

Surgical Protocol and Treatment of Extent Radicular Cyst -A Literature Review and A Case Report

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1. Abstract

A case of an adult patient is presented. A detailed history and a panoramic radiograph were taken, and a fine-needle aspiration biopsy was performed. A strict clinical protocol was followed. The patient was observed postoperatively.

1.2. A Literature Review

Radicular cyst is the most common (54.7%) odontogenic cyst, most often resulting from inflammatory changes, endodontic treatment errors, or inflammatory changes in the tooth-retaining apparatus. A systematic review of the literature showed that of 18,298 odontogenic cysts reported, 9,983 (54.7%) were radicular [1,2,3,4,5,6]. Once formed, sometimes, a cyst may resolve on its own, but in most cases, it keeps growing and needs surgical intervention depending on its type and location [7].

2. Case Report

The patient M. K., 75 years old, from Kazanlak, visited the Dental Center "O.SEM" in Stara Zagora with the following complaints: swelling, mild pain around the upper jaw and the right cheek. The inflammation has an unspecified duration. She also reports a tendency to feel nauseous. She denies any other general illnesses or medication intake.

2.2. General Condition

The patient appears consistent with her stated age. In good general condition. RR 110/70, pulse 80/min.

2.3. Status Localis Extraoralis

Facial asymmetry is present on the right side. Skin hyperemia is observed. Palpation reveals a formation in the area of the upper jaw-slightly painful, relatively mobile, located in the buccal region. When the cyst grows in volume, the outer cortex is thinned out, due to the loss of bone mineral content and may show "Ping Pong/Table Tennis Ball" springy consistency [7].

2.4. Radiographic Findings

Evidence of a cystic formation connected to the maxillary bone from tooth 13, with distal bone lysis involving the tuberosity of the maxilla (Figure 1): Impacted tooth 18 is identified. Tooth 17 has undergone endodontic treatment and, along with a bony island, is surrounded by the faint shadow of the formation. A root of tooth 14 is also found, endodontically treated at the medial border. Tooth 13, also endodontically treated, forms the anterior border of the lesion. The formation is surrounded by an osteonecrotic wall, suggesting it is likely an odontogenic maxillary cyst.

