

Case Report

Sequential Supernumerary Teeth in Nonsyndromic Patients: Report of 3 Cases

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Abstract: *Supernumerary tooth/teeth (ST) are a well recognized clinical phenomenon defined as teeth that are additional to the normal complement. The purpose of this report was to describe 3 patients who developed multiple sequential ST. All patients were boys between 8 and 12 years old without significant medical history. In 2 cases, the ST were discovered while investigating the nonexfoliation of primary teeth, whereas in the other they were an occasional finding on a radiograph taken for orthodontic purposes. All patients were kept under close follow-up after treatment. The 3 patients collectively developed a total of 17 ST, with 9 found in a single patient, over a 5-year period. This article demonstrates the importance of clinical and radiographic follow-up of ST patients, regardless of age, family history, or systemic condition. (Pediatr Dent 2008;30:66-9) Received December 12, 2006 / Last Revision March 20, 2007 / Revision Accepted March 22, 2007.*

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Supernumerary tooth/teeth (ST) are a well-recognized clinical phenomenon defined as teeth that are additional to the normal complement.^{1,2} Several theories for their occurrence have been proposed, such as: (1) hyperactivity of the dental lamina; (2) the process of atavism; and (3) dichotomy of the tooth bud associated with environmental factors. In addition, familial tendency and racial influence may be related.³⁻⁶

ST are more common in the anterior maxilla, although they may develop in any dental arch region.¹ They have been reported in both the primary and the permanent dentition. ST may occur singly, multiply, unilaterally, bilaterally, and in one or both jaws. The reported prevalence of a single ST in the general Caucasian population for the permanent dentition ranges between less than 1% and 4%, whereas the prevalence in the primary dentition is said to be 0.3 to 0.8%.⁷ Multiple ST are less common than single ST and are even rarer in the absence of an associated systemic condition or syndrome.⁵ Their size and shape may resemble the group of teeth at the site in which they are found, or there may be little or no resemblance at all.

Regarding shape, ST are usually described as follows: (1) tuberculate (barrel-shaped, with more than 1 cusp or tubercle); (2) supplemental (identical to the morphology of teeth in the normal series); and (3) conoid (peg-shaped conical tooth).⁵ Although this is not clearly stated in the dental literature, ST have been reported as being either:

1. nonsequential (ie, all ST diagnosed in an individual moment, without further development of new teeth being verified)—these are: (a) either single or multiple; (b) frequently identified in childhood; and (c) most commonly in the anterior maxilla; or
2. sequential (ie, ST developing in a sequential manner, in different moments of a determined period of the patient's life). Few articles have described the sequential development of ST.^{2,9-12}

The goal of this article was to report 3 additional cases of sequential ST in nonsyndromic patients and to discuss its relevance and implications in clinical practice.

Description of cases

Case 1. An 8-year-old Caucasian boy was brought in by his parents to the authors' Pediatric Oral Surgery Service (POSS) of the Universidade Federal de Minas Gerais (UFMG) in 1987 with a chief complaint of a primary tooth that had not exfoliated. There was no significant medical or family history, and the patient was otherwise healthy. A periapical radiograph revealed 3 normally-orientated ST in the maxillary central incisors region. A panoramic radiograph did not reveal further

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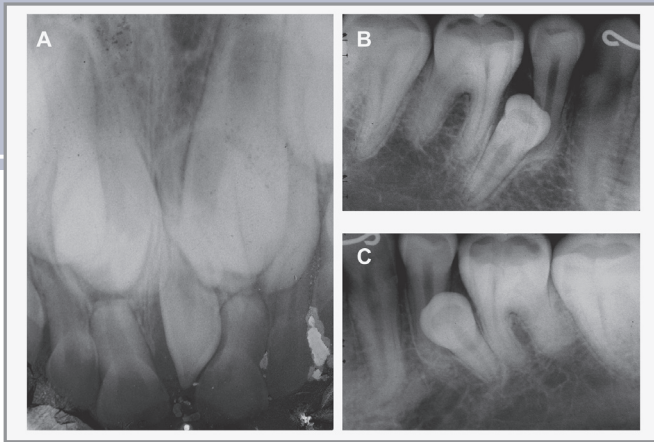


Figure 1. (A) Periapical radiograph revealing 3 bilateral supernumerary teeth (ST) in the maxillary central incisor region. (B and C) Fifteen years later, the patient developed 2 more bilateral ST in the mandibular premolar region.

alterations other than the ST already seen. Two teeth were tuberculate and had only the crown formed, whereas the other was conoid and completely formed (Figure 1a). The ST were surgically removed, since they were causing: (1) permanent tooth impaction; (2) delay in eruption; (3) diastema; and (4) prolonged retention of primary teeth. Fifteen years later (2002), the patient developed 2 more supplemental-shaped ST bilaterally in the mandibular second premolar region (Figures 1b and 1c). Both of them were completely formed. Surgery was once again the treatment of choice, due to impaction. The patient has been followed-up for 4 years with no recurrence or new formation of ST.

Case 2. An 8-year-old Caucasian boy with no significant medical or family history was referred to our POSS in October 1994 for evaluation of primary teeth that had not exfoliated.

