

DOI: 10.21802/acm.2021.2.1

THE RADICULAR CYST IN A CHILD – CASE REPORT

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Abstract. The most commonly occurring odontogenic cysts of the jaws are radicular cysts.

Causes of jaw cysts are different, numerous and depend on the type of cyst. The basic precondition for the occurrence of a cystic lesion is the previous presence of epithelial tissue at the site of future development of the cystic formation.

Radicular cysts are one of the most common odontogenic cysts and arise from epithelial so-called Malassez – residues in the periodontal tissue, as a consequence of inflammation of the pulp. They can occur at any age, and are equally prevalent in both sexes. The aim of this paper is to present the clinical symptoms and treatment of a radicular cyst in a 12-year-old child.

The treatment of radicular cysts in most cases is surgical. The possibilities for such treatment and the choice of surgical method depend on the size of the cyst, its location, and the pathological formation.

The present article reported a case of a 12-year-old male with the main complaint of pain on the right lower back tooth region. The radiographic examination revealed the presence of a well-defined radiolucency surrounded by a corticated border between mandibular central incisors. The case was managed by complete enucleation under local anesthesia without extraction of any teeth.

We chose enucleation (cystectomy) as a surgical procedure as the method of choice, because postoperative complications are the rarest, and the best healing is also provided. After one month of surgery treatment, complete wound healing was recorded at the clinical control at the Department for oral surgery.

Keywords: *Enucleation, periapical cyst, radicular cyst.*

Background

Jaw cysts are pathological formations that are made up of cystic lining and cystic contents. The cystic lining is characteristic, consisting of two layers: an inner one made of epithelial tissue and an outer one made of connective tissue. The epithelial layer may be of a different type of epithelium depending on the type of cyst. A number of classifications of cysts based on different criteria have been described in the literature. The World Health Organization classification basically divides all jaw cysts into two groups: developmental and inflammatory (1).

Developmental jaw cysts are lesions that occur with the proliferation of epithelium present in the bone tissue of the jaw, where that proliferation is without the effect of inflammation. The origin of the epithelium may be from odontogenic tissue or other anatomical structures. Inflammatory cysts are those cysts that develop from the odontogenic epithelium under the direct influence of inflammation and persistent irritation of a bacterial nature. Causes of jaw cysts are different, numerous and depend on the type of cyst. The basic precondition for the occurrence of a cystic lesion is the previous presence of epithelial tissue at the site of future development

of the cystic formation. The epithelium from which the cyst forms may be of embryonic, glandular, or oral origin, or an epithelium that secondarily grows deep into the tissue after injury or through a fistulous duct. In odontogenic jaw cysts, which account for 89% to 94% of all jaw cysts, the epithelium originates from embryonic epithelial debris, which are actually debris left over after the growth and resorption of the corresponding tissues (2).

Chronic pathologies, including cystic lesions, are quite common pathological formations. They are usually asymptomatic and therefore accidentally diagnosed. Radicular cysts are one of the most common and their prevalence is over 50% which makes up more than two thirds of all jaw cysts. They can occur at any age, they are the same in both sexes. It is especially characteristic that radicular cysts arise from the so-called epithelial Malassez – residues in the periodontal tissue, as a consequence of inflammation of the pulp (3).

Case Presentation

A 12-year-old male patient was referred to the Department of preventive and pediatric dentistry because of a pain, but without its precise localization.



Figure 1. Retroalveolar image of the low frontal teeth

On general examination, the patient was apparently healthy. Medical and family history were not significant. The patient was referred for X-ray examination. Retroalveolar imaging (Figure 1) and orthopantomographic imaging (Figure 2) were performed. The Orthopantomograph image revealed the presence of a unilocular radiolucent cystic lesion with sclerotic border associated with the mandibular right and left first central incisive roots. The mandibular right and left first central incisive teeth was nonvital.

The central incisors from the lower jaw were trepanated and extirpated (Figure 3) and the antibiotic Amoksiklav® film-coated tablets (amoxicillin 875 mg/125 mg clavulanic acid), two times a day was prescribed as an oral therapy within the next 5 days.

After the clinical and radiological examination (Figure 1 and 2), a provisional diagnosis of the radicular cyst was made. Parental consent was obtained prior to oral surgery. Once the infection had subsided, surgical intervention was carried out with a local anesthesia. Plexus anesthesia with Lidocaine HCl 2% and Epinephrine was administered prior to oral surgery. After the flap opening process, the cyst cavity was identified (Figure 4) and the contents of the cyst were removed (Figure 5). The channels of the lower incisors were filled with a definite channel filling (Endofill, Produits Dentaires SA, Lot: 9746 AL) a few hours before the surgery. Endofill is a radiopaque preparation for permanent root canal filling. Its composition is well

tolerated by tissues and it provides anti-inflammatory, antiseptic and germicidal actions.

