

Case Report

Eruption sequestrum identified in mandibular molar region: Case report and review of literature

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Abstract We treated a case of eruption sequestrum in an 8-year 1-month old boy. The patient first came to our clinic with a chief complaint of discomfort in the mandibular left first molar region. An intraoral examination revealed a small hard tissue fragment on the occlusal surface of the erupting mandibular left first molar, while a periapical radiograph showed a bone-like radiopaque mass. We diagnosed the lesion as eruption sequestrum, and removed it under topical anesthesia. A histopathological examination of the sectioned extirpated tissue showed necrotic cortical bone without osteocytes within the lacunae. Although eruption sequestra are occasionally encountered in daily practice, there is a limited number of reports describing details of specific cases, with only 14 known cases reported in literature. Herein, we report our findings and summarize those in other reports based on clinical, radiographic and histopathological findings.

Key words

Eruption sequestrum,
Histopathology,
Molar

Introduction

Eruption sequestrum, an anomaly associated with the eruption of teeth, was first described in 1963¹⁾. That study reported that a typical feature of the lesions is a small and irregular bone spicule overlaying the crown of an erupting permanent molar. They also noted that eruption sequestra are commonly found just prior to or immediately following emergence of the tips of the cusps of the teeth through the oral mucosa. In general, the position of the spicule is directly overlaying the central occlusal fossa, but contained within the soft tissue, and the bone fragment is lost as the tooth continues to erupt and the cusp emerges.

Although eruption sequestra are occasionally encountered in daily practice, there is a limited number of reports describing the details of specific cases¹⁻⁸⁾, of which only a few provide descriptions

of histopathological findings^{1,2,4,5,7,8)}. We treated an 8-year-old boy with an eruption sequestrum in the mandibular left first molar region. Herein, we present the clinical and histopathological features of our patient, and compare them to other cases reported in literature.

Case Report

An 8-year 1-month old boy came to our clinic with the chief complaint of discomfort in the mandibular left first molar region. An intraoral photograph taken at the first visit showed a small tissue fragment on the occlusal surface of the erupting mandibular left first molar (Fig. 1). According to his parents, a similar lesion was identified in the maxillary left molar region 6 months previously, which was removed by a general practitioner. The present lesion appeared to be formed as an irregular quadrangle with dimensions of about 5 × 3 mm at its broadest borders. A periapical radiograph showed a bone-like radiopaque mass over the crown of the affected molar (Fig. 2),

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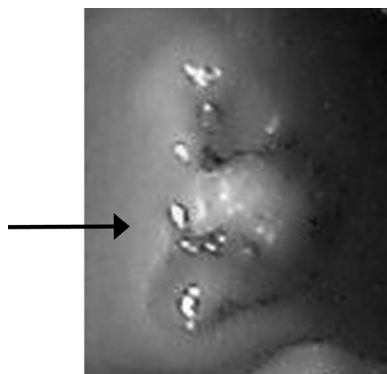


Fig. 1 Intraoral photograph of mandibular molar region taken at the first visit
Arrow indicates the lesion.

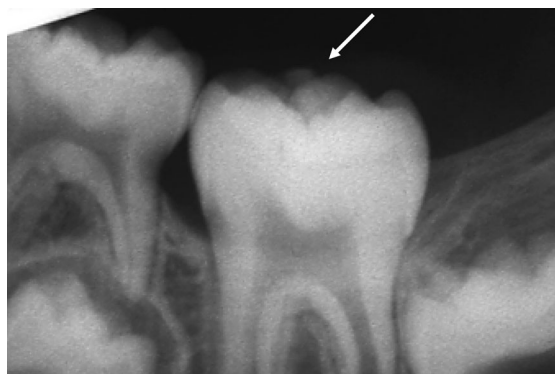


Fig. 2 Periapical radiograph taken at the first visit
Arrow indicates the lesion.



Fig. 3 Orthopantomograph taken 6 month prior to coming to our clinic by a general practitioner
Arrow indicates the lesion.

while an orthopantomograph taken 6 months prior to coming to our clinic by the general practitioner exhibited a relatively lower position of the affected tooth as compared to the molar in the opposite quadrant (Fig. 3). In addition, the dental age of the patient appeared to be delayed as compared to his chronological age. Therefore, we calculated the dental age by the method of Haavikko⁹⁾, which is considered accurate for Japanese subjects¹⁰⁾. The dental age of our patient was calculated to be 6.6 ± 0.4 years of age (mean \pm standard deviations), which was approximately 1 year younger than his chronological age.

