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Multiple supernumerary teeth in the maxillary canine and mandibular premolar regions: a case in the postpermanent dentition

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Background. A supernumerary tooth is an extra tooth above the normal number, of which approximately 90% occur in the premaxillary region and show rudimentary forms of crown morphology. Most cases occur singly, with bilateral occurrence in the maxillary canine regions very rare in children with no other associated diseases or syndromes.

Case report. A case of a 14-year-old boy with bilateral supernumerary teeth with normal crown shapes in both the maxillary canine and mandibular premolar regions. The supernumerary teeth in the maxilla were diagnosed at 12.2 years of age and in the mandible at 14.1 years of age.

Conclusion. Four supernumerary teeth in the maxillary and mandibular canine-premolar region is a rare finding.

Introduction

A supernumerary tooth is defined as an extra tooth that develops in addition to the normal number found in dentition[1,2]. Those seen in the permanent dentition are divided into four different types: conical, tuberculate, supplemental and odontome[3]. Studies of Caucasian populations have indicated a prevalence ranging from 0.2% to 0·8% in the primary dentition, and from 1.5% to 3.5% in the permanent dentition, with a male-to-female ratio of approximately 2:1[4]. Supernumerary teeth usually occur singly, although the occurrence of multiple supernumerary teeth (i.e. three or more) has been found in 4.6% of reported cases[5]. Approximately 90% of all supernumerary teeth occur in the premaxillary region, 93% of which are in the central incisor region, with 25% of those located in the midline. Of the other 10%, about 4% and 1.5% are located in the mandibular premolar and maxillary canine regions, respectively[5]. Although there are many reports of bilateral supernumerary teeth, cases with multiple supernumerary teeth in the maxillary canine and mandibular premolar regions are extremely rare. This paper describes a case of bilateral supernumerary teeth located in the maxillary canine and mandibular premolar regions in a patient with permanent dentition, and discusses the aetiology of this condition.

Case report

A 12-year-old boy with delayed exfoliation of the primary canines was referred to the Pedodontic Clinic of Osaka University Dental Hospital, Osaka, Japan, by a general dental practitioner. Orthopantomogram (OPT) images identified supernumerary teeth with a normal crown shape in the maxillary bilateral canine regions at the age of 12.2 years (Fig. 1b), which was in contrast to an OPT taken by the general dental practitioner that did not show any supernumerary teeth when the subject was 6.3 years of age (Fig. 1a). An axial view radiograph showed that the bilateral supernumerary teeth were located in the palatal region (Fig. 2). Medical examinations eliminated the possibilities of cleft lip/palate, cleidocranial dysplasia, oral–facial–digital syndromes, Hallerman–Streiff

