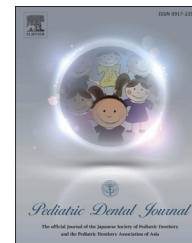




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Case Report

Isolated bilateral macrodontia of the mandibular second premolars with familial multiple supernumerary teeth: A case report

Akira Okuno, Mitsuro Tanaka*

Iwate Medical University, Pediatric Dentistry, Morioka, Iwate, Japan

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ABSTRACT

Background: Isolated macrodontia is a rare morphological abnormality that can cause malocclusion and malalignment of the dental arch. Only 17 cases of isolated macrodontia of the mandibular second premolars have been reported. We recently experienced an additional case and reported.

Case report: Although its etiology remains unknown, the involvement of genetic factors was hypothesized as the patient's father and younger brother each had two supernumerary teeth, and his other teeth were larger than average.

Conclusion: The macrodont affects the surrounding area because of its larger size by disturbing the dental alignment and development of adjacent teeth. A treatment strategy is discussed with reference to the reported cases.

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1. Introduction

The reported prevalence of macrodontic permanent teeth is 0.03–1.9% [1–3] and that of macrodontic mandibular second premolars is 0.7%, which is the highest among permanent teeth [2]. Depending on their size and morphology, macrodonts can create a variety of functional and esthetic problems that may require prosthetic, surgical, or orthodontic treatment. To date, only 17 cases of isolated macrodontia of the second premolars have been reported [4–19]. No systematic investigation regarding the pathological causes of macrodontia has been reported.

The reported incidence of supernumerary teeth in the permanent dentition is 1.5–3.5%, and the male-to-female

ratio is approximately 2:1 [20]. The occurrence rates of single, double, and three or more supernumerary teeth are 76–80%, 12–23%, and less than 1%, respectively. Genetic components are thought to be involved because siblings and twins of those with this condition have greater chances of being affected [21].

This is a case report of a patient with nonsyndromic bilateral macrodontia of the mandibular second premolars combined with familial multiple supernumerary teeth.

2. Case report

A boy aged 7 years 8 months was referred to our hospital by a general dentist regarding maxillary central supernumerary

* Corresponding author. Iwate Medical University, Pediatric Dentistry, 19-1, Uchimaru, Morioka, Iwate 020-8505, Japan.

E-mail address: mtanaka@iwate-med.ac.jp (M. Tanaka).

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teeth. The X-ray examination revealed three supernumerary teeth, two inverted and one orthodromic. Additionally, bilateral macrodonts were found by chance in the panoramic X-ray examination (Fig. 1).

Both his father and younger brother each had two supernumerary teeth: one was orthodromic and the other was inverted in both cases. The patient had no congenital disease and no history of serious illness. His height and body weight were within the normal ranges for the Japanese population. The sizes of the macrodonts and other teeth are provided in Table 1, along with the standard mesiodistal lengths for Japanese boys [22,23]. The sizes of unerupted teeth were measured on a cone beam computed tomography image that was taken to diagnose the macrodont at the age of 10 years 6 months (Fig. 2). The respective mesiodistal lengths of the left and right mandibular second premolar crowns were 2.1 and 1.8 times larger than the average size for Japanese boys. Most of the other teeth crowns in this patient also had larger mesiodistal lengths. Specifically, the maxillary left second premolar and mandibular first premolars were three standard deviations larger than average.

At the age of 7 years 9 months, the three supernumerary teeth were extracted without any problems. At 20 months after the extraction, the maxillary right lateral incisor started to erupt, whereas the right central incisor had not erupted 18 months after that; therefore, an extrusion was performed.

Regarding the macrodonts, we consulted oral surgeons concerning the appropriate timing and method of extraction. They suggested waiting until the root of the first premolar had

formed to avoid accidental injury to the tooth buds. Therefore, we decided to observe the eruption movement of the first premolars. Another option was to observe whether space for eruption of the macrodonts occurs with growth because in many reports, the macrodonts erupted to occlusion and could be used accordingly, although the occlusal relationship with the maxillary tooth was not ideal [5,9,10,14,15,17].