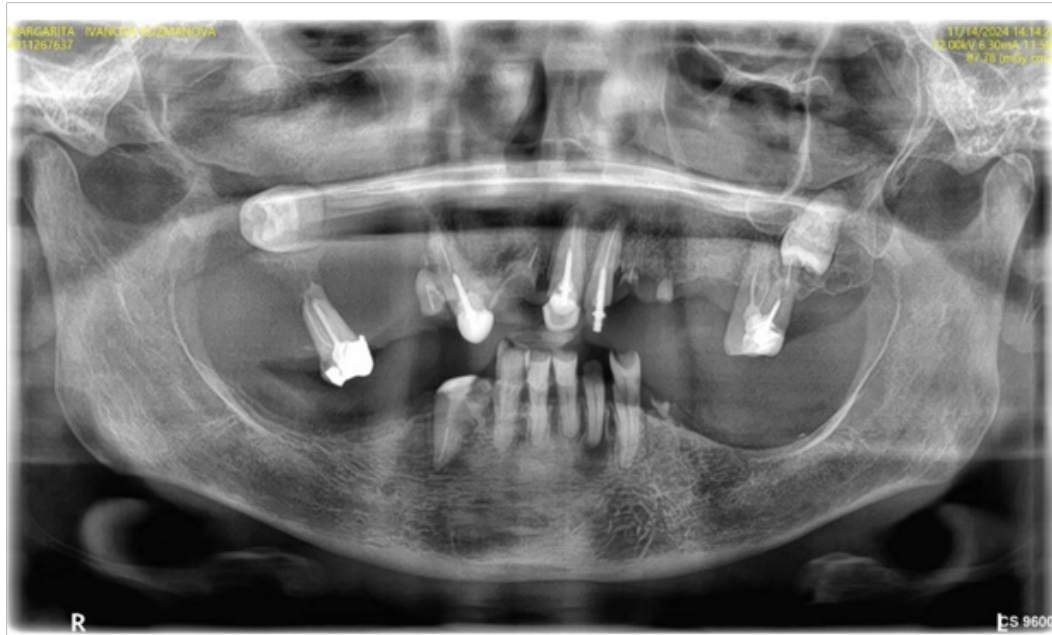


Figure 1: Preoperative panoramic showing a cystic formation connected to the maxillary bone from tooth 13 and radiolucent lesion.

2.5. Status Localis Intraoralis

Slightly limited mouth opening. The transitional fold on the right side from tooth 13 to the tuberosity, including the area, is smoothed. Signs of fluctuation are present, with severe swelling of the buccal mucosa and collateral infraorbital edema. Upon diagnostic incision, 20 ml of clear amber fluid with cholesterol crystals was aspirated, confirming the preliminary diagnosis (Figure 2): The patient was advised to be hospitalized within three weeks, but she refused immediate admission, citing the need to care for a child with cerebral palsy. She was, however, registered for outpatient treatment [7-9].

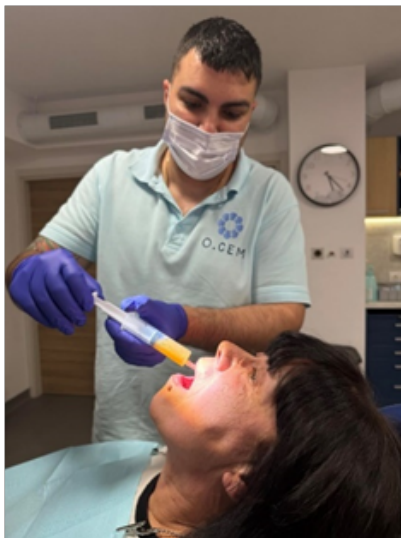


Figure 2: Aspiration. The orofacial cyst contains fluid in its cystic cavity, which varies in consistency, color, and protein content, and helps in differentiating and arriving at a provisional diagnosis based on these observations.

2.6. Treatment and Surgery

The patient was admitted to the department and was on Augmentin 1000 mg every 12 hours from the previous morning. The area was cleaned extra- and intraorally and prepared for surgical treatment [Fig.3]. For anesthesia, six carpules of Septanest 1:200,000 were prepared according to the individual dosage formula:

$$7 \text{ mg/kg} \times 65 \text{ kg} = 455 = 11.375 \text{ ml}$$

$$4\% \times 10 \text{ 40}$$

The anesthetic could be administered in six carpules: $6 \times 1.7 \text{ ml} = 10.2 \text{ ml}$. The anesthetic (10.2 ml) was supplemented in a 20 ml syringe to 15 ml with saline. The patient received: Tuberal conduction anesthesia with 4 ml infraorbital conduction anesthesia. Infraorbital conduction anesthesia with 4 ml palatine nerve block using approximately 1 ml. Incisive nerve conduction anesthesia with 3 ml applied terminally sublingually for hydrodissection. A vertical incision was made from tooth 11, continuing along the imaginary ridge of the alveolar crest palatally to the imaginary tuberosity. Before and after anesthesia, another 15 ml of cystic fluid was aspirated. The incision extended to the attached and unattached gingiva down to the subgingival level, leaving the cystic sac intact. The root of tooth 12 was extracted. Dissection of the cystic sac began buccally, preserving the buccal epithelium. The cyst had lysed the entire maxillary sinus cavity up to the orbital floor, 1 sm below the infraorbital rim, a large portion of the zygomatic bone, the palatine process of the maxilla, the maxillary tuberosity, the alveolar process, and the horizontal plate of the palatine bone (Figure 4,5): Tooth 18 was impacted in the palatine bone. Within the cystic mass and sac, tooth 18, tooth 17 with part of the attached gingiva, and the root of tooth 14 were left, as it was impossible to preserve them along with the underlying bone sequestrum and mucoperiosteum of the maxillary sinus. A cavity

was formed up to the orbital floor, 1 mm below the infraorbital rim, extending to tooth 13, which was unaffected by the cyst [10-13]. The size of cyst formation is presented on Figure 6.



