Journal of Advances in Medicine and Medical Research

33(20): 170-175, 2021; Article no.JAMMR.74625
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

Dentigerous Cyst Associated with a Misaligned Maxillary First Premolar: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. Authors HD and SF helped in clinical examination. Author HD managed the surgical work. Authors HD, SF and AB prepared, reviewed and edited the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2021/v33i2031119
Editor(s):
(1) Dr. Rameshwari Thakur, Muzaffarnagar Medical College, India.
Reviewers:
(1) Alexandre Simões Garcia, University of São Paulo, Brazil.
(2) M. Sesha Reddy, Gulf Medical University, United Arab Emirates.
Complete Peer review History: https://www.sdiarticle4.com/review-history/74625

Case Study

Received 28 July 2021
Accepted 04 October 2021
Published 09 October 2021

ABSTRACT

Aims: The main goal of the following case report was to shed the light on the importance of thorough clinical, radiological and histological examinations in order to elaborate a final diagnosis of asymptomatic dentigerous cysts detected in unusual locations.
Presentation of Case: A case of dentigerous cyst was identified accidentally in the maxillary left premolar region of an asymptomatic 14-year-old female post an orthodontic consultation. Histological examination of the tissue specimens following enucleation confirmed the diagnosis of a dentigerous cyst.
Discussion: Dentigerous cysts are the second most common odontogenic cysts after radicular cysts. They involve impacted, un-erupted, permanent, supernumerary, odontomas and rarely deciduous teeth. Dentigerous cysts are usually painless but may cause facial swelling and delayed tooth eruption. Extensive maxillary involvement and childhood presentation are rare. Radio-graphic and histological examinations should be done to confirm the diagnosis of a dentigerous cyst.
Conclusion: In our case, we showed the presence of a maxillary premolar dentigerous cyst that was removed by enucleation. The presence of dentigerous cyst is not always associated with a syndrome and its removal is very important to avoid future complications.

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Keywords: Asymptomatic; dentigerous cyst; enucleation; maxillary premolar.

1. INTRODUCTION

Dentigerous cysts count for the most common developmental cysts in the jaws, and possess the second highest occurrence rate in the oro-maxillofacial region following radicular cysts [1]. Dentigerous cyst, also referred to as follicular cyst, results from follicle separation from around the crown of an un-erupted tooth, provoking the accumulation of fluid in between the reduced enamel epithelium and the surface of a developed tooth's enamel. Its incidence was found to be high in men with a ratio of 1.6:1 [2]. Dentigerous cyst is most often associated with un-erupted teeth located especially in the posterior mandibular region (third molars), maxillary canines and mandibular premolars. It was reported that less than 0.5% of dentigerous cysts was associated with un-erupted or impacted maxillary premolars [3].

An unusual dentigerous cyst case associated with a misaligned left maxillary premolar in a young female patient is presented in the following case report.

2. CASE REPORT PRESENTATION

A 14-year-old girl was referred by her orthodontist, whom she visited after she noticed a gradual misalignment of the teeth, to our private clinic due to a crowding in the left maxillary premolar area. The patient had no history of trauma. At the time of her visit, the patient was asymptomatic with no facial asymmetry. The clinical examination did not detect any intraoral bone swelling in the vestibule of the left premolar region. No inflammatory signs were observed in the overlying mucosa. All permanent teeth were present in the arch in addition to being immobile and free from caries.

An extensive range of investigations were carried out.

An orthopantomography (OPG) was carried out 2 weeks before the surgery to confirm the extent of the cystic lesion. The former showed a well-defined radiolucent lesion which extended from the canine's distal part to first permanent molar mesial part. It was hard to assess whether the lesion margins were attached to the neck of the first or the second premolar (Fig. 1). Both premolars were included in the radiolucency showing fenestration of the cortical bone at this area. The deciduous canine present in the arch was shed out before the surgery time.

With the aim of further analysis of the lesion and its extension, a cone beam computed tomography (CBCT) was carried out (Fig. 2A). CBCT offers a three-dimensional reproduction of images with minimum distortion allowing better diagnosis and treatment planning leading to more effective results [4]. CBCT imaging confirmed an unusual well-defined hypodense cystic lesion in the alveolar cortex of the maxilla in the region of the first and second premolars measuring approximately 1x1x2 cm. The lesion was found to cause fenestration in the buccal cortical bone with a significant resorption of the palatal cortex without any alteration of the floor and anterolateral region of the maxillary sinus (Fig. 2 A and B).