However, at the age of 11 years 5 months, when the mandibular first premolar had erupted, the space for eruption of the macrodontic second premolars was judged to be inadequate (Fig. 3); as we believed that the eruption of these teeth would disturb the dental arch alignment, we decided to extract them under general anesthesia.

The operation was conducted carefully to preserve the second primary molar to prevent mesial inclination of the first molars and to avoid disturbing the inferior alveolar nerve. Although the inferior alveolar canal was not very close to the macrodonts, the teeth were split into pieces at the time of extraction to preserve the root of the second primary molar.

3. Discussion

Seventeen past case reports of macrodontia of the mandibular second premolars [4–19] are summarized in Table 2. Out of the 17 cases, 15 were bilateral, and no sex difference was observed. Most patients were aged between 10 years and 14 years, which is the age when the second primary teeth exchange with the successive second premolar. Erupted macrodonts can cause disharmony in the dental alignment depending on their crown size. When they are not very large, no active treatment is required [5,9,14,15,17]; even when some disharmony in the dental arch exists, it is not a serious problem for patients or their parents who usually select preservation of the teeth [10,19].

The extraction of an erupted or impacted macrodontic second premolar means early loss of a permanent tooth, and suitable care is required to prevent inclination of the adjacent teeth. The treatment plan depends on whether orthodontic treatment will be selected. In the past, orthodontic treatment after macrodont extraction was usually selected [11,12,16–18]. When prosthodontic treatment is the plan of choice, inclination of the adjacent teeth should be prevented by a space maintainer, such as a lingual arch appliance or removable appliance, or by preserving the second primary molar to the extent possible until permanent prosthodontic treatment, including implant therapy, is performed. In our patient, prosthodontic treatment was selected, as the mesial movement of the mandibular first molars without mesial inclination was anticipated to be very difficult and the patient had very high caries activity, which contraindicates the wearing of orthodontic appliances.

Regarding the timing of macrodont extraction, we waited until the root of the adjacent first premolar had formed, following the oral surgeon's advice. Although we believed this to be a safer decision, resorption of the preceding second primary molar root started, making longer use of this tooth as a space maintainer difficult. The timing of extraction is an important concern in the treatment of macrodontia.

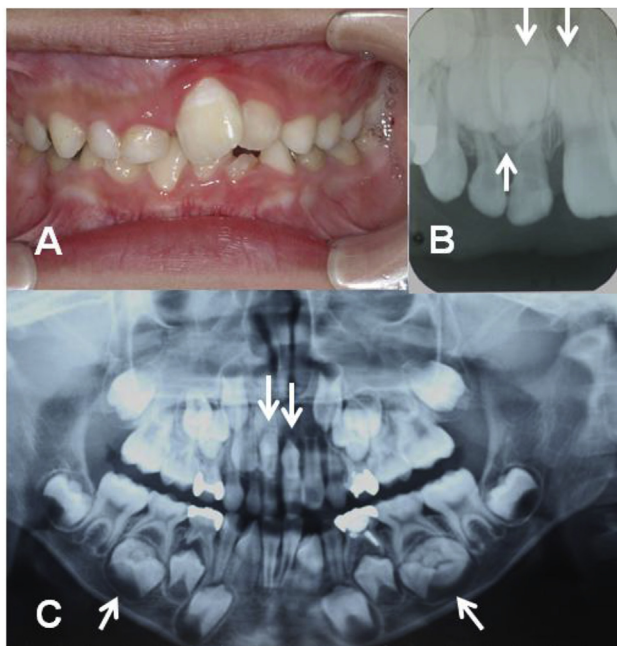


Fig. 1 – (A) Oral photograph; (B) dental; and (C) panoramic X-rays obtained at the first visit. Arrows indicate the positions of the two macrodonts and three supernumerary teeth. The macrodonts were present bilaterally in the mandibular second premolar area. One supernumerary tooth was orthodromic and the other two were inverted.

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