

Surgical Approach of Maxillary Cysts in Pediatric Patients: Report of Two Clinically Similar Cases with Different Diagnosis

Abordaje Quirúrgico de Quistes Mandibulares en Pacientes Pediátricos:
Reporte de Dos Casos Clínicamente Similares con Diagnóstico Diferente

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PEREIRA FALCÃO, A.; DRAGONETTI GIROTTI, L.; PAULINO MAZZON, J. P.; BALANGIO, L. A. & BORGES VENTURI, L. Surgical approach of maxillary cysts in pediatric patients: Report of two clinically similar cases with different diagnosis. *Int. J. Odontostomat.*, 18(2):135-140, 2024.

ABSTRACT: Extensive odontogenic cysts in children may represent surgical challenges, as they may have common clinical characteristics and different approaches. The main objective of this study is to compare two cases of pediatric odontogenic cysts in maxilla with similar surgical treatment and different histopathological diagnosis. The case series collected included two children, both 12 years old, with encapsulated osteolytic lesions in the region of the maxilla and zygoma body, with clinical and imaging characteristics that suggested odontogenic cysts. The histopathological diagnosis was dentigerous cyst and radicular cyst. In this way, we address the clinical-surgical diagnostic and therapeutic process adopted, analyzing clinical data, such as signs and symptoms, as well as pre- and postoperative tomography scans. Outpatient visits at regular intervals were planned. Both patients achieved significant regression of initial signs and symptoms and returned to their daily activities. It is noticeable that a good stratification of surgical need and planned action in diagnosis and surgery offer benefits with a favorable prognosis for pediatric odontogenic cysts of the jaw.

KEY WORDS: odontogenic cysts, dentigerous cyst, radicular cyst, maxillofacial surgery.

INTRODUCTION

Odontogenic cysts are traditionally divided by their etiology into inflammatory and developmental. Among the inflammatory ones, the radicular cyst (RC) is the one with the highest incidence in the literature, it usually appears between the third and sixth decades of life and mostly in the maxilla, with slow growth (Deshmukh *et al.*, 2014). In parallel, there is literature that supports the preference of radicular cysts for the posterior region of the mandible. The dentigerous cyst (DTC), in turn, is the most common among developmental cysts, has a higher incidence between the first and third decades of life and has a statistically greater involvement with lower third molars and upper canines (Vaz *et al.*, 2010). Therefore, the reported incidence of radicular and dentigerous cysts in childhood, especially with primary teeth involved, is considered uncommon and low (Pozzer *et al.*, 2009).

There is a consensus that odontogenic cysts of the jaw usually appear on imaging tests as unilocular

and close to teeth. At the same time, ossifying fibromas, keratocysts, unicystic ameloblastoma, adenomatoid odontogenic tumor and giant cell tumors may present similar characteristics to them. Therefore, the union of clinical and imaging data is essential for defining a therapeutic strategy (Pozzer *et al.*, 2009; 3 de Souza Batista *et al.*, 2015).

Clinicopathological diagnosis is important in the treatment of jaw cysts, given that clinical, imaging and histopathological differences can influence treatment. Cortical expansion, edema, asymmetry, tooth movement and root resorption are well-defined changes in the literature (Deshmukh *et al.*, 2014). Among the surgical treatment modalities, there are decompression, marsupialization and enucleation, and in pediatric patients there are efforts to avoid the extraction of permanent teeth (Pozzer *et al.*, 2009; Vaz *et al.*, 2010; Deshmukh *et al.*, 2014; Tian *et al.*, 2019). As a non-surgical modality for inflammatory cysts,

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especially CR, the literature places endodontic treatment with follow-up as an option, depending on the analysis of lesion dimensions, tooth location and proximity to noble structures, such as the maxillary sinus (Deshmukh *et al.*, 2014; Talpos-Niculescu *et al.*, 2021). The literature also indicates endodontic treatment after the surgical treatments implemented, given the intraradicular infectious nature of the teeth involved and the induction of an inflammatory and cystic osteolytic process (Bando *et al.*, 1993; de Souza Batista *et al.*, 2015).

The risk of concomitant secondary cystic infection must be taken into account, which may imply the need for administration of antibiotics and other clinical-surgical measures (Caliento *et al.*, 2013). The pediatric population presents an unusual frequency of incidence of cysts in the maxilla depending on their diagnosis, however the treatment can be similar even with different histopathological results. Thus, factors such as age, presence of cavities, previous endodontic treatment, delay in eruption and associated impacted teeth must be considered to differentiate CRs from DTCs (Sohn *et al.*, 2022).

she had noticed an increase in facial volume in the last 20 days. An incisional biopsy was performed and sent to pathology; subsequent analysis showed a dentigerous cyst. The proposed surgical treatment was cystic enucleation. Under general anesthesia, after installing a dental retainer, 2 % lidocaine with 1:100000 epinephrine was administered in the region at the bottom of the upper vestibular groove on the right side. Then, the attached gum was incised and was applied a relaxing incision. Flap disclosure allowed exposure of the cystic capsule, which was detached from the cortical bone.