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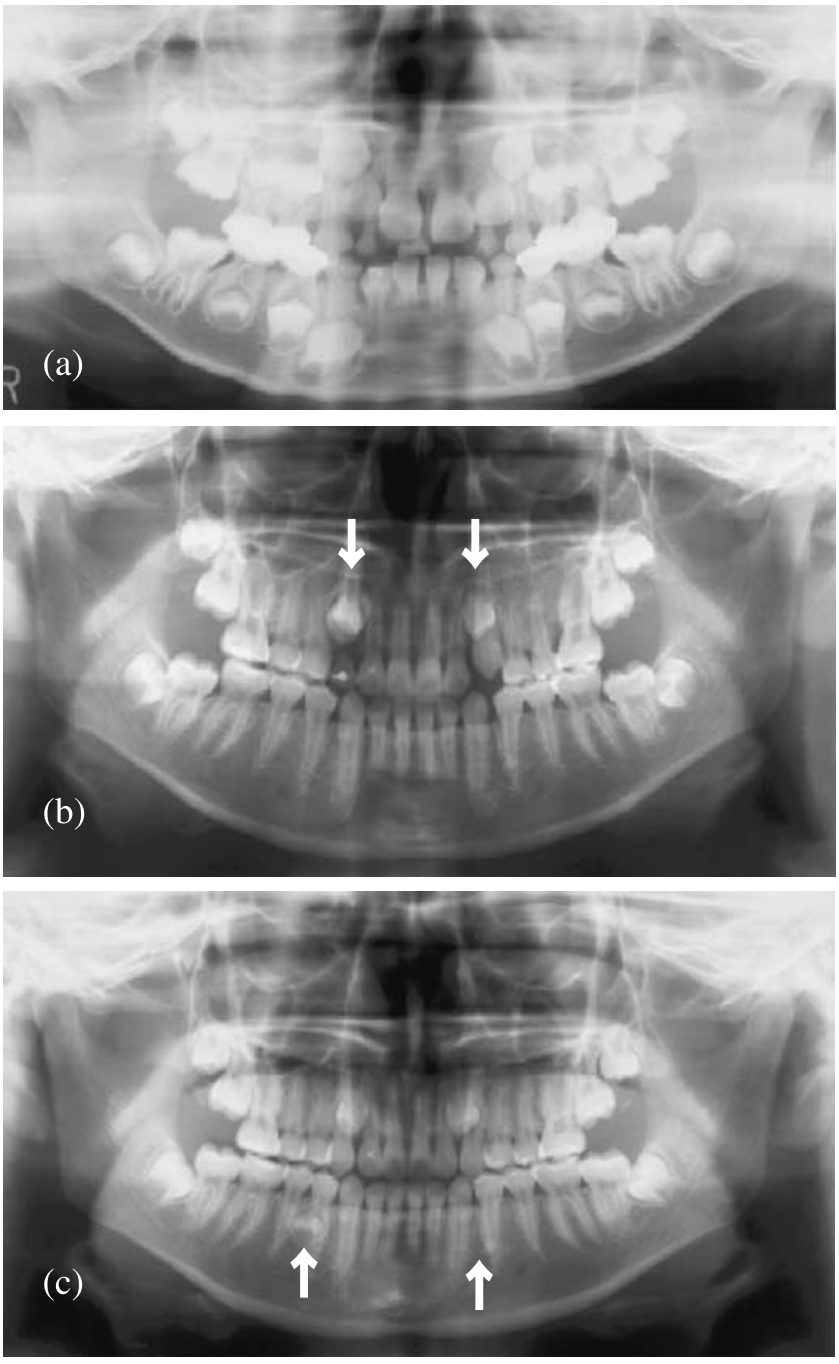

Fig. 1. Longitudinal changes seen in orthopantomogram images: (a) No supernumerary teeth were observed at 6.3 years of age. (b) Supernumerary teeth (arrows) were observed in the maxillary bilateral canine regions at 12.2 years of age. (c) New supernumerary teeth (arrows) were observed in the central root section between the right lower first premolar and second premolar, and on the apex side one-third portion of the left lower first premolar at 14.1 years of age.

syndrome, and Gardner syndrome, which are well known to be associated with multiple supernumerary teeth[6]. Furthermore, based on results of oral consultation, none of the subject's immediate family had supernumerary teeth. The left maxillary canine later emerged into the patient's oral cavity at 12.3 years of age, and at the same time, the right maxillary primary canine was extracted. When the bilateral canine region was examined with an OPT at 14.1 years, a supernumerary tooth with a normal crown shape was found in the middle of the root between the lower right first and second premolars (Fig. 1c). A closer examination showed that another supernumerary tooth was located in the area around the apex of the left lower first premolar. The bilateral maxillary canines completely erupted at 14.2 years of age, although neither of the supernumerary teeth erupted into the oral cavity.

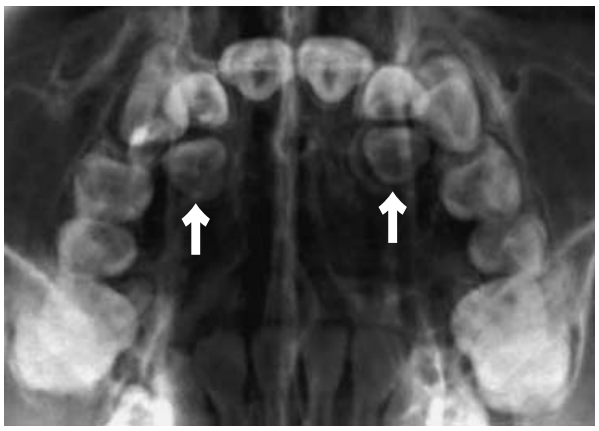

Fig. 2. Axial view radiograph: supernumerary teeth (arrows) can been seen on the palatal side of the canines in this axial view projection.

