

Two cases of totally submerging buried primary molars: characterization of clinical behavior and discussion of cause

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Submerging buried tooth is a rare condition whose clinical characteristics are unclear. Two cases are reported of submerging buried maxillary second deciduous molar. A review of the literature in Japanese and English provides the clinical condition of the lesion and allows for discussion of its causes.

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INTRODUCTION

A number of tooth abnormalities are found in clinic, including supernumerary tooth, impacted tooth, and anodontia, and these often accompany an odontogenic tumor or cyst. On the other hand, a tooth that erupts in a normal position, but does not reach the occlusal plane is termed a submerged tooth. Submerged teeth occur most frequently beginning at about age 10. It is found, in descending order, on the mandibular second primary molar, mandibular second primary molar, maxillary second primary molar, and maxillary first primary molar.^{1,2} Although a high percentage of cases of submerging teeth were discovered in patients at advanced ages, it is thought that such teeth were buried into the jawbone deeply, indicating that the process begins at an earlier age.²

Submerged teeth cause caries of adjacent teeth, malocclusion, or eruption delay of the successive permanent tooth. Therefore, the extraction of a submerged tooth has been recommended.^{1,2} A submerging buried tooth is considered to be a tooth that, taken out of bite function on one occasion, had been burying into the jawbone. A submerging buried tooth should be distinguished from an impacted tooth and a submerged tooth. However, they are called totally submerged tooth,^{3,4} incompletely submerged tooth,⁵ submerged impact tooth,⁶ and buried tooth,⁷ and the clinical characteristics of submerging buried tooth are not defined. We report two cases of submerging buried maxillary second primary molar. Review of the English and

Japanese literature provides the clinical condition of the lesion and allows for discussion of its causes. We propose that this disorder be called submerging buried tooth.

CASE 1

A 16-year-old boy was referred on March 26, 1993, to the Department of Oral Surgery, Faculty of Medicine, Mie University, by his dental practitioner with a chief complaint of pain of the left maxillary teeth. The history revealed hyperthyroidism under treatment since approximately one year earlier. There was no history of trauma. His performance status was good, except for bilateral neck swelling due to the hyperthyroidism. His face was symmetrical, and a slight tenderness in the left submandibular lymph node was recognized.

Gingival swelling and tenderness of the elastic soft tissue of the left maxillary first molar region was recognized, as was discharge of milk-white pus from fistula. The left maxillary first molar inclined to medial, and a part of the second premolar cropped out in the palate side (Figure 1A).

A roentgenogram examination revealed a 3 x 1 cm diameter cyst-like radiolucent image that contained tooth-like radiopaque findings and the impacted second premolar that inclined to the distal side. Tooth root was not found in the tooth like radiopaque image, and gave a quality of a tooth crown thought to be an image of a tooth bud. A frosted glass finding was not found in the left maxillary sinus (Figure 1B). A tentative diagnosis of odontogenic tumor or dentigenous cyst was made, and enucleation was performed under general anesthesia.

The surface bone of the maxilla was partially defected; the tooth-like hard tissue was located in the maxilla and was covered with granular tissue. The bottom of the maxillary sinus was retained, and the tooth was enucleated easily. The left impacted second premolar was extracted simultaneously.