Fig. 1. A. Preoperative photo show increased malar volume. B. 1 year follow-up. Regression of edema.

CASE REPORTS

Case 1. A 12-year-old female patient presented to our Oral and Maxillofacial Surgery outpatient clinic with moderate swelling of a stony appearance in the right zygomatic region, with anteroposterior facial asymmetry, local erythema, mild pain and paresthesia (Fig. 1A). On intraoral examination, mild swelling was noted at the bottom of the maxillary groove covered by normal-colored mucosa and tooth mobility of deciduous teeth 54 and 55. Computed tomography of the face (CT) showed extensive bone rarefaction that included alveolar processes and bones of the right maxilla and zygoma, invading the maxillary sinus and groping the orbital floor. There was an ectopic tooth lodged in a region close to the right orbital floor (Fig. 2 A, B).

The child's guardian reported that she had seen a private dentist, who prescribed Amoxicillin with Clavulanate and had been symptomatic for 5 days, which apparently reduced painful symptoms and local erythema, and that

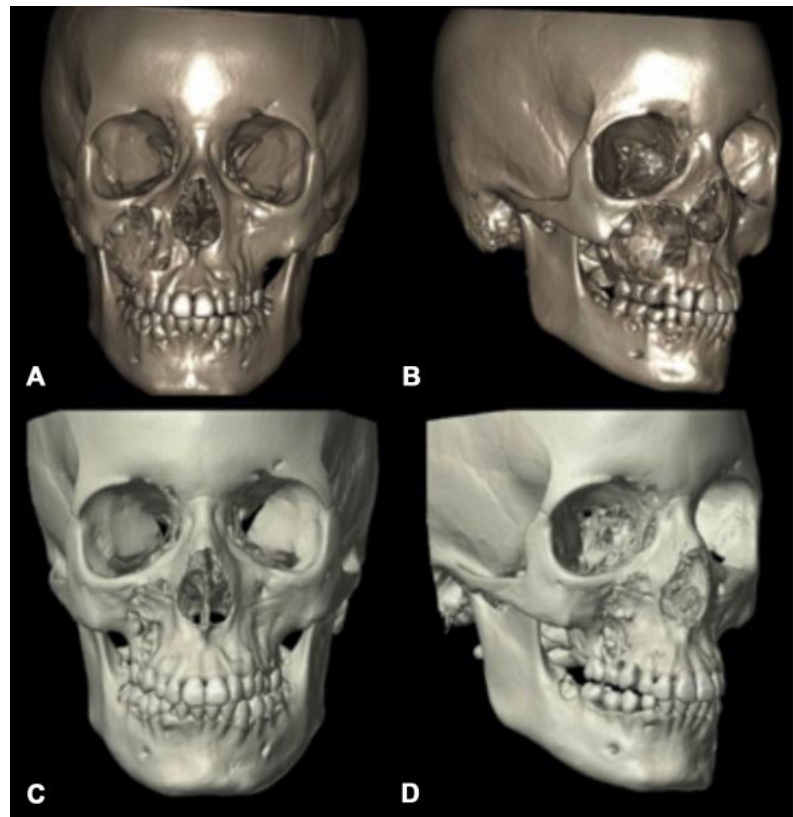


Fig. 2. A. preoperative reconstruction in front view. B. preoperative reconstruction in 3/4 view. C. 1 year follow-up frontal reconstruction. D. 1 year follow-up in 3/4 side reconstruction.

The lesion was completely removed, along with the ectopic tooth, as well as the unhealthy white layer of jaw bone that covered the lesion. The cyst measured 5.0 x 3.4 x 1.2 cm, and was made up of brownish, elastic tissue (Fig. 3). Edge regularization was done using a bone file and an osteotomy drill. Sutures with absorbable polyglactin thread were performed, restoring the morphology of dental papillae. The material was sent for pathology, whose analysis demonstrated a dentigerous cyst. The patient was discharged, returning to the outpatient clinic periodically. Regression of signs and symptoms at admission and ongoing bone formation was demonstrated, and the child was able to return to her school routine. In the control tomography scans, we observed a lamellar bone formation interspersed with content of probable liquid-mucosal characteristics in the right maxillary sinus. At the 1-year consultation (Fig. 1B), there was a report of a significant improvement in paresthesia – which was already observed to be ongoing in recent visits – and a reduction in local pain, as well as signs of continuity of bone formation (Fig. 2C,D). The patient stay monitored in our service. As a limitation of this case, we requested endodontic evaluation of the teeth involved, but the person responsible for the child was unable to receive care during this one year of follow-up.



