Case Report

Erupted Complex Odontoma Delayed Eruption of Permanent Molar

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Abstract

Odontomas, benign tumors that develop in the jaw, rarely erupt into the oral cavity. We report an erupted odontoma which delayed eruption of the first molar. The patient was a 10-year-old Japanese girl who came to our hospital due to delayed eruption of the right maxillary first molar. All the deciduous teeth had been shed. The second premolar on the right side had erupted, but not the first molar. Slight inflammation of the alveolar mucosa around the first molar had exposed a tooth-like, hard tissue. Panoramic radiography revealed a radiopaque mass indicating a lesion approximately 1 cm in diameter. The border of the image was clear, and part of the mass was situated close to the occlusal surface of the first molar. The root of the maxillary right first molar was only half-developed. A clinical diagnosis of odontoma was made. The odontoma was subsequently extracted, allowing the crown of the first molar to erupt almost 5 months later. The dental germ of the permanent tooth had been displaced by the odontoma. However, after the odontoma had been extracted, the permanent tooth was still able to erupt spontaneously, as eruptive force still remained. When the eruption of a tooth is significantly delayed, we believe that it is necessary to examine the area radiographically. If there is any radiographic evidence of a physical obstruction that might delay eruption, that obstruction should be removed before any problems can arise. Regular dental checkups at schools might improve our ability to detect evidence of delayed eruption earlier.

Key words: Erupted odontoma—Delayed eruption—Molar—Child

Introduction

The eruption of a tooth can be delayed by a lack of the necessary space to accommodate

it or the presence of an alien substance in the path of eruption, with one example of the latter being an odontoma²⁰⁾. Odontomas, one of the most common forms of benign

Fig. 1 Intraoral photographs taken at initial examination
Erupted odontoma on alveolar mucosa in distal area of maxillary right second premolar (arrow).
There was no crowding in dentition and mandibular right lateral incisor was missing.

odontogenic tumor in the jaw, are usually slow growing and nonaggressive, and they can be classified as either compound or complex⁴⁾. It is rare for intrabony odontomas to emerge into the oral cavity, and they are termed “erupted odontomas” if they do¹⁷⁾. Here, we report a case of an erupted complex odontoma obstructing the eruptive path of the first molar. We describe the subsequent removal of the odontoma, which allowed the affected tooth to erupt.

Informed consent from both the patient and her guardians was obtained for the publication of this report.

Case

A Japanese girl aged 10 years and 5 months was referred to our hospital by her family dentist with the main complaint of a delayed eruption in the posterior dentition. The patient’s guardians had not realized that the tooth had not erupted until informed so by the family dentist. The tooth affected was the maxillary right first molar. Her general health condition was good, and eruption was at Hellman’s dental development stage IIIC. The mandibular right lateral incisor was missing, but no evidence of caries was found. A hard, tooth-like tissue had, however, erupted

on the alveolar mucosa at the distal aspect of the maxillary right second premolar (Fig. 1). A slight inflammation was also noted in the neighboring mucosa.

Panoramic radiography revealed a radiopaque lesion approximately 1 cm in diameter. The border of the image was clear and proximal to the occlusal surface of the maxillary right first molar. The subsequent clinical diagnosis was odontoma (Fig. 2). The first and second molar crowns on the right side of the maxillary dentition were displaced distally. The root development of the maxillary right first molar was approximately half completed, and the root of the second molar had not yet formed.

The odontoma was extracted under local anesthesia, revealing the crown of the maxillary first molar which it had concealed (Fig. 3). The masses removed were hard and showed conglomeratic solid features with a rugged outward appearance (Fig. 4). Microscopically, the masses consisted of haphazard conglomerates of dentin, enamel, enamel matrix, cementum and pulp tissue (Fig. 5), leading to a pathological diagnosis of complex odontoma.

No postoperative complications were observed. At 2 weeks postoperatively, the mesio-buccal cusp of the maxillary first molar erupted. At 2 months postoperatively, three-quarters

Fig. 2 Panoramic radiograph taken at first examination (10 years 5 months of age)
Radiopaque lesion close to maxillary right first molar occlusal surface (arrow).

