

# DIAGNOSIS AND TREATMENT OF MANDIBULAR CYST - CASE REPORT

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### ABSTRACT

**Introduction:** Jaw cysts are common in dental practice, but inadequate diagnostic approach can aggravate their treatment. The role of radiological methods is extremely important in diagnosing a cystic lesion and the choice of therapeutic approach because of the fact that odontogenic cysts are most frequently asymptomatic. They are often discovered during routine x-ray imaging.

**The aim of the paper:** The aim of the paper is to point out the importance of a detailed diagnostic approach on the case from our own casuistry, and also to underline therapeutic treatment of a pathological cystic lesion.

**Materials and methods:** In this paper we presented a case of a female patient to whom we detected, upon an accidental routine x-ray examination, a pathological change in the form of a cystic lesion in the mandible in the lower first molar region. Within the surgical protocol a surgical extraction of residual root of tooth 36 was performed, as well as mesial root resection of tooth 37 and a complete enucleation of the cystic formation. The wound was primarily sutured.

**Result:** After the surgical procedure, the patient had minimal postoperative problems such as swelling and occasional pain. Postoperative period was monitored through regular clinical and x-ray control check-ups. The wound has completely healed.

**Conclusion:** Aside from impeccable knowledge in anatomy, oral surgeons must be informed about all the possibilities that modern diagnostics provides in order to be able to successfully diagnose a pathological process, considering the fact that every mistake can be reflected on the therapeutic – operative outcome.

**Key words:** odontogenic cyst, radiological diagnostics, mandible.

## Introduction

Cysts in the orofacial region represent a pathology which oral surgeons often encounter in their every-day clinical practice. Diagnosis of cystic lesions is a challenge for every surgeon because it is necessary to use detailed tests to differentiate between a benign growth and potential malignancy which are clinically and radiologically difficult to distinguish [1]. Cysts in the orofacial region have their own specific characteristics. A cyst is a term for a pathological cavity, consisting of two membranes – inner epithelial and outer connective one [2]. With its growth the cyst creates a cavity which can be filled with liquid, pulpous or gaseous content. The growth of a cyst always occurs in the direction of the least bone resistance [1]. Cysts whose formation is associated with a tooth are called cysts of odontogenic origin. Odontogenic cysts are the most common lesions in the group of jaw cysts and, according to some researches, of all jaw cysts their frequency is 89 - 94% [5].

With their growth, cystic lesions can cause increased bone osteoclastic activity, and the consequence of this is weakening and reduction of bone functionality. The relation of the cyst and adjacent anatomical structures is of great importance, with special emphasis to the relation to adjacent teeth, maxillary sinus and mandibular canal [5]. Modern diagnostic methods imply detailed anamnesis, clinical examination of all oral structures, radiological examinations, analysis of the cystic content punctuate, and for final confirmation, pathohistological analysis of tissue sample [3]. The aggravating factor of making an early diagnosis is the fact that cysts do not cause the onset of symptoms until they deform the surrounding anatomical structures with their growth or until inflammation occurs. In that case there are some significant clinical signs such as tooth discoloration, dental arch asymmetry, occurrence of persistent painless swelling [2]. From all of the above-mentioned the existence of cystic lesion is often diagnosed by random radiological examination.