Fig. 3. Removed lesion with inserted ectopic tooth evaluated and measured. We also observed a bone plate extracted from the anterior wall of the maxillary sinus.

Case 2. A 12-year-old male patient presented to our outpatient clinic with asymmetric swelling in the left zygomatic region that had started three and a half months ago. On intraoral examination, an increase in volume in the region of the bottom of the sulcus, attached gums and hard palate added to the pain and occlusal changes (Fig. 4 A,B). Facial tomography demonstrated an expansive lesion that generated bulging of the buccal-palatal cortices and invaded the maxillary sinus and nasal fossa, in addition to promoting

displacement and mobility of teeth 21, 22 and 23. The lesion demonstrated a very oval capsule when it entered the maxillary sinus (Fig. 5 A,B).

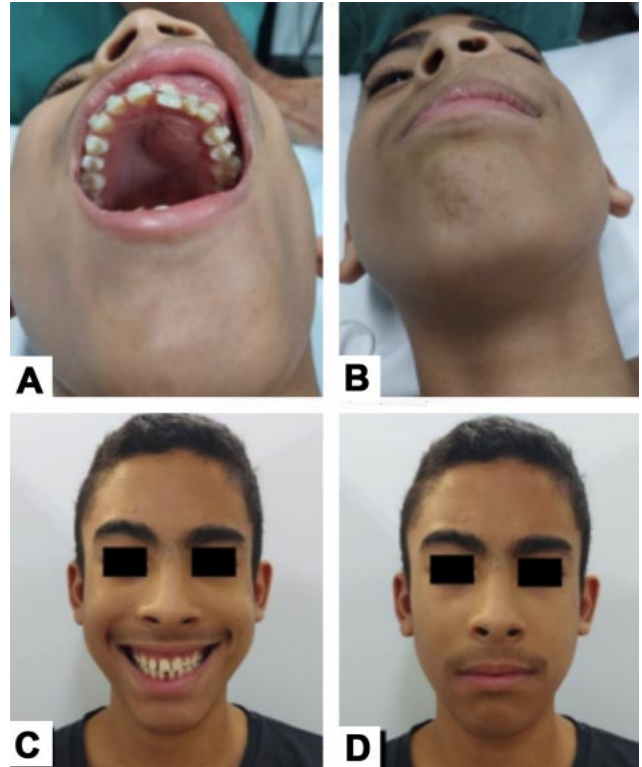


Fig. 4. A. Preoperative intraoral appearance with increased palatal and buccal volume. B. preoperative bottom view with visible asymmetry. C. 1 year follow-up, smiling. D. 1 year follow-up, complete regression of edema

As in case 1, an incisional biopsy was initially sent for anatomopathological analysis and a report of a radicular cyst was returned. The treatment implemented was cystic enucleation under general anesthesia, after installing a dental retainer. 2% lidocaine with 1:100000 vasoconstrictor was infiltrated. The exposed lesion, through an intrasulcular incision with relaxant, was divided (Fig. 6), also presented yellowish liquid and was completely removed, measuring 4.0 x 3.5 x 1.5 cm in its longest axes. An extensive area previously occupied by the lesion had its walls curetted and tapered. Intraoral sutures with absorbable polyglactin thread were performed. The material was sent for histopathological analysis, which revealed a diagnosis of a radicular cyst. After being discharged from hospital, the patient remained for one and a half months with a dental retainer in his mouth, given significant tooth mobility. Endodontic treatment was also carried out in a service outside ours, by a professional endodontist. The patient returned periodically, with regression of the increase in facial volume and gingival.

Facial CT scans were performed to monitor bone formation. We noticed good bone formation underway in the maxillary sinus wall, palate and alveolar process. In the walls of the maxillary sinus

we observed bone lamellar formation and probable liquid-mucosal content that obliterates its space. After 1 year, we observed significant aesthetic improvement (Fig. 4 C,D) and greater bone formation (Fig. 5 C,D). The patient achieved complete regression of clinical signs and symptoms; Furthermore, it denies complaints in this most recent return.