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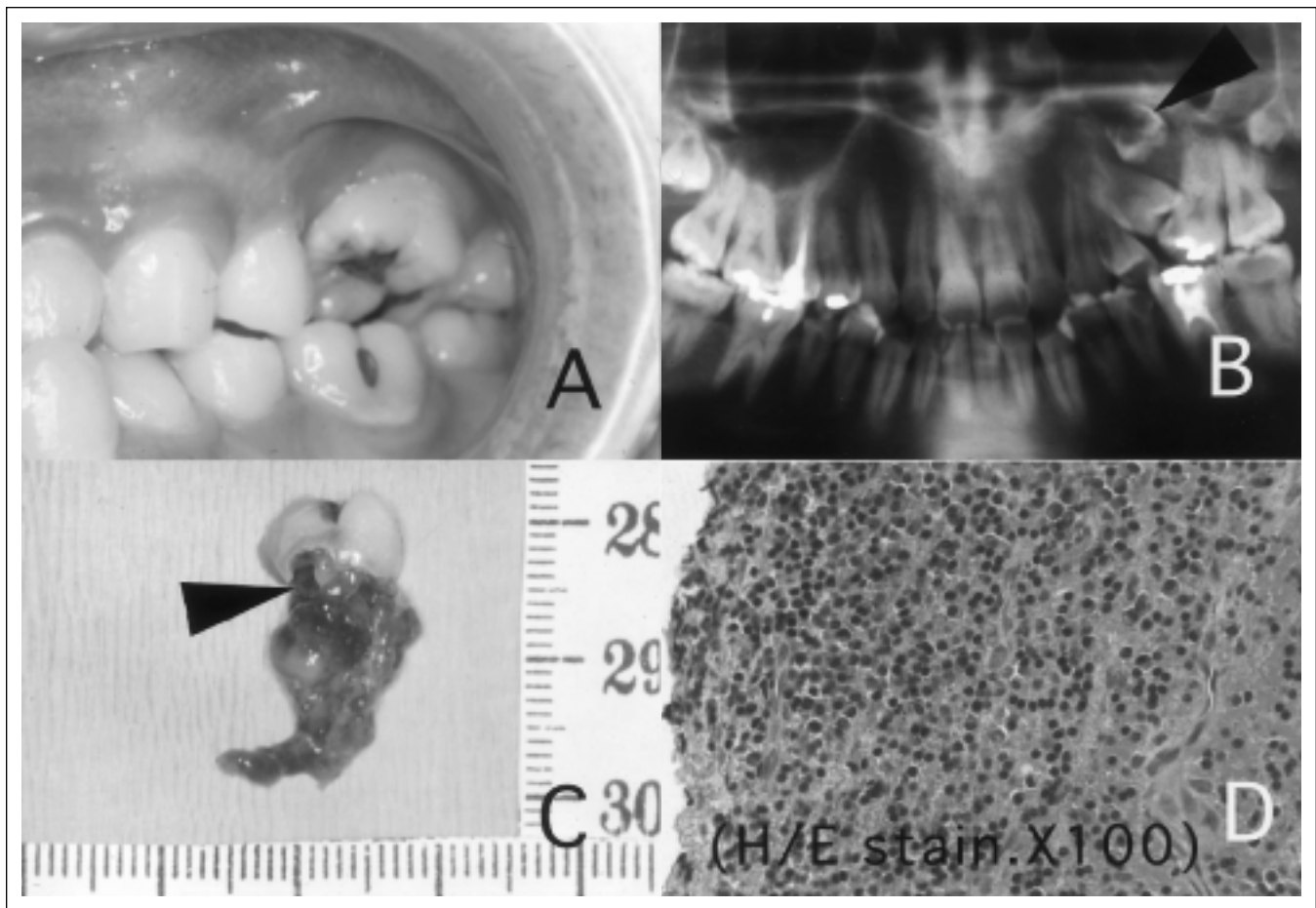


Figure 1. Case 1. A: Intra-oral findings. Left second premolar was absent, and first molar inclined to medial. B: Orthopantomogram view. The arrowhead indicates the impacted tooth. C: Enucleated material. Surrounding soft tissue adhered in the tooth root. D: Adhering soft tissue was inflammatory granular tissue of remarkable round cell infiltration, and no epithelium was seen (H/E stain. X100).

The tooth had 4 cusps with a white surface. It had a blackened part that reached the pulp cavity from the occlusal pit and dentin of the crown was softened. The tooth root was resorbed, and a few sharp enamel edges remained at the outskirts. Surrounding soft tissue adhered to the tooth root, and a part of it covered the tooth crown (Figure 1C). An abrasion specimen of the extracted tooth revealed the coloration reaction layer in caries side and a normal enamel rod inclination. Surrounding soft tissue was inflammatory granular tissue with remarkable round cell infiltration (Figure 1D). A final diagnosis of submerging buried tooth of the left upper second primary molar was made. The post-operative course was not eventful.

CASE 2

A 13-year-old girl was referred to our department by her dental practitioner on July 22, 1998, with a chief complaint of spontaneous pain of the right upper premolar region. There was no history of trauma. Her performance status was good, and her face was symmetrical.