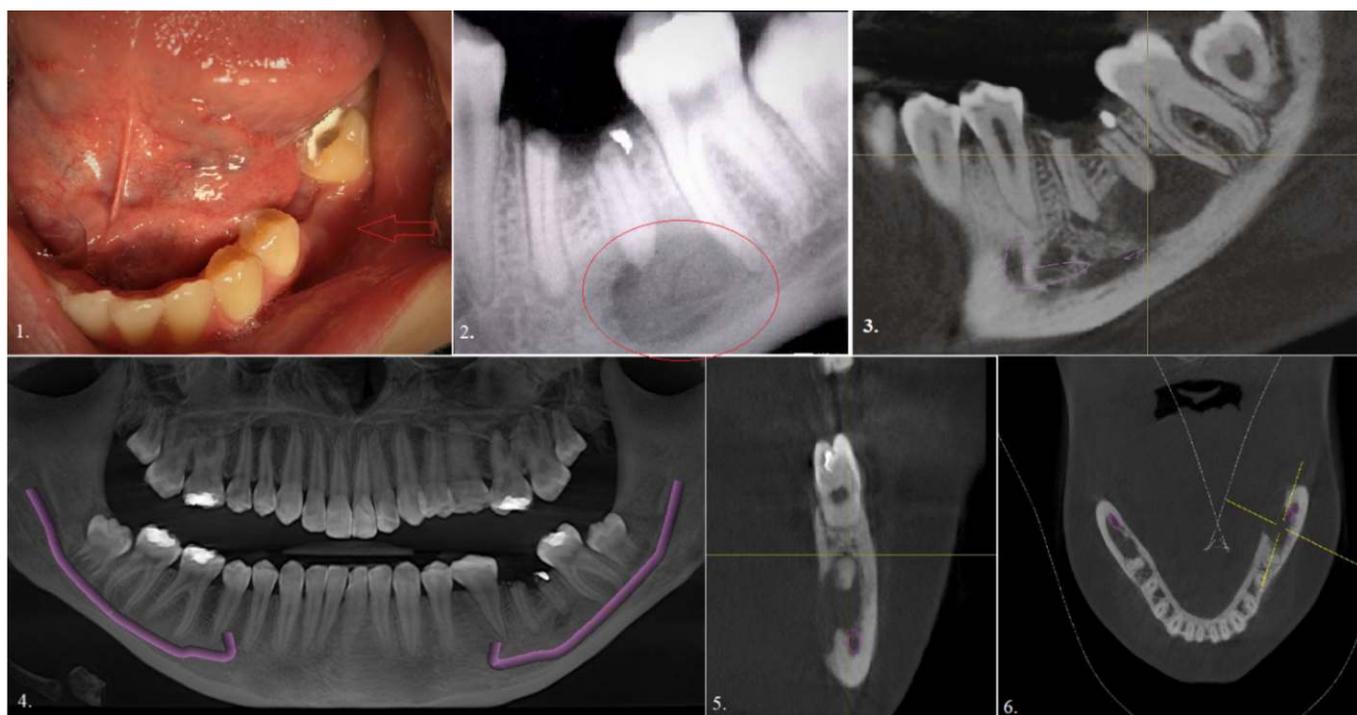
Radiology methods that we use in diagnosing cystic lesions are: retro-alveolar imaging, orthopantomogram, computed tomography (CT) and three-dimensional tomography (CBCT) [3,5]. Odontogenic cysts manifest radiologically as well-limited unilocular or multilocular illumination. In the case of an inflamed lesion, it can be seen in the x-ray that cyst edges, otherwise clearly defined, become less clear [6]. A three-dimensional computed tomography (CBCT) is a modern diagnostic method providing a detailed insight into the size and position of a cystic lesion as well as its relation to the surrounding anatomical structures.

Treatment of odontogenic cysts is surgical, and the choice of a method depends on the size, localization and the type of cyst, as well as the general state and age of a patient. Formulating a correct diagnosis is important as a part of preoperative patient preparation and the choice of adequate surgical technique [2,3].

The aim of the authors of this paper is to point out the importance of detailed diagnostic approach with the emphasis to x-ray diagnostics in the detection of pathological cystic lesions, as well as the presentation of surgical protocol in its treatment.