Fig. 1. Preoperative orthopantomography

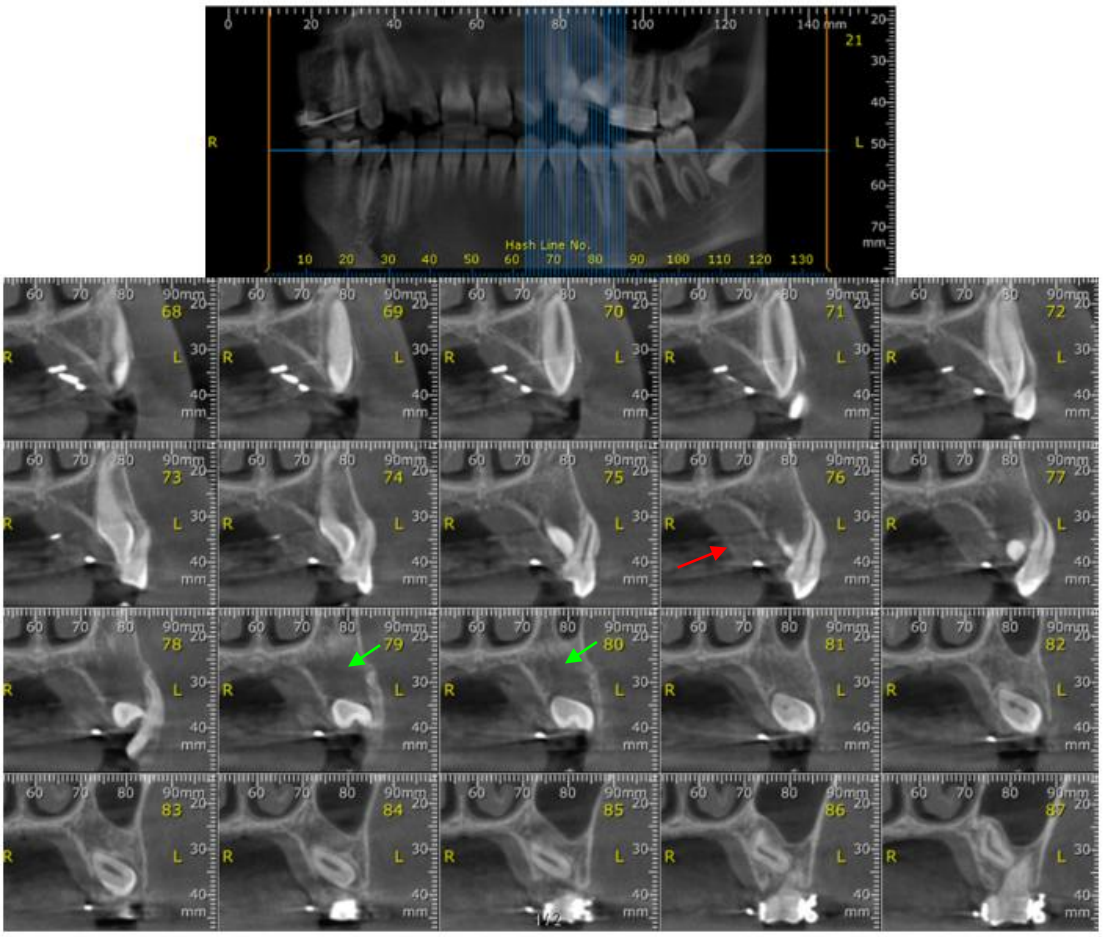

Fig. 2A. CBCT image, coronal slices, from the mesial side of the left maxillary canine (cut number 68) to the mesial side of the maxillary left first molar (cut number 87), showing the resorbed palatal cortex (red arrow) as well as a minor fenestration in the buccal plate of bone (green arrow)

Fig. 2B. Fenestration of the buccal cortical bone after extraction of the first maxillary premolar

With an informed consent, and under local infiltration using articaine with epinephrine 1/100000, the first maxillary premolar of the left side was extracted (Fig. 2 C), followed by an intrasulcular incision, extending from the mesial side of the canine till the mesial side of the second permanent molar that was done without release.

Fig. 2C. Extracted maxillary first premolar

Fig. 2D. Flap closure

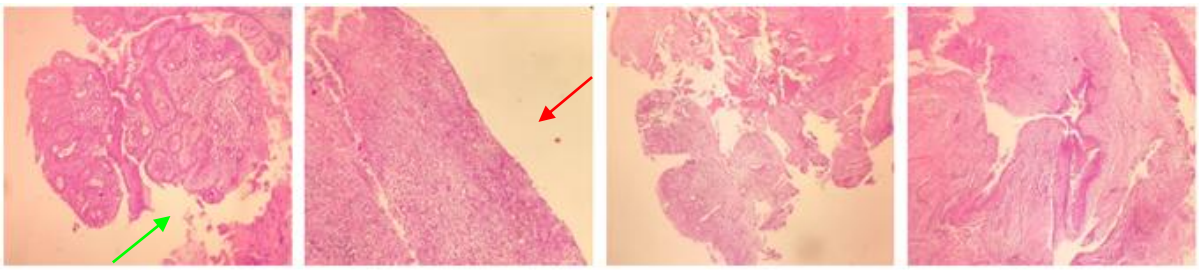

Fig. 3. Photomicrographs showing the cystic lesion lined by non-keratinized squamous epithelium (red arrow) and cystic lumen (green arrow)