Distal inclination and torsion of the right maxillary second premolar, medial inclination of right first molar,

and slight expansion of regional bone were recognized (Figure 2A).

Radiological examination revealed an impacted tooth whose crown was filled with metal, and a radiolucent area surrounding the tooth crown. In addition, a supernumerary tooth was recognized in the left upper incisor area (Figure 2B). In computed tomographic views, the impacted tooth was found in the maxilla (Figure 2C). A tentative diagnosis of submerging buried tooth was made, and enucleation was performed under local anesthesia.

The surface bone of the maxilla was partially defected and the tooth-like hard tissue was located directly under the mucous membrane and periosteum. It was extracted with adhered surrounding granular tissue. The supernumerary tooth of the central incisor region was extracted simultaneously (Figure 2D).

The extracted tooth had 4 cusps, dental caries was recognized in the occlusion surface, and the amalgam filling was done. Tooth root was absorbed, and surrounding granular tissue continued to pulp. Granular tissue showed pathologically inflammatory tissue

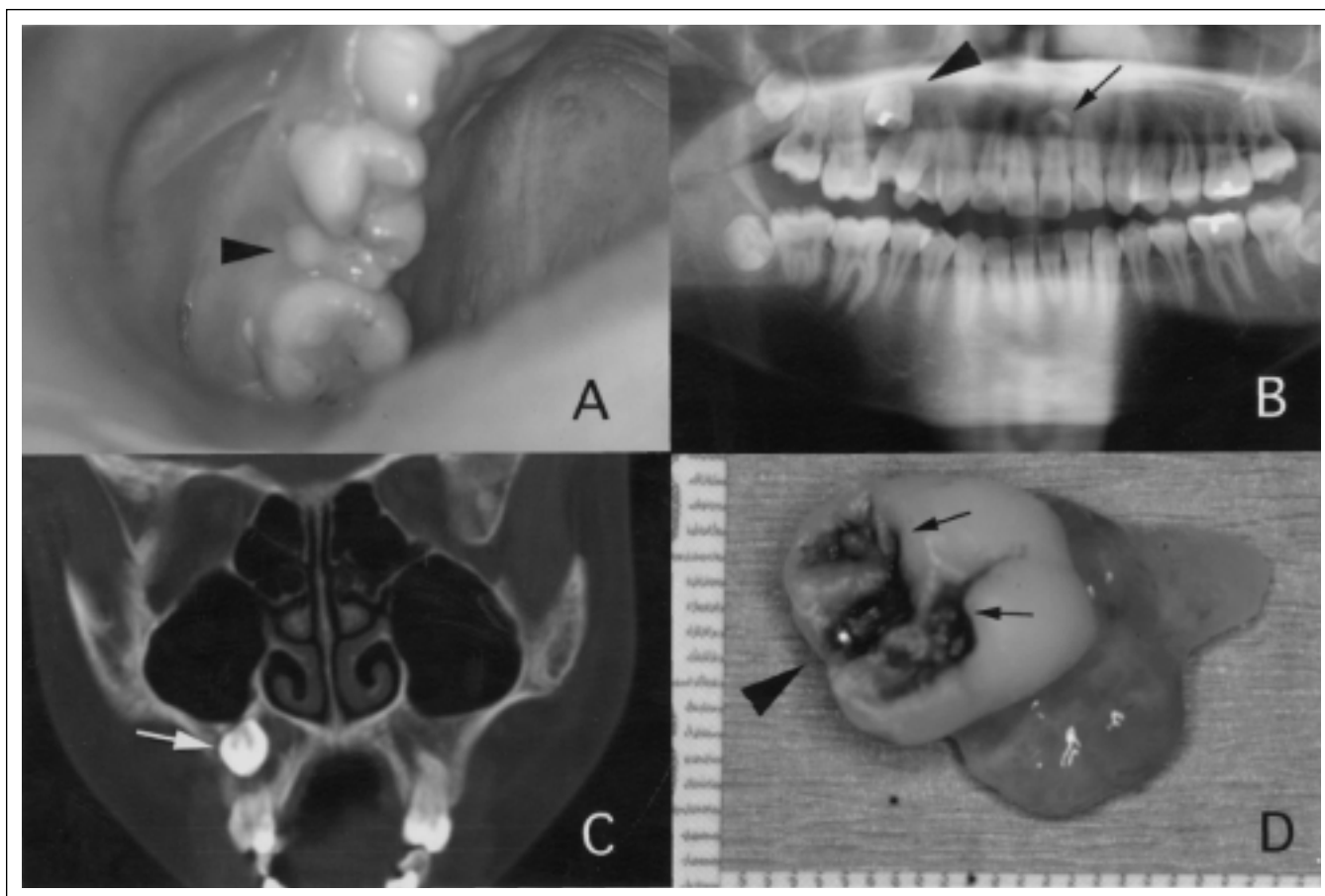


Figure 2. Case 2. A: Intra-oral findings. Right second premolar (□) was erupted, and a submerged tooth was found. B: Orthopantomogram view. The arrowhead indicates the impacted tooth with metal material. The arrow shows the supernumerary tooth. C: CT findings. The impacted tooth (□) was found in maxilla. D: Enucleated material. Surrounding soft tissue adhered in the tooth root. The arrowhead indicates the amalgam filling. The arrow shows the dental caries.

accompanied by single nucleus cell infiltration. A final diagnosis of submerging buried tooth of the right maxillary second primary molar was made. The post-operative course was not eventful.

DISCUSSION

Eighteen cases, excluding the present two, of submerging buried tooth²⁻¹⁷ are found in the English and Japanese literature. The greatest number of cases are found in the maxillary second primary tooth, followed by, in descending order, the mandibular second primary tooth, the mandibular first molar, and the maxillary first primary molar.

The male-to-female ratio is 12:8, the mean age is 19.6, and the range of ages is 10 to 38. The mean age is higher compared with the clinical research of submerged tooth.^{1, 18} This is thought to be caused by the period in which the submerged tooth is becoming buried more and more deeply into the jawbone.

The chief complaints are pain, swelling, and oral examination, in descending order. The findings that became evidence of diagnosis of submerging buried

