Battikhi²³ and other studies. However, the results are at variance with Berrocal *et al*,²¹ who found a displacement of adjacent teeth to be more frequent, with reabsorption, and delayed or impossible eruption of the adjacent teeth to be the next most frequent entities. Follicular cyst was seen in 5.9% of the cases and this value is lower than that reported by Berrocal²¹ and Rajab and Hamdan.¹⁸

It is prudent to diagnose supernumerary teeth early to decrease or prevent the risk of complications. These lesions are diagnosed clinically and radiographically, and the choice of treatment varies according to type, location and the presence of a pathological process.

Asymptomatic supernumerary teeth with no effect on adjacent teeth can be observed regularly and be extracted in the event of a complication,⁶ or if they interfere with active orthodontic treatment.

Extraction of the offending supernumerary teeth was done for the majority of cases in our study since approximately three-quarters of patients needed orthodontic treatment and two-thirds had erupted supernumerary teeth. We believe that an earlier removal carries a better prognosis³⁰.

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