Based on the clinical findings, we diagnosed the lesion as eruption sequestrum, and decided to remove it under topical anesthesia. Histopathological sections with hematoxylin-eosin staining of the extirpated tissue were produced using conventional methods, which showed necrotic cortical bone

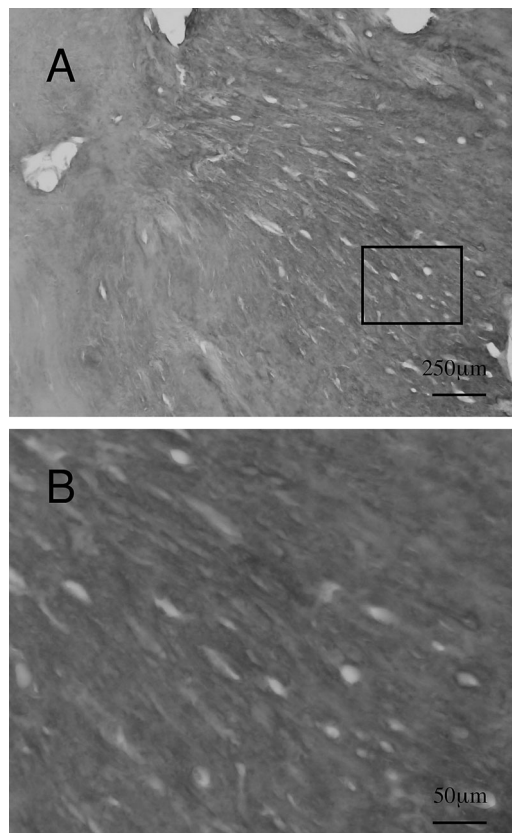


Fig. 4 Histopathological appearance of extirpated calcified mass with hematoxylin-eosin staining

(A) Low magnification
(B) High magnification of the area in (A) enclosed with a square

without osteocytes within the lacunae (Fig. 4).

Review of literature

Table 1 summarizes the 14 known reported cases of

Table 1 Summary of 14 reported and the present cases of eruption sequestra

Case	Age	Gender	Location	Size	Chief complaint	Radiographic findings	Country	References
1	5	F	LR6	ND	ND	Tiny irregular opacity separated from tooth	USA	(1)
2	5	M	LL6	ND	ND	Tiny irregular opacity separated from tooth	USA	(1)
3	6	M	LR6	4×3 mm	Hard mass over LR6	Egg-shaped radiopaque mass	UK	(2)
4	6	M	LR6/LL6	6×4 mm	Periodical examination	ND	USA	(3)
5	6	F	UR6	ND	New-patient examination	Small radiopaque mass	USA	(3)
6	6	F	UR6/UL6/ LR6/LL6	ND	Periodical examination	Radiopaque fragments	Canada	(4)
7	6	M	LL6	4×2 mm	Discomfort in LL6 area	Thin radiopaque mass	Japan	(5)
8	7	M	UR6/UL6/ LR6/LL6	ND	Symptomless	Radiopaque fragments	Canada	(4)
9	10	M	UL6	ND	Discomfort in UL6 area	Radiopaque mass within the soft tissue	Singapore	(6)
10	11	M	LR7	5×3 mm	Pain in gingiva	Not easily detected	USA	(3)
11	11	F	LR7	ND	Periodical examination	ND	USA	(3)
12	12	M	LR7/LL7	ND	ND	ND	USA	(3)
13	12	M	LR7/LL7	ND	Pain	Radiopaque mass	USA	(7)
14	12	F	LL7	5×2 mm	Pain	ND	Japan	(8)
15	8	M	LL6	5×3 mm	Discomfort in LL6 area	Bone-like radiopaque mass	Japan	This case

ND: no description

Table 2 Histopathological findings of 7 reported and the present cases of eruption sequestrum