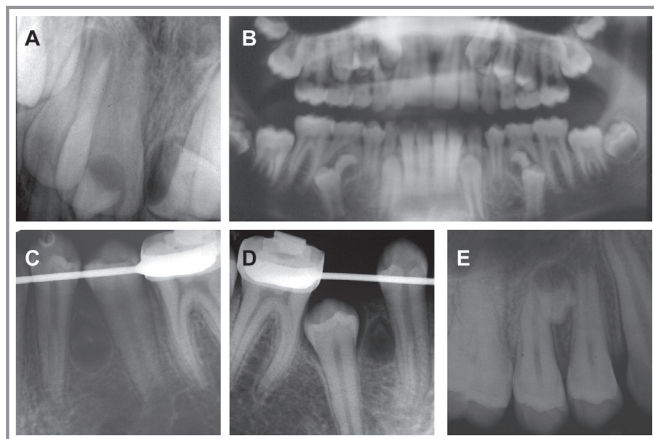


Figure 2. (A) Periapical radiograph showing 2 bilateral supernumerary teeth (ST) in the maxillary central incisor region. (B) Periapical radiograph showing 4 other ST, 3 years and 3 months later. (C, D, and E) Almost 2 years later, the development of a third generation of ST consisting of 3 supplemental teeth was seen on a panoramic radiograph.

A periapical radiograph showed 2 bilateral ST in the maxillary central incisor region. A panoramic radiograph did not reveal further alterations other than the ST already seen. The ST had a tubercular form and were normally-oriented (Figure 2a). Surgical excision was performed, since the ST were leading to permanent tooth retention. The patient was kept under periodic follow-up. Three years and 4 months later (February 1998), however, a panoramic radiograph showed 4 other ST: (a) 2 bilateral tubercular-shaped in the maxillary canine region; and (b) 2 bilateral ST in the mandibular second premolar region (Figure 2b).

The ST were surgically removed, because they were causing permanent teeth impaction. One year and 10 months later (December 1999), 3 additional ST were observed on periapical radiographs. Two teeth were found bilaterally in the mandibular premolar region, and 1 was observed on the maxillary premolar region (Figures 2c, 2d, and 2e). The teeth were surgically removed, since they were causing displacement of permanent teeth, and the patient was undergoing orthodontic treatment. The patient has been followed-up for 6 years without new formation of ST.

Case 3. In May 2004, a 12-year-old Caucasian boy without significant medical and family history was referred to the POSS for evaluation of ST that were found in a radiograph taken for orthodontic purposes. Periapical radiographs revealed 2 bilateral ST in the mandibular second premolar region. Also, it was observed that the mandibular right and left first premolars presented an unusual root bifurcation (Figures 3a and 3b). A panoramic radiograph did not reveal further alterations other than the ST and root bifurcation already seen. The ST were normally oriented and had supplemental shapes. The ST on the right side was removed, whereas the one on the left side was kept under close follow-up so that it could further develop and facilitate surgery. Two years later (April 2006), the patient

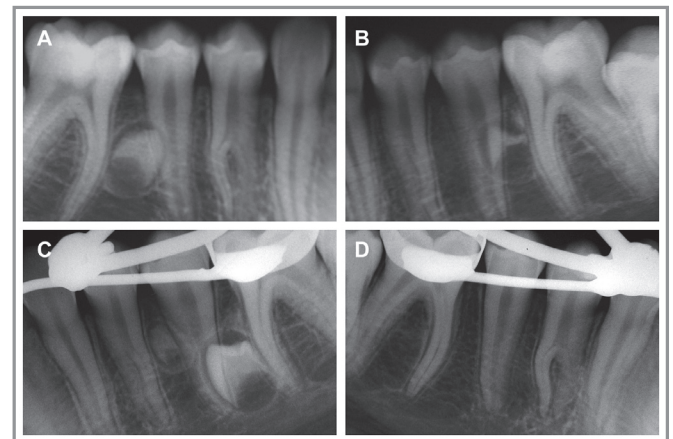


Figure 3. (A and B) Periapical radiographs revealing 2 bilateral supernumerary teeth (ST) in the mandibular premolar region. (C) Two years later, the patient developed 1 more ST in the mandibular premolar region, on the left side. (D) No recurrence or formation of new ST has been observed on the right side.

developed 1 more ST in the mandibular premolar region on the left side (Figure 3c). The patient is being followed-up for both ST on the left side for 18 and 2 months, respectively.

Although the ST first diagnosed is now developed enough to allow surgery, we are waiting for the smaller ST to further develop so that they can both be surgically removed. The ST will be extracted due to potential root displacement and resorption, and the patient's undergoing orthodontic treatment. No recurrence or formation of new ST has been observed on the right side (Figure 3d).

