

## Radiographic monitoring of healing process of buccal bifurcation cysts after marsupialization: Two cases

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### ABSTRACT

This report is to show healing process of two cases of buccal bifurcation cyst (BBC) developed from the mandibular deciduous second molars. Extracting the involved deciduous teeth led to marsupialization of the cysts and promoted eruption of the associated successors without orthodontic force. The cyst-associated premolars in the two cases erupted faster than the premolars on the contralateral noncyst side. The cysts were completely filled with normal bone. The monitoring radiographs showed bone healing, root formation, and path of eruption of the associated teeth after marsupialization of BBC. (*Korean J Oral Maxillofac Radiol* 2004; 34 : 191-4)

**KEY WORDS** : Cysts; Tooth Eruption; Radiography, Panoramic; Radiography, Dental

Buccal bifurcation cyst (BBC) occurs on the buccal aspects of the roots of the partially or newly erupted permanent molar. The mandibular first molar is the most common location of a BBC, followed by the second molar.<sup>1</sup> The mandibular deciduous second molar can be the tooth of origin of a BBC.<sup>2</sup> The distinguishing features usually include the young age of the patient between the ages of 6 and 10 years, the affected mandibular molar region, the vitality of the tooth pulp, and the radiographic findings of continuity of the apical lamina dura and buccal displacement of the dental crown of the involved tooth.<sup>1-3</sup> The Diagnosis of a BBC relies entirely on clinical and radiographic information, because the histology of BBC is non-specific and reveals non-keratinized stratified squamous epithelium.<sup>1,4</sup>

Considering the young age of the patients of BBCs, marsupialization should be used when there is a possibility that enucleation might cause the devitalization of healthy adjacent teeth. It also should be used to erupt a cyst-associated impacted tooth if enough space for eruption exists.<sup>5-8</sup>

The purpose of this report is to describe two cases of BBC developed from the buccal bifurcations of mandibular deciduous second molars and to show the healing process of BBCs and the eruption of the cyst-associated, displaced premolars after marsupialization.

### Case report

#### 1. Case 1

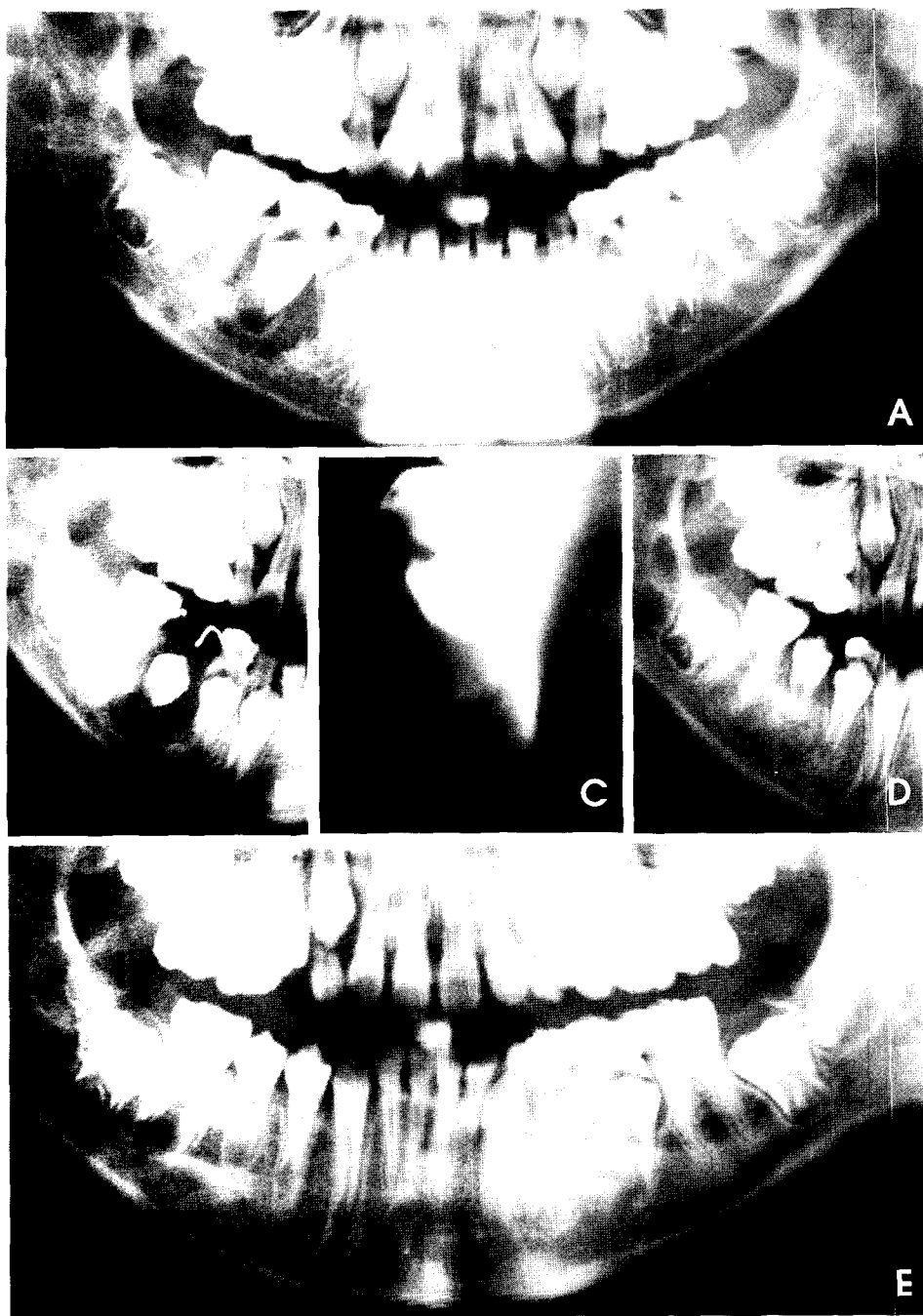
A 10-year-old girl complaining somewhat hard buccal swelling of the right posterior mandible was referred from a local dental clinic to the department of Oral & Maxillofacial Surgery of Chonnam University Hospital. The involved area, according to the patient's mother, underwent a slow expansion for a month. The swelling extended from the right mandibular deciduous first molar to the first molar.

