



CASE PRESENTATION

Dentigerous cyst in mandibular ramus in pediatric patients: a case report and review of the literature

Quiste dentígero en rama mandibular en pacientes pediátricos: reporte de un caso y revisión de la literatura

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ABSTRACT

Introduction: the dentigerous cyst or follicular cyst is a pathological cavity that develops inside the maxillary bone tissue, it is the second most common type of odontogenic cyst, it is found surrounding the crown of an unerupted tooth omitting the root or roots of said structure. Histologically it presents a capsule of fibrous connective tissue weakly fixed, with small islands or cords of odontogenic epithelium.

Objective: to present a clinical case and review of the literature on a dentigerous cyst in the mandibular ramus in a pediatric patient.

Methods: a literature search was performed in the databases of Elsevier, PubMed, Scielo as well as literatures from 2019 to 2023 documented in reference to case reports. In order to choose the clinical case, it was decided to work with the study of a rare oral pathology in pediatric patients such as the dentigerous cyst; for which a novel surgical technique is sought to be identified.

Results: the present clinical case corresponds to a 12 year old female patient who comes to the oral surgery department presenting pain in the mandibular region on the right side of one year of evolution, clinically at the extra oral examination there is evidence of slight facial asymmetry due to unilateral increase of volume, at the intraoral examination there is absence of dental pieces.

Conclusions: dentigerous cyst is a rare dental pathology, but it can have important repercussions if not treated in time; therefore, its early diagnosis and treatment are essential to avoid complications.

Keywords: Dentigerous Cyst; Tooth Eruption; Pathology Clinical.

RESUMEN

Introducción: el quiste dentígero o quiste folicular es una cavidad patológica que se desarrolla en el interior del tejido óseo maxilar, es el segundo tipo más común de quiste odontogénico, se encuentra rodeando la corona de un diente sin erupcionar omitiendo la raíz o raíces de dicha estructura. Histológicamente presenta una cápsula de tejido conjuntivo fibroso fijado débilmente, con pequeñas islas o cordones de epitelio odontogénico.

Objetivo: presentar un caso clínico y revisión de la literatura sobre un quiste dentígero en rama mandibular en paciente pediátrico.

Métodos: se realizó una búsqueda de la literatura en las bases de datos de Elsevier, PubMed, Scielo como también literaturas del 2019 al 2023 documentado en referencia a reportes de caso. Para la elección del caso clínico se decidió trabajar con el estudio de una patología oral poco frecuente en pacientes pediátricos como es el quiste dentígero; para lo cual se busca identificar una técnica quirúrgica novedosa.

Resultado: el presente caso clínico corresponde a una paciente femenina de 12 años quien acude al departamento de cirugía oral presentando dolor en la región mandibular de lado derecho de un año de evolución, clínicamente al examen extra oral se evidencia ligera asimetría facial por aumento de volumen unilateral, al examen intraoral se observa ausencia de las piezas dentales.

Conclusiones: el quiste dentígero es una patología odontológica poco frecuente, pero que puede tener repercusiones importantes si no se trata a tiempo; por lo tanto, su diagnóstico y tratamiento precoz son esenciales para evitar complicaciones.

Palabras clave: Quiste Dentígero; Erupción Dental; Patología Clínica.

INTRODUCTION

The dentigerous cyst or follicular cyst is a pathological cavity that develops inside the tissue, it is the second most common type of odontogenic cyst, the crown of an unerupted tooth is surrounded by an epithelial wall, omitting the root or roots of said structure.⁽¹⁾

Epidemiologically, the incidence of dentigerous cysts is 20 % and are rare in pediatric patients, with a childhood incidence of 4 % to 9 %. Treatment is still a matter of debate as to whether or not it preserves teeth.^(2,3)