DISCUSSION

Osteolytic lesions in the jaw can have different diagnoses. Therefore, a good anamnesis that understands the history of the patient and the disease, as well as combining clinical and imaging data, is essential for hypothesizing. The final diagnosis of pathologies is defined by anatomopathological examination, however surgical treatment can be similar for different pathologies, as seen in this work and in the literature (Pozzer *et al.*, 2009; Deshmukh *et al.*, 2014; Weber *et al.*, 2019; Sohn *et al.*, 2022). Although we treated patients with different diagnoses in this study, cystic enucleation was used successfully to remove the lesion, allowing a good prognosis for the children evaluated.

Root cysts and dentigerous cysts have appearance characteristics that differentiate them: While the first is related to pulpal pathologies, in which there is contamination of the root canal by caries with a periapical lesion, being classified as an inflammatory cyst; DTC is classified as a developmental cyst, given its generally unrelated nature to inflammatory-infectious processes. At the same time, this does not mean that there cannot be secondary intralesional contamination in DTCs, but it defines their etiologies (Caliento *et al.*, 2013; Weber *et al.*, 2019; Sohn *et al.*, 2022). The literature classically demonstrates that DTCs grow adjacent to the cemento-enamel junction (CAJ), leading to the accumulation of fluid between the crown and reduced epithelium of the enamel organ, with third molars and canines being the teeth that have the highest incidence of this condition (Santos *et al.*, 2011; Caliento *et al.*, 2013; Sohn *et al.*, 2022). In our report, the DTC actually grew to encompass the JAC, but from a right upper premolar.

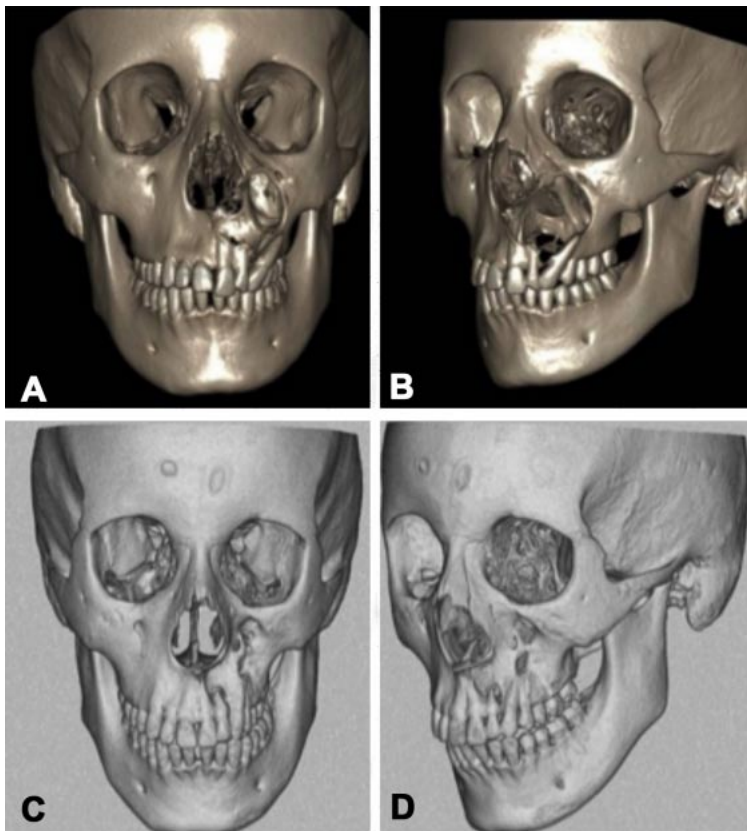


Fig. 5. Three-dimensional reconstruction of CT scans. A. preoperative front view. B. preoperative 3/4 view. C. postoperative front view. D. postoperative 3/4 view.

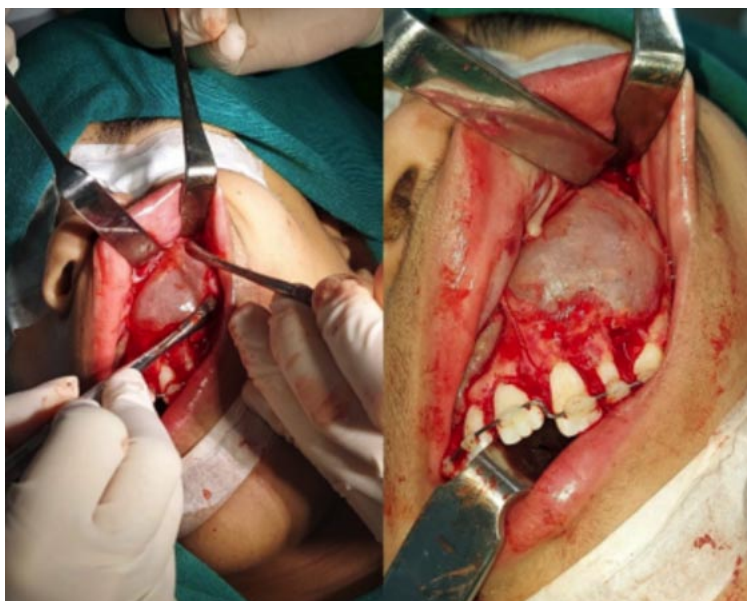


Fig. 6. Intraoperative lesional exposure.

