Nonsyndromic Multiple Mandibular Supernumerary Premolars: A Case Report

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ABSTRACT

Supernumerary teeth are generally asymptomatic and may not become visible radiographically until a patient's normal teeth have erupted. Moreover, diagnosing, treating, and following up supernumerary teeth appropriately with radiographic images is important. In this case report, we present radiographic images, including three-dimensional computerized tomography films, of a 13-year-old patient with four nonsyndromic mandibular supernumerary premolars, and the surgical treatment.

(J Dent Child 2010;77:99-101)

Received March 9, 2009; Last Revision April 23, 2009; Revision Accepted April 24, 2009.

KEYWORDS: SUPERNUMERARY TEETH, MANDIBULAR PREMOLARS, RADIOGRAPHIC IMAGES, SURGICAL TREATMENT

Supernumerary teeth are defined as teeth in excess of the normal dental formula,[1] and are a clinical phenomenon. The reported prevalence of hyperdontia of the permanent dentition ranges from approximately less than 1% to 4% in the general Caucasian population, whereas a frequency greater than 3% has been reported in Mongolian racial groups.[2] The most common supernumerary teeth, listed in order of frequency, are as follows:

1. maxillary midline supernumeraries;
2. maxillary fourth molars;
3. maxillary paramolars (rudimentary supernumeraries that develop buccally or lingually to the maxillary molars);
4. mandibular premolars;
5. maxillary lateral incisors;
6. mandibular fourth molars; and
7. maxillary premolars.[3]

The clinical significance of supernumerary teeth is in their recognition and correct management and treatment. Generally, supernumerary teeth are asymptomatic and discovered in full-mouth periapical radiographs—either a panoramic radiograph or a complete periapical series of all new patients.[4,5]

Sometimes, however, these films cannot provide complete information on the 3-dimensional (3D) relationship between supernumerary teeth, or ectopically impacted teeth, and adjacent structures.[6] For diagnosis and planning treatment, computed tomography (CT) provides more useful information than conventional radiographs in order to evaluate the root relationships of 2 supernumerary teeth located palatally to the permanent maxillary central incisors.[7]

The purpose of this report was to describe a case of 4 supernumerary teeth found bilaterally in the mandibular premolar region with three-dimensional computed tomography images and their surgical treatment.

CASE DESCRIPTION

A 13-year-old Japanese boy was referred by his general dental practitioner because of the prolonged presence of primary teeth, impacted permanent teeth, and supernumerary teeth in the mandibular premolar region. No major relevant medical or family history was reported, and the patient was otherwise healthy. The clinical examination showed that the patient had late mixed dentition. His panoramic radiographs revealed the presence of all permanent teeth as well as 4 supernumerary premolars in the mandibular premolar region (Figure 1a).

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An occlusal radiograph showed that the supernumerary teeth were lingual to the primary molars (Figure 1b). CT was performed parallel to the mandible's occlusal plane with a slice thickness of 1 mm, and 3D reconstruction of the images was conducted (Figures 1c and d). 3D-CT showed premolars of normal form and at the normal stage of development for a patient of this age, immediately apical to the primary molars. In addition, 4 enamel caps of supernumerary teeth were lingual to these impacted premolars bilaterally.

After surgically removing 3 primary mandibular molars bilaterally (Figure 1c), 1 second premolar erupted in the left mandible. In addition, 2 supernumerary teeth in the right mandible (Figure 1d) were removed surgically and 2 premolars erupted in the normal position.

The patient was satisfied with the eruption of the 3 premolars and refused further surgical extraction of the supernumerary teeth in the left mandible (Figure 1d). He was referred back to his general dental practitioner for follow-up.

DISCUSSION

The presence of 4 bilateral supernumerary teeth in the mandible is rare. Premolars account for nearly 9% of all supernumeraries, with mandibular teeth representing 7% and maxillary teeth 2%.[3] Moreover, the occurrence of multiple supernumerary teeth is less common than single supernumerary teeth and is even rarer in the absence of an associated systemic condition or syndrome, such as cleidocranial dysplasia or Gardner's syndrome.[2] Single supernumeraries occur in 72% to 77% of all cases, double supernumeraries in 18% to 27% of cases, and 3 or more supernumeraries in 1% to 5%.[2,8]

In this case, the supernumerary teeth were not related to a syndrome or any associated systemic condition and resembled premolars morphologically (Figure 1d). Several hypotheses have been proposed to explain supernumerary teeth, including dental lamina hyperactivity,[9] splitting of the tooth bud,[10] and a combination of genetic and environmental factors.[11] Sex-linked inheritance may explain their predominance in males over females.[2]

The ability to locate supernumerary teeth accurately and determine their relationship with adjacent teeth and other anatomical structures in the area is important in clinical dentistry, especially when extraction of the supernumerary teeth or orthodontic intervention is indicated. To minimize harm to adjacent tooth roots and trauma to surrounding tissue, determining the best surgical approach is of utmost importance. Traditionally, periapical, occlusal, and panoramic radiographs have been used to help make these decisions.