Discussion

A literature survey revealed few cases similar to the ones we report herein (ie, in which patients developed sequential ST over a determined period of time).⁹⁻¹² An important point, however, is that some of the previously reported cases might actually represent recurrent rather than newly developed ST, since the sequential ST developed in the same site of previous teeth. In the authors' cases, however, 2 distinct scenarios were seen:

1. In the first, the sequential ST developed in a different site from previous ST, showing that they were true, newly developed ST (this was seen in all 3 cases); and
2. In the second, the sequential ST developed in the same location as previously extracted ST, hence possibly being recurrent (case 2).

It has been stated that ST recurrence could be due to a portion of follicle reactivating, but this can not explain why in some cases new ST appeared in different areas. Another possible mechanism is the dental lamina not resorbing completely and reactivating at the time of crown completion of normal permanent teeth. Lastly, the crypts of the ST could have been present earlier, but were not detected in the previous radiographs.¹³

Multiple ST in the absence of an associated systemic condition or syndrome, such as in these cases, are especially infrequent compared to single ST.⁵ Rajab and Hamdan identified 35 (23%) nonsequential multiple ST among 152 cases.⁵ Similarly, Fernandez Montenegro et al verified that 23% of ST were multiple.⁷ Regarding age, previously reported cases include patients relatively old, with the majority being 15 years or older.^{14,15} By contrast, 2 of our patients were in their first decade of life when initially seen, with the oldest being 12 years old. In addition, we also observed that, as the patients grew older, the number of developing teeth decreased. This raises the question as to whether screening for ST should begin when patients are still in their first decade of life. There is considerable controversy, however, about: (1) when and how to screen; and (2) risks from unnecessary radiation.¹⁶

Almost all studies demonstrate a sex ratio in favor of males for nonsequential ST.⁵ Among cases of sequential ST, however, such a ratio does not seem to exist, with girls and boys being almost equally affected.^{2,8-12} In our cases, all 3 patients were boys. The most common location of nonsequential single ST is the premaxilla.⁵ On the other hand, nonsequential multiple

ST tend to occur more in the mandibular premolar area.¹³ In these cases, nearly all teeth were bilateral, with the mandibular premolar region being most affected, followed by the premaxilla region, considering all ST together. Sites least affected were the maxillary premolar regions, and canine regions. The latter are, in fact, considered a rare location for ST.¹⁷ When analyzing which teeth developed first, a more careful analysis of our cases showed that ST in the premaxilla developed earlier than those in the mandibular premolar region—a somewhat expected finding, since premolars develop a little later in life. Similarly, Solares and Romero observed that, in 12 cases of supernumerary premolars (24%), there was a previous history of another ST in the premaxilla region.¹³ Thus, their cases may also represent sequential ST. Other studies that reported patients with sequential development of ST found that the most common area was the mandibular premolar, whereas the premaxilla was not commonly affected. Also, in these studies all patients were already in their second decade of life when the ST were first identified.^{2,8,11,12}

By contrast, 2 of our patients developed their first ST in their first decade of life, only developing more teeth during the second decade of life. It is unclear whether the age difference between the authors' cases and other cases merely reflects the time at which diagnosis was achieved. Still, it seems that an epidemiological difference between previous studies and the authors' studies exists, since the authors detected a greater incidence of teeth in the premaxilla region. Genetics could have influenced this difference; however, none of our patients reported a family history of ST. Another influencing factor could be racial differences, but such interpretation is difficult when dealing with Brazilian patients, due to the high rate of miscegenation found in Brazil.¹⁸ In addition, an interesting finding in case 3 was the presence of premolars with unusual root bifurcations. Iyer found that only 39 of 959 first mandibular premolars had 2 roots (0.03%) and 62 among 932 (0.06%) mandibular second premolars with 2 roots.¹⁹ The fact that premolars are the transition teeth in the arch possibly account for these variations that simulate molars.¹⁹

ST may have no effect on the dentition, or the following clinical problems may be found: (1) failure of eruption; (2) displacement or rotation of permanent tooth; (3) crowding; (4) abnormal diastema or premature space closure; (5) dilacerations; (6) delayed or abnormal root development; (7) cystic formation; and (8) eruption into the nasal cavity.⁵ The authors observed some of these findings either as a chief complaint or following clinical examination. Whenever ST are discovered, a decision has to be made whether they should be removed or monitored; importantly, the timing of surgical removal is still a controversial issue.¹³

Considering that removal of ST may be lead to complications affecting adjacent teeth, it should be determined if the risks of surgery outweigh the benefits of removal. If surgery is too risky, the teeth may be left "in situ" and monitored clinically and radiographically.^{8,20} In our cases, the ST were leading to

problems; thus, we opted to remove them. In addition, it has been stressed that even following surgery, long-term monitoring should be performed.^{8,13} Our cases clearly illustrate the importance of periodic follow-up. Nevertheless, dentists should keep in mind that a patient's radiation exposure should be as low as possible. It has been proposed that panoramic radiographs should be performed every 3 to 5 years, depending on the patient's history, number, and position of ST. Whenever root resorption is likely to occur, the area in question needs to be radiographed every 6 to 12 months.⁸

In conclusion, we reported 3 cases of sequential ST affecting nonsyndromic patients. This article demonstrated the importance of clinical and radiographic follow-up of patients that develop ST, regardless of age, family history, or systemic condition.

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