Dantas *et al.* (2013) point out that there is a higher incidence of DTCs in the jaw and that they affect the population between 10 and 30 years old, which is compatible with the range of involvement of the first three decades of life that other publications demonstrate (Santos *et al.*, 2011; Caliento *et al.*, 2013). However, they reported two cases of extensive DTCs in the maxilla in 20-year-old men, which reinforces that reports of extensive lesions such as DTCs in the maxilla in pediatric patients are uncommon. In this context, the aforementioned authors opted for enucleation with curettage, presenting good results, without recurrences (Dantas *et al.*, 2013). The radicular cyst, in turn, is correlated with an inflammatory process of Malassez's epithelial remains in the periodontal ligament mainly due to pulp necrosis. Classically, a higher incidence in etiology is attributed to permanent dentition (Kesharwani *et al.*, 2020), which was compatible with the clinical picture of our Case 2 and the histopathological report. Enucleation is also proposed as an interesting option for cases of extensive radicular cysts, with a good prognosis. Furthermore, depending on the region, it may be possible to include grafts to aid osteogenesis (Seo *et al.*, 2018; Kesharwani *et al.*, 2020).

Thinning and disruption of bone cortices with bulging tissue are common signs in jaw cysts, as well as the presence of intralesional fluid that varies in color and density depending on the condition (Pozzer *et al.*, 2009; Santos *et al.*, 2011; Caliento *et al.*, 2013; Kesharwani *et al.*, 2020). In both cases, more yellowish liquid was observed. Postoperative clinical and imaging control was important to understand that there was significant bone formation in the previous areas of scalloping, and to demonstrate that the formation is continuous and takes a long time over months. The regression of the teeth mobility was satisfactory, which allowed a medium-term improvement in occlusion and food intake. Aesthetically, there was relocation of the tissues in the maxillary and zygomatic region, as well as decompression of the lateral wall of the nasal fossa, with its rectification, the initially compressed and misaligned region in the cases presented.

CONCLUSION

Our patients had a satisfactory evolution, having recovered their food intake and returned to their daily activities. Adequate therapy for extensive odontogenic cysts in the maxilla of children, especially radicular cysts and dentigerous cysts – evaluated in

this project – presents a good prognosis, if clinical, histopathological and imaging data are well evaluated. Therefore, a treatment sequence that considers risks and benefits of different surgical approaches must be individualized and implemented.

PEREIRA FALCÃO, A.; DRAGONETTI GIROTTI, L.; PAULINO MAZZON, J. P.; BALANGIO, L. A. & BORGES VENTURI, L. Abordaje quirúrgico de quistes mandibulares en pacientes pediátricos: reporte de dos casos clínicamente similares con diagnóstico diferente. *Int. J. Odontostomat.*, 18(2):135-140, 2024.

RESUMEN: Los quistes odontogénicos extensos en niños pueden representar desafíos quirúrgicos, ya que pueden tener características clínicas comunes y diferentes abordajes. El objetivo principal de este estudio fue comparar dos casos de quistes odontogénicos en mandíbulas de niños con tratamiento quirúrgico similar y diagnóstico histopatológico diferente. La serie de casos recolectada incluyó dos niños, ambos de 12 años, con lesiones osteolíticas encapsuladas en la región mandibular y cuerpo cigomático, con características clínicas e imagenológicas que sugerían quistes odontogénicos. El diagnóstico histopatológico fue quiste dentífero y quiste radicular. De esta manera abordamos el proceso diagnóstico y terapéutico clínico-quirúrgico adoptado, analizando datos clínicos, como signos y síntomas, así como tomografías pre y postoperatorias. Se planificaron visitas ambulatorias a intervalos regulares. Ambos pacientes lograron una regresión significativa de los signos y síntomas iniciales y regresaron a sus actividades diarias. Se destaca que una buena estratificación de la necesidad quirúrgica y una acción planificada en diagnóstico y cirugía ofrecen beneficios con un pronóstico favorable para los quistes odontogénicos de la mandíbula en pediatría.

PALABRAS CLAVE: quistes odontogénicos, quiste dentífero, quiste radicular, cirugía maxilofacial.

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