The dental age of the patient was calculated by assessing the stages of tooth formation, as seen on OPT images taken at 6.3, 12.2 and 14.1 years of age, according to the method described by Haavikko[7]. The reliability of this method for Japanese subjects was proven by analysis of OPT findings for 100 subjects with normal eruption times in the authors' previous study[8]. Table 1 shows the dental age of the present patient at each examination, which was calculated based on the developmental stage of all teeth, except for those that were supernumerary. There were no significant differences between chronological age and dental age of the subject at any of the examinations. In addition, the dental ages of the bilateral maxillary canines were also shown to be consistent with chronological age at each examination. In contrast, the dental ages of both supernumerary teeth in the maxillary canine regions were 4.6 years at the chronological age of 12.2 years and 7.0 years at 14.1 years, when the supernumerary teeth were considered to be maxillary permanent canines.

Discussion

According to Rajab and Hamdan, who made a study of 152 subjects with a total of 202 supernumerary teeth[5], the frequency of four supernumerary teeth in a single subject was 1.3%, while that of supernumerary teeth with a normal crown shape was 6.9% in their sample. Furthermore, of the 202 supernumerary teeth reported, three (1.5%) were located in the maxillary canine region and eight (4%) in the mandibular premolar region. Thus, the present case of four supernumerary teeth in the maxillary canine and mandibular premolar regions appears to be extremely rare. Becker *et al.*[9] reported a case of multiple supernumerary teeth, which were located anteriorly and posteriorly in the maxillary and mandibular regions of a 12-year-old patient. In the above case, the supernumerary teeth were present in the canine-premolar regions and developed after removal of a maxillary midline supernumerary tooth at the age of 8 years. Becker *et al.*[9] thought that the condition might be an example of postpermanent dentition development. In the present patient, the timing of the appearance of the supernumerary teeth was also unusual, since those in the maxillary canine and mandibular premolar regions were found at 12.2 and 14.1 years of age, respectively, whereas they were not observed in OPT images taken at 6.3 years and 12.2 years of age, respectively.

The aetiology of supernumerary teeth remains unclear, although several theories have been presented, with hereditary factors believed to

Table 1. Dental age of maxillary canines and supernumerary teeth in the maxillary canine regions.

Chronological age (years)	Dental age of the subject[a]	Dental age of the teeth[b]			
		3⌋	⌊3	3′⌋[c]	⌊3′[c]
6.25	6.81 ± 0.39	7.0 (R1/4)	7.0 (R1/4)	ND	ND
12.17	12.73 ± 0.82	12.3 (Rc)	12.3 (Rc)	4.6 (Ri)	4.6 (Ri)
14.08	15.08 ± 1.69	13.6 (Ac)	13.6 (Ac)	7.0 (R1/4)	7.0 (R1/4)

[a]Dental age was calculated by evaluating tooth formation stage for all the tooth germs, except those of the supernumerary teeth.
[b]Tooth formation stage was determined according to the definition described by Haavikko[7]. Root formation stage; Ri, initial root formation; R1/4, root length 1/4; Rc, root length complete; Ac, apex closed. "ND" indicates that the tooth germ could not be detected in orthopathomograms. Parentheses indicate the tooth formation stages of the maxillay canine and supernumerary teeth.
[c] 3′⌋ and ⌊3′ indicate the supernumerary teeth found in the right and left canine regions, respectively.

be important because of reports of occurrence within the same family[10]. In this case, genetic factors were excluded because no other family members had the condition. A dichotomy of the tooth bud has also been suggested as a possible aetiological factor in the development of supernumerary teeth, and one study speculated that the tooth bud splits into two equal or differently sized parts during development, which results in two teeth of equal size, or one normal and one dysmorphic tooth[5]. However, such a process is not compatible with the findings of the present case since the supernumerary teeth developed much later than their corresponding permanent teeth.

