

Outcome of a Dentigerous Cyst following Decompression using a Removable Appliance: A Case Report

Basak Durmus¹, Barhan Pekel¹, Faysal Ugurlu², Ilknur Tanboga¹

¹Department of Pediatric Dentistry, Faculty of Dentistry, Marmara University, Istanbul, Turkey. ²Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Marmara University, Istanbul, Turkey.

Summary

A dentigerous cyst is a benign odontogenic cyst that is associated with the crown of an unerupted permanent tooth. This report describes a conservative approach to treatment using a customised removable appliance for managing a large dentigerous cyst in a 7-year-old female. At the 2-year follow-up, healing of the lesion and ossification of the bony defect was observed.

Key Words: Dentigerous Cyst, Case Management, Decompression

Introduction

Radicular and dentigerous cysts are two common types of odontogenic cyst. While radicular cysts usually occur in response to pulp death and subsequent tissue necrosis, dentigerous cysts develop around the crowns of unerupted teeth, apparently in the absence of an inflammatory stimulus [1]. Dentigerous cysts occur more frequently in the lower jaws of patients aged 6–12 years. A cyst is asymptomatic if it remains small. Therefore, lesions are often detected during routine radiographic examinations [2,3].

The cyst cavity is lined with reduced enamel epithelium derived from the tooth-forming organ of an unerupted permanent successor [4]. On radiographic evaluation, it appears as a round or void, well-defined unilocular radiolucency surrounding the crown of an unerupted tooth [2,3,5].

The case presented here describes a conservative approach for managing a large dentigerous cyst in a child using a customised removable appliance.

Case

A 7-year-old female was referred to the Department of Paediatric Dentistry, School of Dentistry, Marmara University, Turkey, complaining of pain and swelling. She was in good general health with no significant medical history or associated syndromes.

The intraoral examination revealed mixed dentition, swelling

in the left mandibular region and tenderness over a pulpomised lower left second primary molar (#75) with an amalgam restoration. The panoramic radiograph revealed a well-defined unilocular radiolucency approximately 3×3 cm in size under the primary left mandibular molar area extending to the lower border of the mandible. This extended from the distal side of the mandibular left first bicuspid (#34) to the mesial side of the permanent mandibular left first molar (#36). The radiolucency also enclosed the crown of an unerupted second premolar and caused displacement of the related tooth (#35) (*Figure 1*).

Decompression was planned based on the size of the cyst, age of the patient and proximity to clinical features. A customised removable decompression appliance was made to fit the lower arch (*Figure 2a* and *b*). The cast was moulded to suit the appliance which had a 2 cm long, 2.5 mm wide hole (*Figure 2a*) over the cyst from the lower left second primary molar (#75) to enable regular irrigation. The design of the appliance prevented formation of a fibrous scar, promoted decompression of the cystic lesion, and maintained space on both sides.

Under general anaesthesia, the lower left second primary molar (#75) and second permanent premolar (#35), to which the cystic lumen was attached, were extracted (*Figure 3*). Then, a specimen of the cystic lesion in fixative solution was sent to the Pathology Department for histopathological examination.



Figure 1. Panoramic radiograph showing a large radiolucent lesion with displacement of the permanent second premolar in the left mandible.

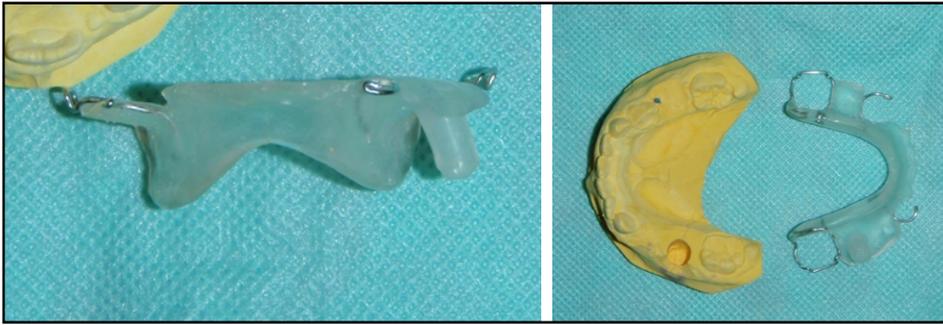


Figure 2 a-b. Customised removable appliance with a resin extension penetrating the cyst cavity.



Figure 3. Initial operation site.

Histopathology revealed a 2-3 layer stratified squamous non-keratinized epithelium with a fibrous connective tissue wall and few inflammatory cells. The findings were compatible with a cystic lesion and the diagnosis of dentigerous cyst was confirmed postoperatively (Figure 4). The appliance was placed immediately following wound closure with 5-0 Polyglactin 910 sutures (Vicryl; Ethicon, Johnson & Johnson, USA). The resin projection was adjusted to fit the socket of the extracted tooth (Figure 5).