Fig. 3 Postoperative intraoral view
Tooth crown of first molar can be seen under masses (arrow).

Fig. 4 Extracted tissues
Macroscopically, extracted masses showed conglomeratic solid features.

of the tooth crown had erupted, with almost complete eruption being accomplished within 5 months (Fig. 6). The enamel of the occlusal surface the tooth was roughened due to the odontoma-induced delay in eruption and proximity to the first molar. Therefore, pit and fissure sealant was applied to prevent the development of caries. At around the same time, the maxillary left second molar erupted, whereas the right second molar did not. Panoramic radiography revealed distal displacement of the right second molar, indicating no change since her initial examination (Fig. 7). Careful observation and follow-up

on the progress of the maxillary right second molar will be necessary.

Discussion

It is unusual for an odontoma to erupt in the oral cavity. Amado *et al.* reported in a review of the literature that erupted odontoma occurred in only 1.6% of cases²⁾. Odontomas are one of the most common odontogenic tumors, occurring most frequently in children and adolescents⁴⁾. The area of predilection for compound odontomas is around the maxillary

Fig. 5 Histopathological features of extracted odontoma stained with hematoxylin and eosin

Microscopically, an irregular arrangement of dentin, enamel, enamel matrix, cementum, and pulp-like connective tissue forming an irregular mass enclosed in a fibrous capsule was observed. At high magnification, cementoblasts and odontoblasts could be seen (arrow).

Fig. 6 Progress postoperatively

- A: Two weeks later, mesiobuccal cusp of maxillary first molar erupted.
 B: Three-quarters of tooth crown erupted 2 months after operation.
 C: Almost completely erupted at 5 months postoperatively.

anterior teeth, while in complex odontomas it is around the mandibular molars^{4,11,15}. It is believed that 37–87% of all eruption disorders in the dentition are caused by odontomas^{7,11,22}. Ueno *et al.* reported in a review of the literature that 86% of complex odontomas which

erupted were accompanied by an impacted tooth²⁴.

Table 1 shows the cases of odontoma reported in the English-language literature since 2000. Erupted complex odontomas are more often found in posterior molars, with

Fig. 7 Panoramic radiograph at 5 months postoperatively
Second molar was displaced in distally (arrow).

Table 1 Previous case reports of erupted complex odontoma (published since 2000)

Authors	Year	Age/ Sex	Location/associated tooth	Symptoms	Treatment plan for impacted tooth
Ragalli <i>et al.</i> ⁽¹⁶⁾	2000	59/F	Posterior maxilla/no tooth	None	N/A
Ferrer <i>et al.</i> ⁽⁸⁾	2001	22/F	Posterior maxilla/first molar	Pain and swelling (Recurrent infection)	Extracted
Litonjua <i>et al.</i> ⁽¹²⁾	2004	17/F	Posterior mandible/molar	Pain and swelling	Erupted
Junquera <i>et al.</i> ⁽¹⁰⁾	2005	23/F	Posterior maxilla/second molar	None	Extracted
Bertolai <i>et al.</i> ⁽⁵⁾	2007	29/F	Posterior mandible/third molar	Pain and swelling (Ludwig's angina)	Extracted
Vengal <i>et al.</i> ⁽²⁵⁾	2007	23/M	Posterior mandible/third molar	Pain and facial asymmetry	Extracted
Miya <i>et al.</i> ⁽¹⁴⁾	2007	17/M	Posterior mandible/second molar	Swelling	Extracted
Iliet-Ala <i>et al.</i> ⁽⁹⁾	2008	2/F	Posterior maxilla/first and second deciduous molars	Bleeding	Erupted
Serra-Serra <i>et al.</i> ⁽¹⁸⁾	2009	11/F	Posterior mandible/second molar	Pain and swelling	Erupted
		26/M	Posterior maxilla/second molar	None	Extracted
Biocic <i>et al.</i> ⁽⁶⁾	2010	10/F	Posterior mandible/dentigerous cyst	Pain and swelling	N/A
Tozoglu <i>et al.</i> ⁽²³⁾	2010	22/F	Posterior maxilla/second molar	None	Unknown
Arunkumar <i>et al.</i> ⁽³⁾	2012	22/M	Posterior maxilla/first and second molars	Pain, swelling and facial asymmetry	Under observation
Spini <i>et al.</i> ⁽¹⁹⁾	2012	9/M	Anterior mandible/four incisors and two canines	Swelling	Erupted
Ali Azhar <i>et al.</i> ⁽¹⁾	2013	17/M	Posterior mandible/second molar	None	Erupted
Present case	2013	10/F	Posterior maxilla/first molar	None	Erupted