A periapical and a panoramic radiographs revealed a well-defined radiolucency associated with the right mandibular deciduous second molar. The occlusal radiograph showed a buccal cortical expansion. The bone destruction appeared to be beyond the lower limit of the developing right mandibular second premolar. The developing right mandibular second premolar tilted slightly buccally and mesially, compared to the contralateral second premolar. The developing right mandibular first premolar was mesially displaced. The fluid aspirated was thin and straw-colored (Fig. 1A).

Under a local anesthesia, the right mandibular deciduous second molar was extracted. An obturator was applied and it also acted as a space maintainer.

Six weeks later, the panoramic radiograph showed the upward movement of the developing right mandibular second premolar and the distal movement of the right mandibular first premolar. The cystic radiolucency decreased. A tomograph at this time still showed buccal tipping of the right mandibular

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**Fig. 1.** A, Radiograph at the first visit. A well-defined radiolucency was associated with the right mandibular deciduous second molar. The right mandibular second premolar tilted slightly buccally and mesially. The developing right mandibular first premolar was mesially displaced. B-C, After 6 weeks. The second premolar moved superiorly and the first premolar distally. The cystic radiolucency decreased. The second premolar still tilted buccally. D, After 7 months. The right mandibular second premolar seemed to change its buccal angulation into normal upright position. E, After 11 months. The right mandibular premolars erupted to the occlusal plane, while the teeth of the contralateral side did not erupt.

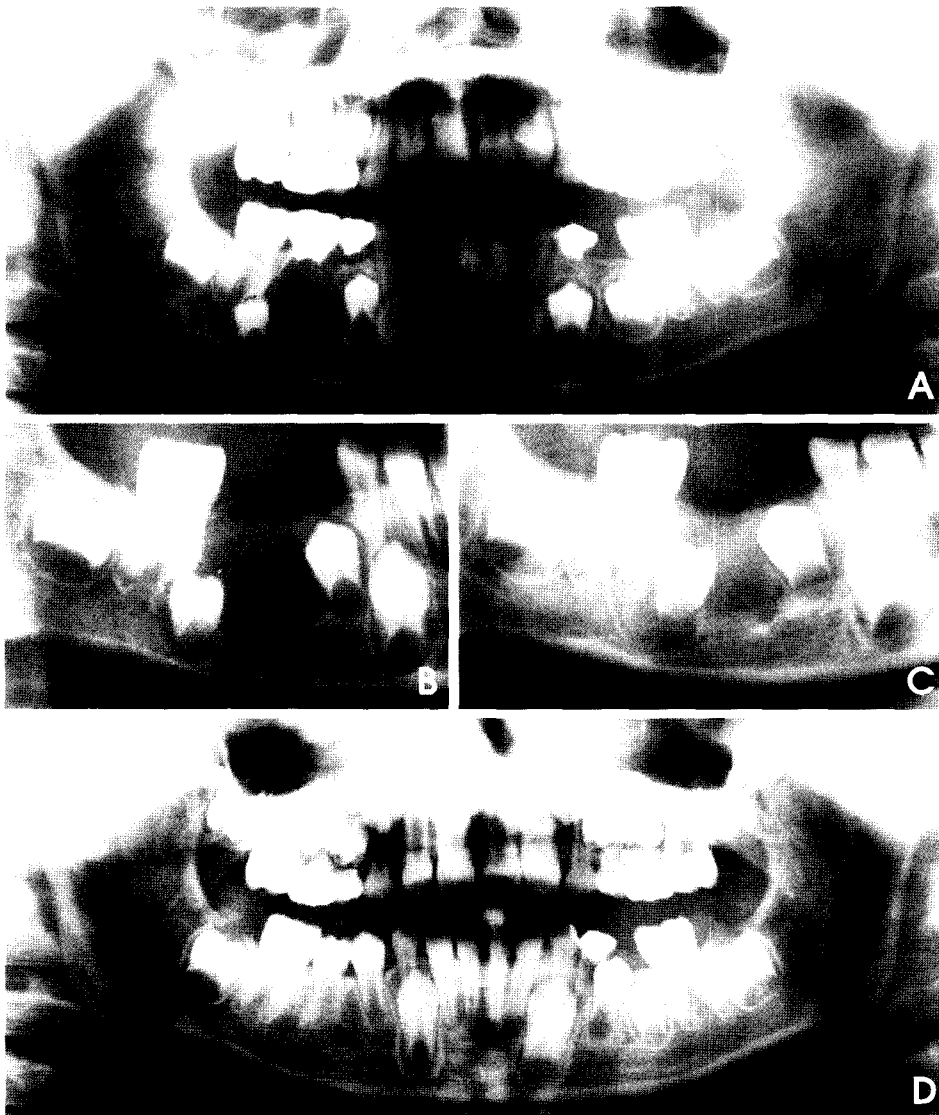
second premolar (Fig. 1B, C).