In cases with multiple impacted teeth or severe overlapping of impacted teeth, determining the relationships of teeth and the surrounding structures in 3D space is very difficult.[6] CT is the best diagnostic imaging method currently available; it provides higher resolution for hard tissues and determines the accurate location of retained teeth and their relationship to adjacent tissues.[12] Nevertheless, dentists should minimize the patient's radiation exposure.[13]

In this case, removal of the supernumerary teeth facilitated eruption of the premolars on the right mandible,

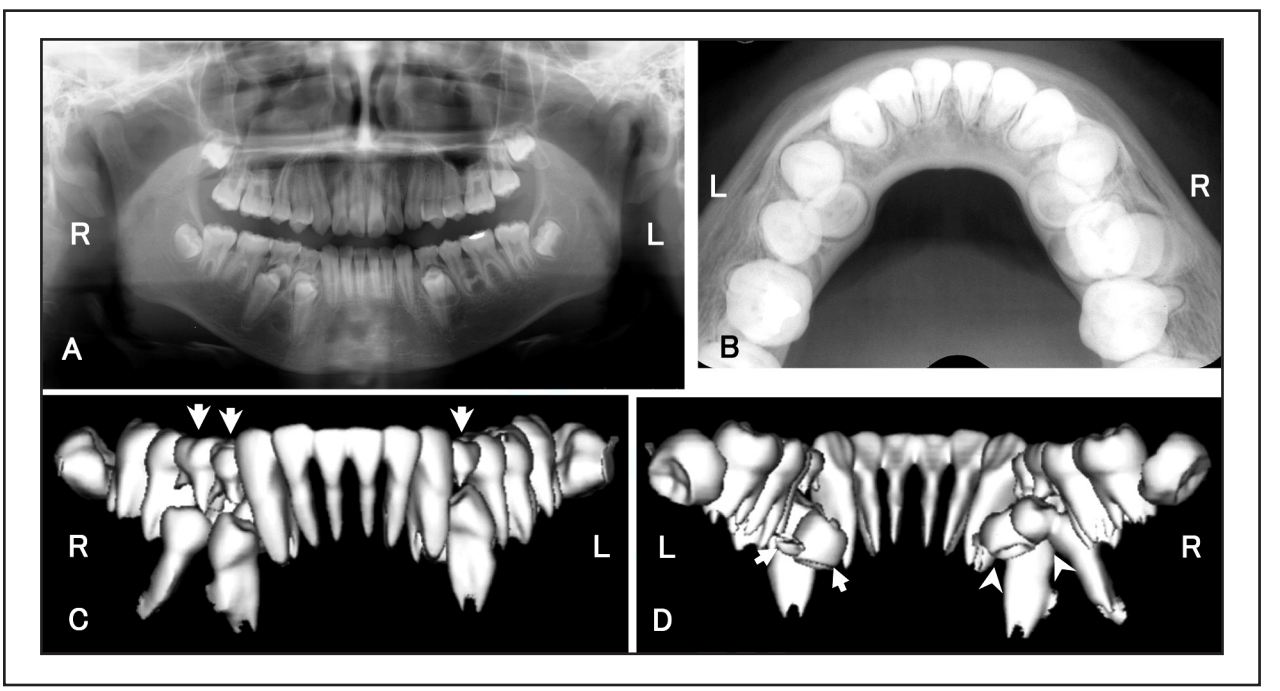

Figure 1. (a) The panoramic radiograph. (b) Occlusal radiograph of the mandible. (c) A labial view of the three-dimensional (3D) mandibular image. The primary molars were extracted (arrows). (d) A lingual view of the 3D mandibular image. Four supernumerary teeth were lingual to impacted premolars. Two supernumerary teeth were extracted (arrowheads), and the other 2 supernumerary teeth were left in situ (arrows).

while removal of a primary molar facilitated eruption of a premolar on the left mandible; 2 supernumerary teeth were left in place. The patient was satisfied with the eruption of 3 premolars and did not desire surgical removal of the remaining supernumerary teeth on the left mandible. The 2 supernumerary teeth were not associated with cyst formation or the resorption of adjacent teeth. In general, extraction of supernumerary premolars is the recommended treatment choice, but the timing of surgical removal is controversial. If supernumerary teeth are close to the inferior alveolar nerve, increasing the risk of surgery, the teeth should be left in situ and monitored clinically and radiographically.[14]

Dentigerous cysts associated with supernumerary teeth are rare and constitute 5% to 6% of all dentigerous cysts.[15] The vast majority, approximately 90%, are associated with a maxillary mesiodens. Regarding root resorption, there is one documented case of a supernumerary premolar causing rapid mesial root resorption of the first permanent mandibular molar with subsequent early loss of this permanent molar.[16] In addition, several studies[17-19] have reported the recurrence of supernumerary premolars after surgical removal. A possible mechanism for recurrence is that the crypts of additional supernumerary premolars were present earlier, but were not detected in the original radiographs.[1]

In conclusion, we reported on a nonsyndromic patient with 4 supernumerary teeth in the mandibular premolar region bilaterally and presented the radiographic images. The patient had 3 primary molars and 2 supernumerary teeth on the right mandible removed surgically. Two other supernumerary teeth in the left mandible were left in place. Continuing clinical and radiographic follow-up of the patient is important.

ACKNOWLEDGMENT

We thank Mr. Hideki Kitamori, Department of Radiology and Cancer Biology Nagasaki University Hospital of Medicine and Dentistry, for helpful suggestions.

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