CASE REPORTS

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Decompression procedure as a successful initial approach to a large maxillary dentigerous cyst in a 12-year-old boy – a case report

Postupak dekompresije kao uspešan inicijalni pristup u lečenju velike maksilarne folikularne ciste kod 12-godišnjeg dečaka

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Abstract

Introduction. A dentigerous cyst is a pathological lesion associated with the crown of the unerupted or impacted tooth. Decompression is proposed as the initial treatment for large cysts, especially in younger patients. The aim of this study was to present clinical, radiological, histopathological, and therapeutical aspects of the large dentigerous cyst in the maxilla. **Case report.** A 12-year-old boy with a large dentigerous cyst in the maxilla was referred to our clinic. A dentigerous cyst was associated with the crown of the unerupted maxillary left canine. Management of the cyst included initial decompression with biopsy, followed by secondary enucleation after 9 months and orthodontic treatment. Histopathological examination confirmed the definitive diagnosis of the dentigerous cyst. **Conclusion.** Initial decompression with a subsequent enucleation proved to be an effective treatment of choice for the large dentigerous cyst.

Key words:
child; decompression, surgical; dentigerous cyst; diagnosis; maxilla; oral surgical procedures.

Apstrakt

Uvod. Folikularna cista je patološka lezija, povezana sa krunicom neizniklih ili impaktiranih zuba. Dekompresija je predložena kao inicijalni tretman u terapiji velikih cista, posebno kod mlađih pacijenata. Cilj rada bio je da se predstave klinički, radiološki, patohistološki i terapijski aspekti velike folikularne ciste u maksili. **Prikaz bolesnika.** Dvanaestogodišnji dečak sa velikom folikularnom cistom u gornjoj vilici upućen je u našu kliniku. Folikularna cista se nalazila oko krunice neizniklog levog maksilarnog očnjaka. Terapija ciste obuhvatila je inicijalnu dekompresiju sa biopsijom, praćenu sekundarnom enukleacijom nakon 9 meseci, i ortodontski tretman. Histopatološka analiza potvrdila je konačnu dijagnozu folikularne ciste. **Zaključak.** Inicijalna dekompresija sa naknadnom enukleacijom pokazala se kao efikasna terapijska opcija u lečenju velike folikularne ciste.

Ključne reči:
deca; dekompresija, hirurška; cista, odontogena; dijagnoza; maksila; hirurgija, oralna, procedure.

Introduction

Dentigerous cysts are the second most prevalent odontogenic cysts (14–24% of all oral cysts), mainly located in the posterior parts of the mandible [1]. They often appear in the second and third decades of life, more commonly in males. In general, dentigerous cysts are asymptomatic in the early stages, but with the cyst progression, swelling, tooth mobility, and displacement might be clinically noticed [2]. Diagnosis of the dentigerous cysts is usually made by radiographic examination and is confirmed by histopathological verification. Radiographically, they are presented as well-defined, unilocular lesions associated with the crown of the unerupted or impacted permanent teeth, most commonly mandibular third molars, maxillary canines, and maxillary third molars [3]. Histologically dentigerous cysts have connective tissue capsules permeated by young fibroblasts and sometimes odontogenic epithelial remnants, 2–3 layers thick epithelium with Rushton's bodies, filled with cystic fluid [4].

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Various treatment techniques have been described for managing cystic lesions, including decompression, marsupialization, enucleation, bone resection, and their combination [5]. Established criteria for the election of the most suitable therapeutic approach are cystic lesion dimensions and localization, histological presentation, patient age, the position of the affected tooth, and its relation with the adjacent anatomical structures [6].

Decompression represents a specific conservative method, first described in 1958, that consists of making a small opening in the lesion and inserting different devices such as polyethylene tubes or stents [7]. The aim of this procedure is to reduce intracystic pressure by constant drainage and induce new bone formation, which consequently leads to a substantial decrease in cyst size [8]. The preservation of important anatomical structures, such as the inferior alveolar nerve and maxillary sinus, may be considered the main benefit of decompression [9]. With great success, it is used in treating large cystic lesions in younger patients due to the high regenerative potential of their oral tissues.