Seven months later, the right mandibular second premolar seemed to change its buccal angulation into normal upright position. Eleven months later, the right mandibular premolars erupted almost to the occlusal plane, while the teeth of the contralateral side did not erupt (Fig. 1D, E).

## 2. Case 2

A 7-year-old girl complained of an asymptomatic right

mandibular vestibular swelling. The panoramic radiograph showed a well-defined radiolucency involving the right mandibular deciduous second molar. The bone between the mesial and distal roots was resorbed, but the alveolar bone mesial to the mesial root and distal to the distal root was conserved. The developing right mandibular second premolar was displaced down to the mesial root of the right mandibular permanent first molar and it tilted slightly distally. The margin of the bone destruction was well-defined but without distinct hyperostotic border (Fig. 2A).



**Fig. 2.** A, On initial examination. A well-defined radiolucency involving the right mandibular second deciduous tooth. The right mandibular second premolar was displaced down to the mesial root of the right mandibular permanent first molar and it tilted slightly distally. B, After 2 weeks, the second premolar began to migrate mesially. C, After 3 months, the second premolar migrated more mesially and superiorly. D, After 14 months, the first and second premolars erupted almost to the occlusal plane, while the contralateral first premolar was erupting and the contralateral second premolar did not erupt.

The deciduous first and second molars were extracted and the cyst was marsupialized. An obturator was constructed and it was used as a space maintainer at the same time.

Two weeks later, the panoramic radiograph showed that the second premolar began to migrate mesially. After 3 months, the second premolar migrated mesially to the mesial root of the first permanent molar and stood slightly in normal mesial tilting position. After 14 months, the premolars erupted almost to the occlusal plane, while the contralateral first premolar was erupting and the contralateral second premolar did not erupt. The osseous pathology disappeared and was filled with bone density (Fig. 2B-D).

### Discussion

We, authors, thought these two BBCs were originated from

the buccal bifurcation of the mandibular deciduous second molars as in the case report of Camarda et al.<sup>2</sup>

Treatment of BBC includes extraction of the involved tooth, marsupialization, and enucleation of the cyst.<sup>4</sup> Marsupialization is a surgical procedure whereby the cyst is made an accessory compartment of the oral cavity. When the cyst is marsupialized and drainage is maintained by keeping the opening the cyst cavity patent with an obturator, new bone is steadily laid down all around the remaining capsule, until the bone cavity is completely filled with osseous tissue. After decompression of the cystic lesion, the cyst-associated impacted tooth can erupt naturally.<sup>5,9</sup>

The impacted tooth without complete root formation with an open apex has considerable potential to erupt after marsupialization. And the eruption speed and rate of angulation change of the cyst-associated teeth after marsupialization are

significantly faster than those of the teeth on the noncyst side, and significantly correlated with the diminishing rate of the cyst size.<sup>10</sup> These two cases showed that after marsupialization the cyst-associated displaced, developing teeth erupted naturally and faster than the contralateral teeth without cysts.

Several factors might explain the normal eruption of the cyst-associated teeth after marsupialization of the cysts in two cases of this report. First, marsupialization after extracting the deciduous second molars allowed the intracystic pressure to decrease.<sup>9,11</sup> Second, the healthy young bone surrounding the cysts had excellent regenerative potential.<sup>12</sup> The tooth axis could be changed by bone formation accompanied by pressure relief after marsupialization.<sup>10</sup> Third, the impacted teeth with incomplete root formation had considerable potential to erupt. Incomplete root formation of the teeth also facilitated the angulation change of the teeth.<sup>10-14</sup> Fourth, the eruption spaces for the impacted teeth were maintained.

Two cases of this report showed the cyst-associated, displaced developing permanent teeth could be saved by marsupialization procedure. Marsupialization should be considered especially for the treatment of the cystic lesion occurring in a young aged patient.<sup>5,6,9,10</sup>

All cystic cavities should be followed periodically by radiographic examination to learn whether they have recurred and to ensure that normal healing is occurring.<sup>6</sup> The follow-up radiographs in the two cases showed bone healing, root formation, and path of eruption of the associated tooth after marsupialization. The monitoring radiographs can be good teaching materials for the dental students and dentists to see the healing process of a cystic lesion and to understand what is the most appropriate treatment.

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