Postoperative antibiotics and analgesics were prescribed. The patient was also instructed to maintain good oral hygiene. The parents of the patient were instructed to irrigate the lesion with saline solution once per day to prevent obstruction and infection. The patient visited our department for clinical examinations once per week for 1 month (Figure 6).

After 6 months, the panoramic view of the lesion was detected as in Figure 7. Therefore, the cyst epithelium and excess tissue were removed under local anaesthesia. The wound was closed with the 4/0 Polyglactin 910 sutures (Vicryl; Ethicon, Johnson & Johnson, USA). Regular recall visits were scheduled every other month to adjust the removable appliance. The removable appliance converted into a removable space-maintainer by reducing the length of the resin projection of the appliance once a month (Figure 8).

Panoramic radiographs showed that the size of the cyst decreased gradually. In addition, bone started to develop at the edge of the cyst during the decompression period. The bone density increased over time and bone trabeculation was seen at the end of the first year (Figure 9). To provide space for the eruption of the right permanent teeth and to resolve marginal crowding, a lingual arch appliance was used instead of the removable appliance for an additional 1 year (Figure 10).

A radiograph after 24 months revealed adequate bone

regeneration at the surgical site. No clinical or radiological signs of recurrence of the lesion or any complications associated with the treatment were observed (Figures 11 and 12).

Discussion

In the case presented here, we used a conservative approach to manage a large dentigerous cyst in a child using a customised removable appliance.

There are at least two types of dentigerous cyst. The first type is developmental in origin and occurs in mature teeth, usually as a result of impaction. These cysts usually occur in the late second and third decades, predominantly involving mandibular third molars; there is generally no inflammation unless the cyst becomes infected secondarily. The second type is inflammatory and occurs in immature teeth as a result of inflammation from a non-vital deciduous tooth or other source involving the tooth follicle. This type is diagnosed in the first and early part of the second decade, predominantly involving the mandibular premolars [6]. Mandibular molar area is the most common site of involvement, whereas if maxilla is involved the anterior region is the most common area. Three radiological variations of the dentigerous cysts are observed [7]: Central variety, circumferential variety, and lateral type. In our case, it was of the central envelopmental variety in which the entire tooth appeared to be enveloped by cyst.

The literature includes reports on both conservative and radical surgery for treating dentigerous cysts. Marsupialisation or decompression is a conservative technique that attempts to relieve the intracystic pressure by creating an accessory cavity [8,9]. It is generally accepted that the extraction of a non-vital primary tooth and the marsupialisation process ensure rapid healing of the lesion and the eruption of the permanent tooth [3,8]. Removal of the

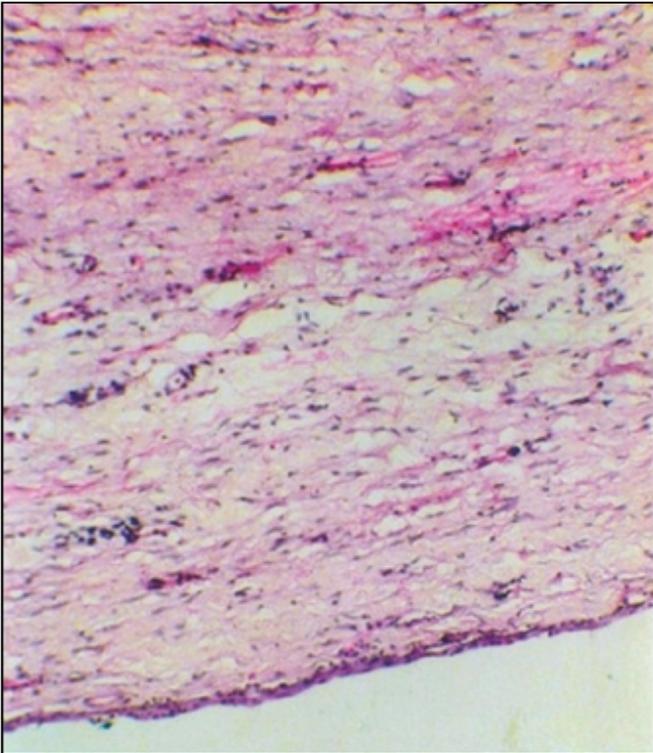


Figure 4.: Histopathology photomicrograph of the specimen.

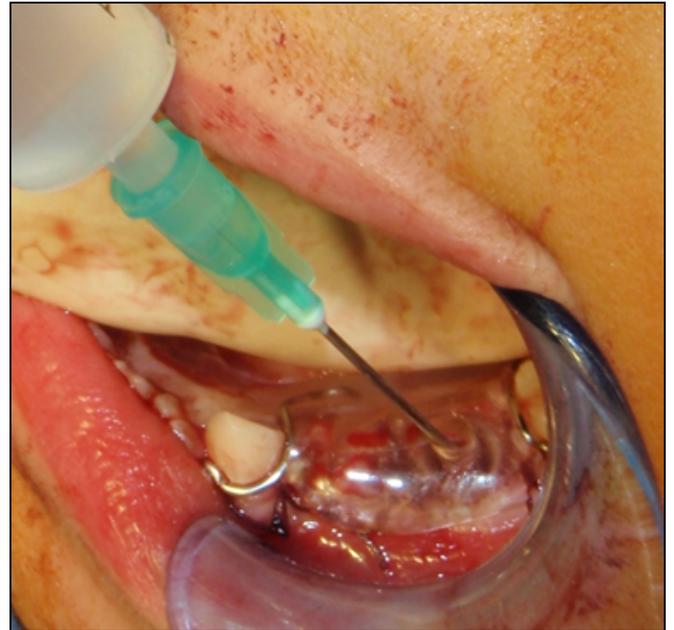


Figure 6. Irrigation of the lesion.