The aim of this article was to present clinical, radiological, histopathological, and therapeutical aspects of the dentigerous cyst in the maxilla of a 12-year-old patient.

Case report

A 12-year-old male patient was referred to the Department of Dentistry of the Faculty of Medical Sciences in Kragujevac. He was in good general health, with no history of major medical conditions or syndromes. Written informed consent was obtained from the boy's parents for all procedures, imaging, and publication data.

The patient reported no pain or sensitivity during the first appointment. Intraoral examination indicated a healthy-looking mucosa with a slight, painless swelling in the area of the unerupted maxillary left canine on the buccal side. On palpation, fluctuation was present.

Orthopantomogram (OPG) revealed a large cyst located around the crown of the maxillary left canine, with well-defined borders (Figure 1). A complementary radiographic method, computed cone-beam tomography (CBCT), was used to assess the dimensions of the cyst more precisely and its relationship with surrounding structures (Figure 2). The rate of cyst reduction was monitored on panoramic radiographs taken after three, six, and nine months. When the size of the cyst was reduced enough to avoid adjacent structures,

Fig. 1 – Panoramic radiography before therapy: a large cyst located around the crown of the maxillary left canine with well-defined borders.

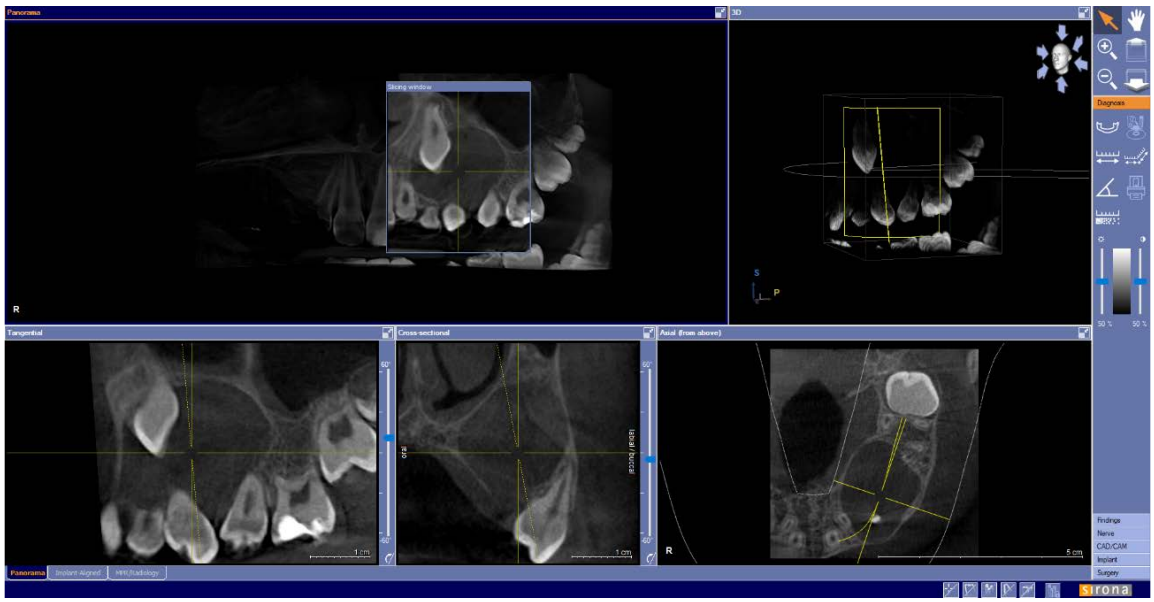

Fig. 2 – Computed cone-beam tomography (CBCT) shows well-demarcated cystic lesions.

surgical enucleation of the cyst was performed using the last panoramic that was taken.

The treatment plan was made according to the characteristics of the lesion and included initial decompression followed by secondary enucleation after 9 months. In order to facilitate the eruption of the involved teeth, orthodontic treatment was advised.

Decompression and biopsy of the cystic lesion were conducted with local anesthesia (4% articaine with 1 : 100,000 adrenaline; Septanest®, Septodont, France). The mucoperiosteal flap was elevated, after which one part of the cyst was excised and sent for histopathological verification. A tube was inserted in the cystic cavity to ensure proper drainage and regular saline irrigation in the following period. No signs of infection were recorded during control appointments in the next 9 months.