Case no.*	Hard tissue	Adjacent soft tissue	Reference
1	Compact and non-viable bone.	ND	(1)
3	Acellular calcified mass (most empty space, some occupied by bacterial plugs).	ND	(2)
6	Large irregular space containing necrotic debris, tags of fibrous tissue, and colonies of microorganisms. Small empty lacuna-like spaces.	ND	(4)
7	Necrotized cortical bone (bone vacuole vacant). Bacteria in the resorption surface.	Proliferation of granulation tissue, chronic inflammatory alterations.	(5)
8	ND	Nest of hyperplastic odontogenic epithelium containing deposits of hyaline material.	(4)
13	Non-viable compact bone. No osteocytes within lacunae.	ND	(7)
14	Necrotized cortical bone (bone vacuole vacant).	Chronic gingival inflammation.	(8)
15	Necrotized cortical bone (bone vacuole vacant).	NC	This case

*: Case numbers correspond to those in Table 1, ND: no description, NC: not collected

eruption sequestra. The condition is primarily seen in children aged 5 to 7 years old at the time of eruption of the first permanent molars, while that in patients around 12 years of age is associated with an erupting second permanent molar. The majority have been observed in mandibular first permanent molars, though mandibular second permanent and

maxillary first permanent molars are occasionally affected. The typical shape of the lesion is reported to be a fragment with an irregular morphology, with sizes ranging from approximately 4–6 mm in width and 2–4 mm thick. Eruption sequestra generally cause no signs or symptoms, though several reports have noted patient complaints of discomfort or pain

in the affected areas. Radiographic examinations have sometimes found a clear radiopaque mass overlaying a molar tooth, when the size of the lesion is large enough to be detected.

Table 2 summarizes the histopathological findings of 7 cases of eruption sequestra reported in literature. Necrotized cortical bone is the most common appearance and the bone vacuole is generally shown to be vacant. Large irregular spaces containing necrotic debris, tags of fibrous tissue, and colonies of bacteria are also typical findings. In addition, some adjacent soft tissue is often affected with chronic gingival inflammation.

Discussion

The clinical features in the present case, such as location and size of the lesion, are considered to be typical as compared to other reported cases (Table 1). On the other hand, our patient is the oldest (8 years 1 month) of cases reported to occur in the first permanent molar region. However, the dental age in the present case was to be delayed, and which corresponds to the average time of eruption of the first permanent molars. A nationwide survey in Japan showed that the time of eruption of the mandibular first permanent in boys was 6.05 ± 0.08 years old, with a range of 4.09–9.03 years¹¹⁾. Thus, it is possible that cases of eruption sequestra can occur between the ages of 4 and 9 years old. It is important for clinicians to keep in mind that the predominant age of eruption sequestrum cases is dependent not on chronological but rather dental age of the patient.

There is a limited number of histopathological reports regarding eruption sequestra, in which both hard and adjacent soft tissues were analyzed^{1,2,4,5,7,8)}. As for hard tissue, the most common findings are necrotizing cortical bone with a vacant bone vacuole. In addition, identification of bacterial colonies has been reported in some cases^{2,4,5)}. In the present patient, the extirpated hard tissue had an appearance typical of that in previous reports, though no evidence of microorganisms was detected. Maki *et al.*⁸⁾ found that the weight percentage of calcium to phosphorous in an eruption sequestrum lesion was higher than that of normal osseous tissue, indicating that its chemical components also differ from those of normal tissue. It is considered that a little difference of histopathological findings might be due to the condition of eruption sequestra, such as position of eruption sequestra or period of eruption

sequestra existed.

It is considered that most eruption sequestra cases are not clinically significant, since the condition exists for only a short period and may not be observed by the clinician¹⁾. On the other hand, several cases have been reported in which the patient felt discomfort or pain in the affected region^{3,5-8)}. In contrast, eruption sequestra have also been incidentally found during new-patient or periodical examinations³⁾. The orthopantomography findings in the present case revealed that the position of the mandibular left first permanent molar reached to half of the crown of the adjacent second primary molar at approximately 6 months after extirpation of the tissue overlaying the tooth. This result suggests that removal of a sequestrum, which is not considered likely to be spontaneously exfoliate, is necessary in daily practice.

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