In the present patient, the dental ages of the maxillary permanent canines were nearly in accordance with the chronological age of the subject. The dental ages of both supernumerary teeth in the maxillary canine regions, however, were 4.6 years at the chronological age of 12.2 years and 7.0 years at 14.1 years, when the supernumerary teeth were considered to be maxillary permanent canines. According to a report by Schour and Massler[11], formation of the canine crown is completed at approximately 10–11 months of age in the primary dentition and 6–7 years of age in the permanent dentition, while it takes 5–6 years from completion of the primary canine crown to completion of the permanent canine crown. In this patient, crown formation of the supernumerary teeth in the maxillary canine regions was completed at around 12 years of chronological age, and therefore, approximately 5–6 years was needed from the completion of the permanent canine crowns to the completion of the supernumerary tooth crowns. In addition, the supernumerary teeth showed a normal crown shape. These findings suggest that the supernumerary teeth in this case may have formed as a result of local hyperactivity in the dental lamina. The lingual extension of additional tooth buds from permanent maxillary canines may lead to the development of supernumerary teeth with a normal shape since the tooth bud of a primary tooth leads to its permanent successor. Thus, the present supernumerary teeth in the maxillary canine regions may have been canines in the postpermanent dentition.

Most clinical complications associated with supernumerary teeth are related to interference with normal eruption and positions of the adjacent teeth[1]. Such interference can result in retarded eruption and impaction, as well as displacement of the adjacent teeth when they are impacted. In addition, supernumerary teeth may cause malalignment of the dentition, and when they erupt, be cosmetically undesirable. If any of these complications are found during an examination, the supernumerary teeth should be removed. In the present case, the supernumerary teeth were found at the palatal sides of the maxillary canine regions in the axial view projection, and are expected to erupt naturally into the oral cavity without inducing displacement of the adjacent teeth. The authors will continue to observe the patient until their eruption, after which they intend to remove them.

What this case report adds

- This is a report of an unusual case of supernumerary teeth in the maxillary bilateral canine region as well as the mandibular bilateral premolar region.

Why this paper is important for paediatric dentists

- Although the appearance of supernumerary teeth in postpermanent dentition is rare, clinicians should be aware of the possibility of this phenomenon when conducting periodical examinations.

References

1 Primosch RE. Anterior supernumerary teeth – assessment and surgical intervention in children. *Pediatr Dent* 1981; **3**: 204–215.

2 Dummett CO, Jr. Anomalies of the developing dentition. In: Pinkham JR (ed.). *Pediatric Dentistry: Infancy Through Adolescence*, 3rd edn. Philadelphia, PA: W. B. Saunders, 1999: 43–45.

3 Garvey MT, Barry HJ, Blake M. Supernumerary teeth – an overview of classification diagnosis and management. *J Can Dent Assoc* 1999; **65**: 612–616.

4 Winter GB. Anomalies of tooth formation and eruption. In: Welbury RR (ed.). *Paediatric Dentistry.* Oxford: Oxford University Press, 1999: 255–256.

5 Rajab LD, Hanmdan MAM. Supernumerary teeth: review of the literature and a survey of 152 cases. *Int J Paediatr Dent* 2002; **12**: 244–254.

6 Soames JV, Southam JC. Disorders of development of teeth. In: Soames JV, Southam JC. (eds). *Oral Pathology*, 2nd edn. Oxford: Oxford University Press, 1993: 3–15.

7 Haavikko K. The formation and the alveolar and clinical eruption of the permanent teeth. An

orthopantomograhic study. *Suom Hammaslaak Toim* 1970; **66**: 103–170.
8 Nakano K, Matsuoka T, Takahashi A, Matsumura M, Sobue S, Ooshima T. Delayed development or congenital absence of a single first permanent molar in Japanese child patients. *Int J Paediatr Dent* 1999; **9**: 271–276.
9 Becker A, Bimstein E, Shteyer A. Interdisciplinary treatment of multiple unerupted supernumerary teeth: report of a case. *Am J Orthod* 1982; **81**: 417–422.
10 Marya CM, Kumar BR. Familial occurrence of mesiodentes with unusual findings: case reports. *Quintessence Int* 1998; **29**: 49–51.
11 Schour I, Massler M. Studies in tooth development: the growth pattern of human teeth. *J Am Dent Assoc* 1940; **27**: 1778–1793.