A very thick enveloped mucoperiosteal flap was elevated to expose the lesion. A thin buccal cortical bone was still present and thus a small osteotomy was done using a piezon master surgery (EMS Medical, Switzerland). A bony bridge was preserved apical to the osteotomy (Fig. 2 B). The cystic lesion was completely enucleated and removed using Lucas curette #85 (Hue-Friedy) and placed in a formol fixation solution for a histopathological analysis. The flap was sutured using 4.0 absorbable braided and coated synthetic suture made of polyglactin 910 (Novosyn, B. Braun Surgical, S.A.) (Fig. 2 D).

Microscopic examination has revealed a dentigerous cyst (Fig. 3). Several layers of stratified non-keratinized squamous epithelium similar to reduced enamel epithelium were found to form the cystic lining of the lesion. A capsule made up of connective tissue, collagen fibers, fibrous stroma, and blood vessels in addition to few inflammatory cells was also detected on

Fig. 4. Post-operative Orthopantomography

microscopic examination. These whole observations led to confirm the diagnosis of dentigerous cyst.

3. OUTCOME AND FOLLOW-UP

The patient was followed up for a period of six months. The post-operative phase went smoothly (Fig. 4). In order to restore the missing space previously occupied by the first maxillary premolar, the patient was advised to continue her treatment with an orthodontist after healing.

4. DISCUSSION

A dentigerous cyst surrounds the crown of an unerupted tooth, expands the follicle, and is connected to the tooth's cementoenamel junction. The mandibular and maxillary third molars, as well as the maxillary permanent canines, are the most frequently affected, followed by both mandibular premolars and, in rare cases, maxillary premolars. Dentigerous cysts affecting the maxillary premolar occur at a rate of 2.7 percent, compared to 45.7 percent in the mandibular third molar [5]. According to Daley TD et al. [6], the incidence of dentigerous cyst involving premolars ranges from 0.1 to 0.6 percent. However, a higher incidence (1.5 percent) was detected by Shear M et al. [7].

The unusual location of a dentigerous cyst is revealed in this case report.

The breakdown of the proliferating cells of the follicle after impaired eruption may be the cause of a dentigerous cyst. As a result of the breakdown of components, osmotic pressure rises, eventually leading to cyst formation [8].

Dentigerous cyst can be found in an inflammatory form, known as follicular inflammatory cyst, due to inflammation in a non-vital deciduous tooth, or non-inflammatory form resulting from the erupting tooth's pressure on an impacted follicle [9]. On radiographs, dentigerous cyst appears as a well-defined unilocular radiolucency surrounding the crown of an impacted tooth, frequently with a sclerotic radiopaque border [10, 11]. Moreover, it can be classified, according to radiographs, into three types: central, lateral, and circumferential [5]. The cyst in our case was of the central type, and it appeared as a unilocular radiolucency with a well-defined sclerotic border enveloping the crown of the first maxillary premolar. The differential diagnosis of a dentigerous cyst includes unicystic ameloblastoma, odontogenic keratocyst, adenomatoid odontogenic tumor (AOT), ameloblastic fibroma and fibro-odontoma as well as early stages of Gorlin cyst [12].

Actually, unicystic ameloblastoma, ameloblastic fibroma as well as odontogenic keratocysts are most commonly located in the posterior region of the mandible whilst AOT, ameloblastic fibro-odontoma and Gorlin cysts show more tendency to occur in the anterior region of the maxilla [13].

Marsupialization is very preferable to erupt the tooth involved in the dentigerous cyst especially if it is in a favorable location [14-16].

In our case, the maxillary premolar was in a different position in addition to lacking complete roots. Thus, enucleation was carried out along with tooth extraction.

5. CONCLUSION

When young patients present painless, sluggish, and expanding lesions, particularly when

permanent teeth are missing, benign odontogenic tumors or odontogenic cysts may be the cause of their non-erupting conditions. However, they may also be linked to a complex syndrome. In order to resolve these perplexing conditions and provide adequate care, a comprehensive clinical and radiological review should be performed.

CONSENT

Written informed consent was obtained from the patient.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle4.com/review-history/74625