Figure 3: Cysts lined by an epithelium are more common in both jaw-bones than any other regions of the body.

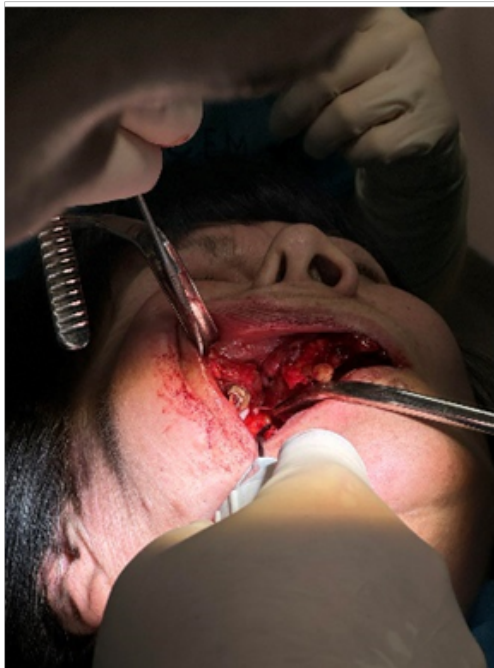


Figure 4: After complete enucleation procedure is over, the entire cavity is inspected for proximity of the adjoining vital structures and for the remnants of the pathological tissues.



Figure 5:Decompression of a cystic lesion by creating a small opening and keeping it patent by inserting a drain.

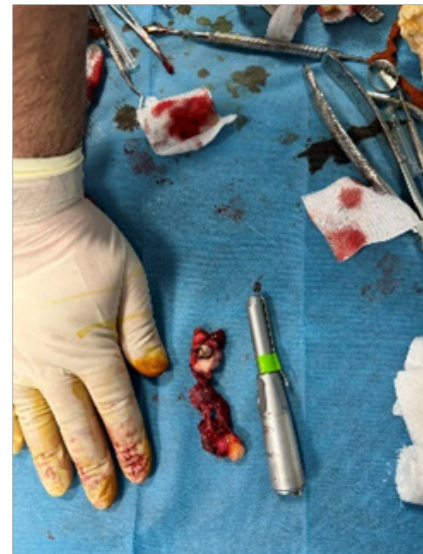


Figure 6: Cyst formation.

2.7. Intraoperative Hemorrhage and Postoperative Care

During cyst removal, profuse bleeding began from the distal cavity area. Several compressive dressings soaked in hemostatic solution were applied to stop the bleeding. The area was irrigated with saline and Bradcol. The flap was adapted and sutured in a “blind” manner, achieving hermetic closure and hemostasis. The patient received intramuscular methylprednisolone (2 ampoules)-one on the day of surgery and another the next day. Vitamin C, Dicynone, and calcium gluconate were also administered for hemostasis. Postoperative Instructions and Follow-Up: Detailed instructions and recommendations were provided for the postoperative period. During a control examination after one day, part of the drain was removed. On the fifth postoperative day, the gauze drain was entirely removed. Two weeks later, sutures were removed, and a follow-up examination was scheduled for one month [14,15,16].

2.8. Histological Diagnosis

The results confirmed a follicular odontogenic cyst.

3. Conclusion

Cysts of the maxillofacial bones are one of the most common pathologies. A differential diagnosis with tumors is necessary, because quite often the clinical picture mimics them. Radiography is not sufficient for diagnosis. A detailed history together with aspiration biopsy will help with the differential diagnosis. Success depends on detailed planning, adherence to a strict clinical protocol, histology and long-term follow-up.

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