Its origin is associated with the alteration of the enamel epithelium after the complete formation of the crown and by the accumulation of liquid between the reduced enamel epithelium of the dental organ tissue and its crown. They are usually present in the mandible to a greater extent than in the maxilla, and are mainly observed in the lower third molars and upper canines. In the mandible, in the molar area, an almost complete reabsorption of the ascending ramus may occur, with the displacement of the molar. In the maxilla, in the canine region, it causes expansion of the anterior portion of said maxilla and may resemble cellulitis or sinusitis. It can also evolve towards the nasal passages and the pterygomaxillary fossa, causing pain and infection and sometimes suppuration and fistulas to the exterior.⁽²⁾

Dentigerous cysts develop slowly and may go unnoticed for years. These lesions usually have a variety of different signs and symptoms such as facial asymmetry, scattered teeth, lesions of the adjacent tooth root, among others; thus affecting the attached anatomical structures.⁽¹⁾

Histologically, it presents a capsule of weakly fixed fibrous connective tissue, with small islands or cords of odontogenic epithelium, lined by non-keratinized stratified squamous epithelium. The long-standing dentigerous cyst may present dysplastic changes in its epithelial lining.^(1,2,3,4)

There are several radiographic techniques, including traditional 2D, periapical, occlusal, and panoramic radiographs that allow observation of their occurrence. Radiographically, dentigerous cysts present as well-defined unilocular radiolucent areas associated with intact crowns. Additional radiographic features include displacement of the mandibular canal, resorption of the mandibular canal wall, root resorption of adjacent permanent teeth, and the possibility of pathologic fracture. Tooth roots associated with cysts rarely resorb and are more likely to become displaced as the cyst enlarges.⁽⁵⁾

Diagnosis is difficult because most do not present painful symptoms and grow slowly. When they are large, these cysts can cause facial edema due to the expansion of the cortical bone. They can also hinder the eruption of neighboring teeth and even promote impaction of these. To obtain an accurate diagnosis of the lesion, many characteristics collected in the clinical, radiographic and histopathological examination must be considered. Diagnostic factors are obtained through the anamnesis, clinical examination and the use of diagnostic tools. All these studies provide data to establish a differential diagnosis that allows the identification of this lesion and, together with the histopathological study, allows a definitive diagnosis.⁽³⁾ The differential diagnosis includes keratocyst, unicystic ameloblastoma, adenomatoid odontogenic tumor and ameloblastic fibroma.⁽⁴⁾

Treatment for dentigerous cysts includes marsupialization, enucleation, and/or curettage; this is used for cysts that have affected significant parts of the jaw. This can help preserve vital structures by helping to promote bone regeneration, which in turn reduces the size of the bone defect caused by the dentigerous cyst.⁽⁴⁾

Complications associated with dentigerous cysts include: extensive bone destruction, displacement of anatomical structures, pathological fracture or secondary infection, among others. These complications occur when the cyst reaches significant dimensions due to cystic atonement factors: epithelial proliferation, accumulation of cellular contents, hydrostatic growth, bone resorption factor and intracapsular enzymatic activity.⁽⁴⁾

METHODS

For the development of this article, a literature search was carried out in the Elsevier, PubMed, and Scielo databases, as well as literature from 2019 to 2023, documented in reference to case reports. For the selection of the clinical case, it was decided to work with the study of a rare oral pathology in pediatric patients, such as dentigerous cysts; for which a novel surgical technique is sought to be identified.

Inclusion criteria

Articles in English or Spanish.
Articles published within the period: 2019 – 2023.
Articles published in high-impact scientific journals.
Articles with broad relation to the present research topic.

Exclusion criteria

Articles whose content could not be directly accessed.
Articles that were not useful for the topic of study.
Articles published outside the period established as a research parameter.
Duplicate Articles

RESULTS

This is the clinical case of a 12-year-old female patient, born and resident in the city of Ibarra, a primary school student; who comes to the oral surgery service with her mother for a specialty evaluation, presenting pain in the mandibular region on the right side for approximately two years and which has intensified in the last week, 8/10 on the EVA scale.