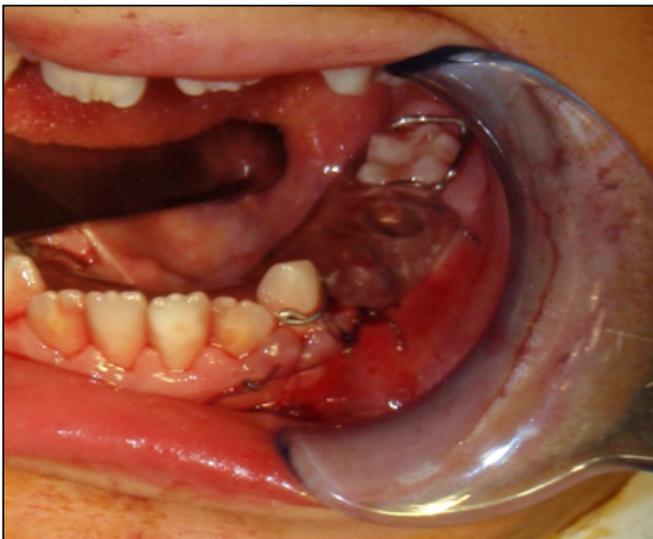


Figure 5. The decompression appliance was adjusted following the surgery.

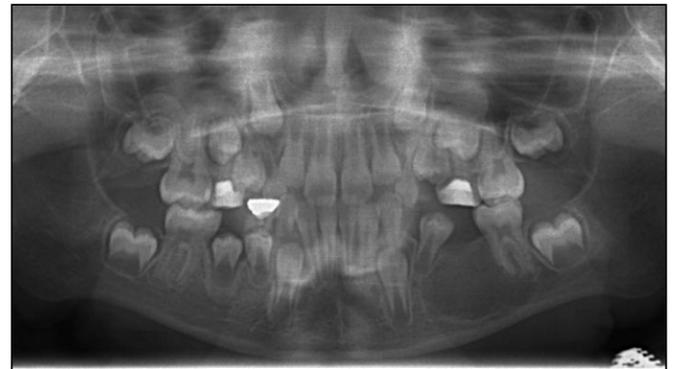


Figure 7. Panoramic view before second operation after 6-month.



Figure 8. Decompression appliance converted to a removable space maintainer.

permanent tooth might be required if its development is not sufficient and it is markedly displaced [3]. The conservative approach needs a longer healing period and good patient cooperation. However, it has marked advantages: it is minimally invasive; there are no severe complications (such as infection; and it conserves bone and important anatomic structures, especially in young patients [3].

In our case, we chose a decompression technique to decrease the size of the cyst so as to prevent the occurrence of bone defect and damage to important oral structures, such as the inferior alveolar nerve and mandibular canal. In addition, the marsupialisation technique reduces the chance of a pathological fracture or bone discontinuity. Nevertheless, during the decompression process, the irrigated area needs to be plugged with gauze. The operative wound might also be slow to heal.

In comparison with traditional decompression techniques, we suggest used a customised appliance. It was easy to apply. The patient or his/her parents can irrigate the area and daily recalls are



Figure 9. Increased bone density and bone trabeculation after 1 year.

not necessary. In addition, it can be converted into a space retainer to prevent space loss.



Figure 10. Removable appliance converted to lingual arch.



Figure 12. Intraoral view showing successful healing.



Figure 11. Panoramic view showing successful healing and ossification of the bone defect (2 years postoperatively).

At the monthly follow-ups, our removable appliance with a resin projection was adjusted according to healing of the cyst and

bone growth. The resin projection was used to decompress the cystic lesion and to prevent the entry of food debris into the cyst cavity. It also prevented the formation of fibrous tissues. The appliance was not used only as an obturator; it also served as a space maintainer. The cooperation of the patient and parents was fundamental to the success of the treatment, as they complied with the postoperative oral hygiene measures fully.

The bone defect ossified without complications. No signs of persistence or recurrence of the cyst were seen. Regular follow-up is still necessary to evaluate the need for orthodontic treatment.

Conclusion

Depending on the size and location of the dentigerous cyst, the age of the patient, and relationship to vital structures, conservative treatment is a useful treatment modality for an extensive dentigerous cyst.

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