tooth are revealed with 12 cases. The greatest number of findings is amalgam filling, followed by caries and dental history in descending order. Surgery is performed in all cases. Postoperative courses are uneventful in all cases.

Resorption of tooth root is found in all cases of primary tooth; however, slight root resorption is seen only in permanent tooth (Table 1). As mentioned, the clinical characteristics of submerging buried tooth are as follows: 1) It occurs predominantly in males. 2) The average age of occurrence is higher compared with that of a submerged tooth. 3) About half of the cases showed inflammatory symptoms such as pain and swelling. 4) Many cases of buried tooth are primary molars (18/20) and are found in maxilla (13/20). 5) Resorption of tooth root is found. 6) The successive permanent tooth exists (11/18), but it is impacted (7/11). 7) There is no difference between right and left sides.

There are thought to be three main causes of submerging buried tooth.^{18, 19} 1. Outside pressure, such as overwhelming growth of a slanted adjacent tooth, occlusion, and trauma. 2. Ankylosis of tooth. 3. Relative

burying as compared with growth of the jawbone by the eruption of an adjacent tooth. In our two cases of submerging buried tooth, ankylosis was not found during surgery. It was located in the jawbone. It was enucleated easily with surrounding soft tissue by an operation. It had inflammation, and resorption of tooth root was found regardless of the presence or absence of a successive permanent tooth. Furthermore, the granular tissue, which is enucleated at surgery, continues into the tooth pulp accompanied with inflammatory cell infiltration. When these factors are taken together, it is clear that submerging buried tooth becomes submerged with ankylosis occurs first. The jawbone grows with the eruption of an adjacent tooth, but the chronic inflammation remains and the bone surrounding the tooth retards growth. Tooth root and bone resorption are followed by stimulation of chronic inflammation, and the tooth is completely buried.

Because there was not filler in the present case (case 1), as a result of various findings, discrimination between odontogenic cyst and odontogenic tumor was difficult. A case of severe reaction to inflammation⁸ is reported, and attention is necessary for differential diagnosis. A submerging buried tooth started out as a submerged tooth in the process of becoming buried, and the submerged tooth was not discovered because there were no symptoms. As many submerging buried teeth have subjective symptoms by infection, a submerged primary tooth needs to be extracted before it becomes buried in the jawbone.

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