approximately 50% of them occurring in adults. There are only a few reports in which the odontoma was associated with an impacted tooth in children aged 12 years or under. In adults, the impacted tooth is usually extracted^(5,8,10,18,25), whereas in children, the

delayed tooth usually erupts spontaneously^(9,18,19). There is one report of a 7-year-old boy in whom it took 7 years for 6 impacted teeth to erupt from beneath a massive odontoma of 6-cm diameter, after which crowding of the mandibular anterior teeth was diagnosed⁽¹⁹⁾.

In the present case, the tooth was almost fully erupted within 5 months, so over-extrusion of the mandibular molars was avoided. However, space maintenance and/or orthodontic treatment may be required if any significant delay in eruption is predicted. Since the mandibular right lateral incisor was missing in the present case, the maxillary right first molar occluded the mandibular right second molar. Currently, the maxillary right second molar is under observation. However, even if it erupts, there will be no occlusion, so it may need to be extracted. The following factors are considered to be significantly associated with erupted odontoma in the oral cavity: age-related bone resorption, bone resorption due to periodontal disease, signs of tooth output around the odontoma, resorption of alveolar bone by the growth of an odontoma, and caries in an impacted tooth¹⁰⁾. In the present case, a marked delay was observed in the eruption of the first molar in comparison with that of the same tooth on the contralateral side. This may have been because the first molar root was still developing and was pushing the odontoma into the oral cavity as its root developed.

Odontomas are often asymptomatic^{4,15)}. However, in several cases, Ludwig's angina and recurrent inflammation occurred following the eruption of an odontoma in the oral cavity^{3,5,8,14,18,25)}. In addition, there have been cases reported of odontomas causing discomfort in the tongue mucosa and irritation at the tip of the tongue¹⁸⁾. López-Areal *et al.* reported a case in which malocclusion was caused by the eruption of an odontoma¹³⁾. Although we observed slight inflammation of the mucosa adjacent to the erupted odontoma, there were no subjective symptoms or swelling in the present case.

The reason for the low level of enamel calcification observed in our case is unclear, but may have been related to the development of the odontoma. Delayed radicular formation and abnormalities have been reported with teeth found in proximity to an odontoma²¹⁾. In our case, delayed radicular formation was found not only at the first

molar, but also at the second molar. In one report, the permanent tooth germ was initially believed to be congenitally missing. Surgical exposure and retraction of the impacted second primary molar, however, revealed the existence of the permanent tooth germ, which was then able to continue to develop normally²⁶⁾. This suggests that the dental germ of the permanent tooth might develop normally if the obstruction can be removed within the normal period of eruption as indicated by development on the contralateral side.

When tooth eruption is markedly delayed, it is important to investigate the cause by using radiography. We would suggest that oral examinations at school would be the most appropriate means of improving earlier detection of eruption disorders. Our patient had received an annual school dental examination, but because she did not have any subjective symptoms the fact that the first molar had not erupted was not noticed until she was more than 10 years old. Delayed eruption of a tooth is not included in the standard dental health examination at Japanese schools. In the present case, the first molar eventually erupted after successful extraction of the odontoma, but the formation of the molar dental germ might not have been delayed if we had been able to discover the odontoma earlier. Further, if there is radiographic evidence of a physical obstruction which is delaying eruption, it should be removed before any problems arise. We are convinced that inclusion of screening for delayed tooth eruption in the standard school dental checkup would improve oral health in children.

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