Discussion

The most common cystic lesions affecting low jaw are radicular cysts. In our case report, the expansion of the cortical plates was not recorded, because the cyst was detected in time. Displacement and root resorption of adjacent teeth were also not evident in the present case report. One of the ideal choices of treatment of the chronic infected radicular cysts is the surgical enucleation. The size and prevalence of the cyst are definitely key factors in determining which treatment to choose. Several cases about children affection have been reported in the literature, some of which involve deciduous teeth (4, 5, 6) and some permanent teeth (7). Tkaczuk et al from their 15-year-experience with the jaw cysts consider jaw cysts occurring in children to be rarely symptomatic (8). Barrett et al suggested that sometimes ameloblastomas were misdiagnosed as dentigerous cysts (9). Saccucci M. et al in their study report have described conservative treatment for 9-year-old child affected by radicular cyst (6). Chouchene F et al in their case study have described non-surgical treatment of dentigerous cyst by extraction of the primary infected tooth and decompression. They have concluded that extraction is the treatment of choice for infected dentigerous cyst in mixed dentition (10). A surgical method called Partsch 1 (Marsupialization) was proposed by Carl Partsch in 1910 and was used to remove large mandibular cysts. This method lies in making an opening in the outer wall of the cyst, which drains the cystic contents into the oral cavity. In this way the pressure in the cyst is reduced. Marsupialization, i.e. cystotomy is a procedure of partial removal of the cystic sac, where only the superficial part of the sac is removed together with a thin layer of bone, while the rest remains.

Enucleation (cystectomy) - Partsch 2, the procedure of complete removal of the cyst was named later after the same author as Partsch 2 or enucleation or cystectomy. The enucleation method is used to treat small cysts, but it is advisable to use it in all possible cases as it is considered to have far greater advantages



Figure 2. Showing OPG showing dimensions of the cystic lesion



Figure 3. The central incisors from the lower jaw were trepanated and extirpated



Figure 4. Intraoperative picture showing complete enucleation of the cystic lesion



Figure 5. Showing specimen of the excised lesion

than marsupialization. Enucleation removes the entire cyst along with its cystic sac, making the chance of recurrence lower, according to Pindborg 33% and Toller 44% (11). In order to improve the method of marsupialization and reduce its shortcomings, Hermann proposed a modification of this method called the two-phase method. The first stage of this method consists of the standard Partsch 1 method, while in the second stage the residue from the cystic sac is removed and the wound is closed with primary closure. Complete removal of the cystic sac can be performed in two ways, using a closed or open technique of performing oral surgery. The closed method can be performed in two ways, in which the tooth is preserved with its apicotomy and intraoperative canal filling, or in the second way when the tooth is extracted. Thus, when planning a closed technique, the incision should be at least 0.5 cm wider than the future bone defect, while in the open technique the incision is performed along the edge of the future bone defect. In closed enucleation, a trapezoidal incision is made, the bone tissue covering the sac is removed, and then the sac itself is removed completely. In radicular cysts, after treatment of the wound, resection of the tooth root is performed as well as canal obstruction. Then, the surgical incision is returned to its original position and individual sutures are placed. This procedure should be the method of choice, as postoperative complications are the rarest, and the best healing is also provided. The open technique is applied in cases when there is a large cystic lesion in which due to the size of the defect, the possibility of not stabilizing the coagulum is not excluded, so there is a possibility of infection and compromising the operative and postoperative course.

Application of allogeneic materials in the treatment of radicular cysts

A different approach to the treatment of large cystic lesions is made by using autogenous, allogeneic or xenogenic grafts, and now using alloplastic or synthetic materials. The most commonly used autogenous graft is pelvic (crista iliaca), rib, or lower leg (tibia). The risk of using this type of graft is the rejection of the graft due to instability, low blood supply, increased possibility of infection and graft resorption.

Conclusion

The case is important to medicine, because the radicular cysts of the lower jaw, like other chronic bone lesions, often lead to the loss of a significant portion of the bone, putting the mandible at risk of fracture if they are asymptomatic and are not diagnosed in time. In the case presented it was necessary to undertake invasive surgery due to the size of the periapical cyst as well as to prevent the development of jaw bone complications.

Ethical standards (See [Statement of Human and Animal Rights](#)).

Informed Consent

Written informed consent was obtained from the parents of the 12-year old child who participated in this case report.

Conflict of Interest

The authors declare that no conflicts exist.

Financial Disclosure

The authors declared no financial support.

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Received: 15.10.2021

Revised: 08.11.2021

Accepted: 11.11.2021