Histological examination revealed fibrous connective tissue lined with stratified, nonkeratinized squamous epithelium, which verified the diagnosis of the dentigerous cyst. Therefore, histopathological analysis represents an essential asset for establishing an accurate diagnosis.

The surgical intervention was performed under local anesthesia. OPG revealed a significant decrease in the cyst volume and thickening of its walls (Figure 3). After the decompression procedure, CBCT was not performed due to radiation dose reduction. A mucoperiosteal flap was elevated, and minimal bone resection was performed. After that, cyst remnants were eliminated, along with the profuse saline irrigation, to prevent lesion recurrence. The mucoperiosteal flap was relaxed, and sutures were performed.

After the intervention, the patient was prescribed prophylactic antibiotic therapy (amoxicillin 250 mg every 8 hrs), which was continued for five days postoperatively, and analgetic (ibuprofen 200 mg every 8 hrs) for two days. He was also instructed to maintain proper oral hygiene. Sutures were removed on the 7th postoperative day. The surgical site showed no signs of infection and healed without complications.

Discussion

Dentigerous cysts form due to fluid collection between the reduced enamel epithelium and the crown of the unerupted or impacted tooth [10]. They can be categorized into two main groups: developmental, predominantly affecting molars, and inflammatory, mostly involving mandibular premolars [2]. Dentigerous cysts are a very common finding in mixed dentition.

Treatment of large odontogenic cystic lesions remains without standardized protocol. Several different procedures are available for cyst management, such as decompression, marsupialization, enucleation, and novel techniques like laser incisions and fenestration [11]. The ultimate goal is to remove the lesion completely and to avoid complications during and after the procedure. Decompression represents a conservative approach to treating cysts. Compared to other methods, it is significantly less technically demanding, less invasive, and has a lower incidence of postoperative complications [6, 12]. It results in the shrinkage of the cyst volume, the preservation of the surrounding tissues, and the decreased rate of pathological fractures [9].

We used decompression as an initial method to treat a large maxillary dentigerous cyst, which proved effective, as the cyst volume decreased by approximately 70% after 9 months (Raša Mladenović, created a CorelDraw VBA Macro for the analysis of the cyst area, based on the difference between the first and last OPG). A remarkable percentage of the cyst shrinkage is due to the age of the patient and his high regenerative potential. Therefore, decompression may be a treatment of choice for the younger population. In a study that included 17 patients with cystic lesions of the jaw, the average reduction rate after decompression was 64%, with a mean decompression period of 8.1 months [13]. Oliveros-Lopez et al. [14] have shown that decompression as an initial treatment of odontogenic cysts is highly effective as it significantly reduces the size of the lesion without damaging surrounding structures. Riachi et al. [15] reported a remarkable increase in the bone formation and shrinkage of the dentigerous cyst of 48.5% in the 3 months following the decompression procedure. There are different opinions about the duration of the decompression, but various authors agree that a period from 6 to 14 months might be the most suitable period, which is in accordance with our report.

Fig. 3 – Radiographic evaluation: panoramic view after decompression procedure.

Diagnosis of dentigerous cysts includes clinical evaluation and radiographic imaging – OPG. However, in the cases of large lesions, a complementary radiographic method such as CBCT is necessary. It allows the three-dimensional assessment of the present pathological lesion and its relationship with adjacent anatomical structures. Moreover, CBCT enables precise measuring of the volumetric changes following decompression procedure [8]. These were the reasons why we chose this particular imaging method for our patient.

The main disadvantages of decompression are an extended time of healing, possible recurrence of the lesion, and patient cooperation. For this procedure to be successful, it is fundamental that patients are motivated enough to come for checkups regularly during the follow-up period and maintain good oral hygiene. Our patient accepted all of the instructions and showed good compliance.

The subsequent surgical procedure of the cyst was performed without complications. Our case indicates that a decompression period of 9 months is sufficient for safe and successful enucleation.

Conclusion

The decompression procedure may be regarded as a valuable therapeutic approach for managing large dentigerous cysts located in the vicinity of vital anatomical structures, especially in the younger population.

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