Clinically, the extraoral examination shows slight facial asymmetry, isochoric, normoreactive pupils with preserved ocular acuity and motility, a patent nose to the passage of air. The intraoral examination shows the absence of teeth 18, 28, 38 and 48, tooth number 37 in the process of eruption, negative forceps test for the maxilla and mandible, preserved mouth opening of approximately 35 mm and stable occlusion.

The tomographic examination (Figure 1) in axial, coronal and sagittal sections plus 3D reconstruction shows circumscribed radiolucent shadows of approximately 25 mm in a longitudinal direction and 15 mm in a transverse direction in the mandibular ramus on the right side in relation to retained piece 38, radiolucent shadow compatible with retained supernumerary tooth between pieces 11 and 21, patent maxillary sinuses, condyles in position fulfilling function. Due to these findings, the patient is protocolized to perform a surgical enucleation of the lesion and dexamethasone 4 mg intravenous is administered one hour before surgery.

Surgical Technique

Under local anesthesia of the right mandibular trunk with 2 % lidocaine plus epinephrine 1:80000, after asepsis and antisepsis with 0.12 % chlorhexidine solution, sterile fields were placed in a protocol-based manner. An exploratory fine needle puncture was performed, from which a citrus-colored liquid content was obtained with a collection of approximately 2 cc, subsequent linear incision with discharge at the level of piece 47 in the retromolar region on the right side, with a periosteum a mucoperiosteal flap was lifted, enucleation of the retained dental organ was performed using a straight elevator technique, an excisional sample of the lesion was taken which was placed in 10 % formalin and sent to a private laboratory for histopathological examination, (Figure 2, 3 and 4), finally, curettage of the surgical bed was performed and Carnoy's solution was applied for five minutes and subsequent washing with saline solution, hemostasis was controlled and sutured with 3/0 silk with simple stitches; The patient goes to the recovery room without complications, where a 30 mg ampoule of ketorolac and 4 mg of dexamethasone intravenously STAT are administered. Additionally, 500 mg of

amoxicillin is prescribed at home every eight hours for seven days, as well as general instructions for post-surgical care and monitoring in 10 days for removal of stitches.



Fig. 1 Tomographic examination

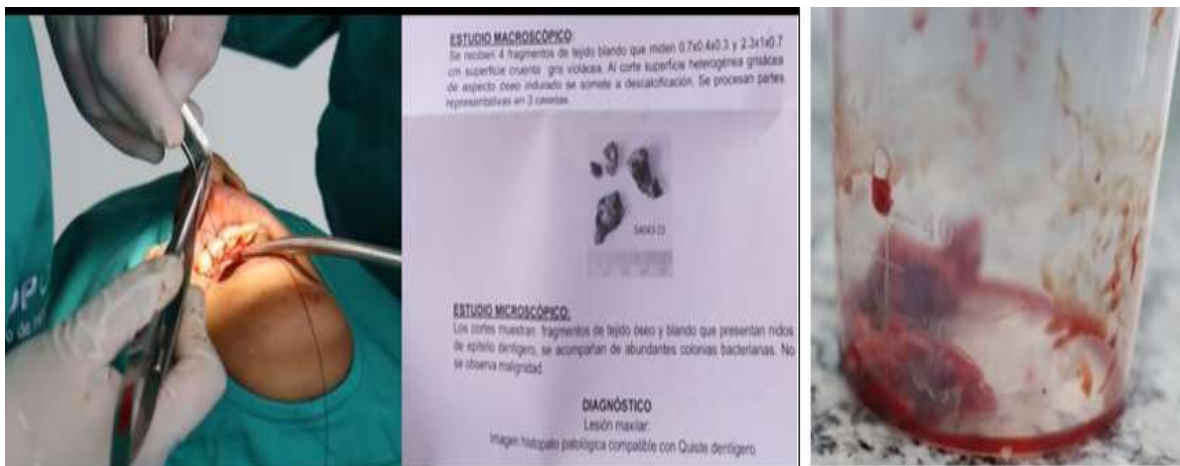


Fig. 2 Surgical Technique.

Post-operative care of the enucleation technique

In the immediate postoperative period, the patient was instructed to keep the surgical bed completely clean by irrigating twice a day with 60 cc of 0,9 % saline solution. In addition, mouthwash with 0,12 % chlorhexidine was prescribed twice a day for 10 days and to maintain adequate oral hygiene. A follow-up was performed in six months, where the absence of recurrence and complete bone formation could be seen.



Fig. 3 Complete bone formation

DISCUSSION

A cyst is defined as a pathological cavity lined by an internal epithelium filled with liquid or semi-liquid. The separation of the follicle from the crown of an impacted tooth culminates in a cystic formation called a dentigerous cyst, which is why it is associated with the crown of an unerupted tooth. It can cause dilatation of the bone cortex and cause facial asymmetry. Radiographically, it is characterized in most cases by a well-defined and asymptomatic unilocular radiolucent area, which is detected by radiographic examinations. All the clinical/radiographic findings mentioned above were observed in the clinical case mentioned.⁽⁶⁾

Differentiating a dentigerous cyst from an adenomatoid odontogenic tumor (AOT) is difficult when the tumor is follicularly related to an unerupted tooth (follicular variant). A characteristic that can help distinguish between these two lesions is that the radiolucency in the AOT usually extends apically along the root beyond the cemento-enamel junction, while in the dentigerous cyst it joins the tooth at that location. In addition, the AOT sometimes contains small radiopacities that can also be useful for the differential diagnosis with the dentigerous cyst. In some cases, obtaining an imaging diagnosis is difficult, since the calcifications are usually minimal. However, the calcifying cystic odontogenic tumor (COT), like the dentigerous cyst, radiographically presents as a pericoronal radiolucent image that usually does not extend beyond the cemento-enamel junction.⁽⁶⁾

The extrafollicular variant of TOA, when it does not present calcifications and depending on its intramaxillary location, may present a radiographic appearance very similar to that of cystic lesions. When it shows an apical relationship with an erupted tooth, it may resemble a radicular cyst, in its absence, a residual cyst, and, if it is located between the roots of the teeth, it may resemble a lateral periodontal cyst. It may also show no relationship with erupted or retained dental structures and, in some cases, may appear radiographically to be more aggressive pathologies such as unilocular keratocystic odontogenic tumor or unicystic ameloblastoma. The dentigerous cyst is an odontogenic cyst that generally affects retained teeth, usually canines and third molars.⁽³⁾

The treatment of dentigerous cysts includes enucleation, some authors believe that enucleation is the best form of treatment in pediatric patients.⁽²⁾ However, many authors suggest more conservative treatments such as dissection with temporary drainage, for gradual reduction of the cyst and bone regeneration.⁽¹⁾ Some authors also consider marsupialization to be the best option for the treatment of dentigerous cysts in children, they consider that this treatment modality is a conservative option, in addition to preserving vital structures, it is important to highlight that it also favors the eruption of dentinal elements.

Several authors attest that during surgical treatment of dentigerous cysts, the deciduous teeth associated with the lesions need to be removed. For permanent teeth involving the dentigerous cyst, 25 % of cases were treated by enucleation of the lesion and extraction of the associated tooth.⁽²⁾

CONCLUSIONS

Dentigerous cysts are a rare dental pathology, but they can have important repercussions if not treated in time. Therefore, early diagnosis and treatment are essential to avoid complications. The ideal treatment depends on the type and extent of the pathology. The choice of treatment for dentigerous cysts must take into consideration factors such as: size of the lesion and proximity to the noble anatomical structures. As well as, consider the viability of the teeth involved in the lesion. Surgical treatment through enucleation and extraction of the elements involved proved to be fast and effective, showing that the choice of treatment must be carefully evaluated.

Declaration of conflict of interest

The authors declare that there are no conflicts of interest.

Authors' contributions

All authors participated in conceptualization, data curation, formal analysis, investigation, methodology, supervision, writing-original draft, writing-review, and editing.

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