## Case report

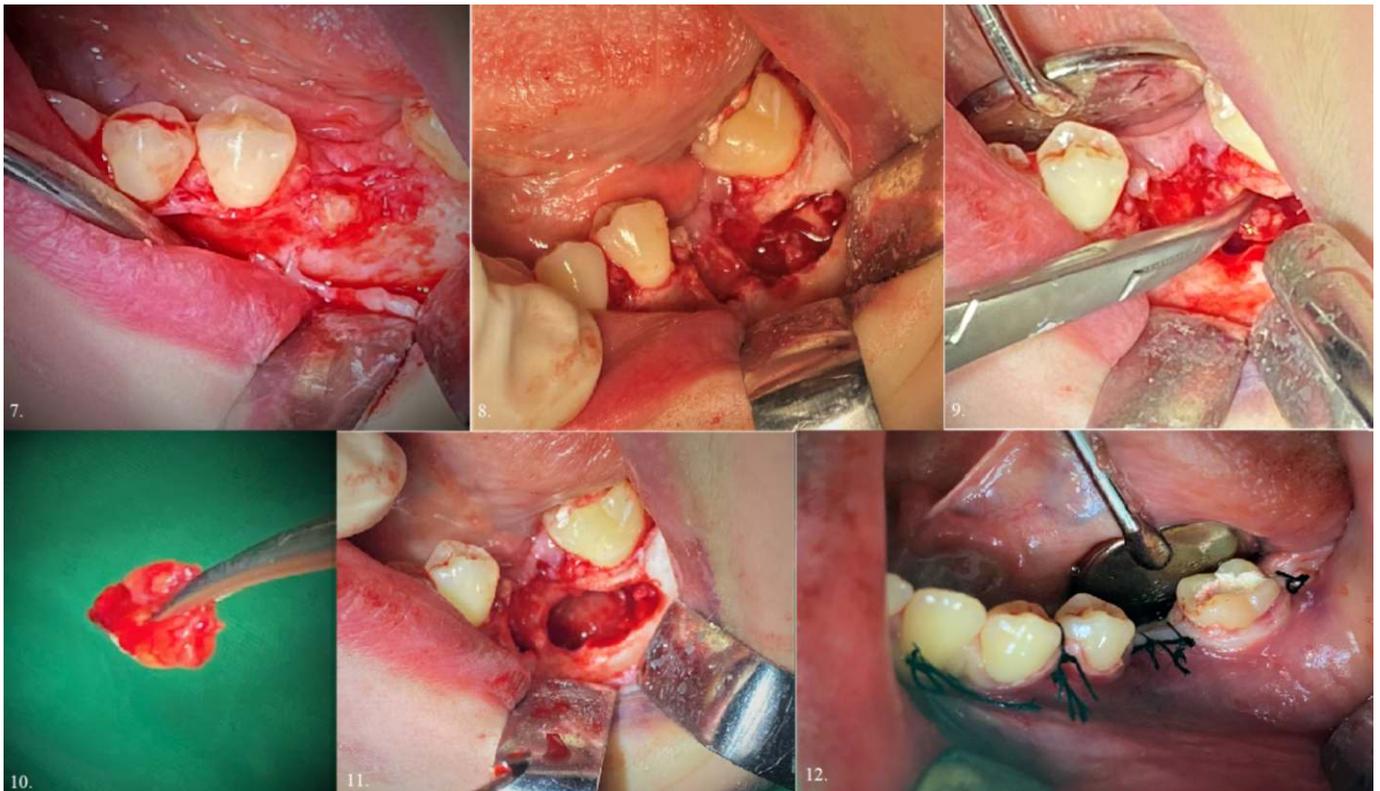
In this paper we presented a case of a 14-year-old female child that was admitted to the Clinic for oral surgery at the Faculty of Dentistry in Sarajevo after an attempt of extracting the lower left first molar when the fracture of the crown of the tooth 36 occurred. According to the patient x-ray diagnostics was not performed before the intervention started. After detailed anamnestic processing, a clinical intraoral examination began revealing the missing of the crown of tooth 36. The mucosa in the mentioned region is of normal color, and pathologically unaltered (Figure 1). Palpation in the area of fornix vestibule in the region of tooth 36 shows a hard, spherical thickening of bone wall



**Figure 1.** Preoperative clinical view; **Figure 2.** Preoperative radiographic view - radiolucency in the area of the distobuccal root 36; **Figure 3.** Sagittal CBCT image; **Figure 4.** Panoramic CBCT image; **Figure 5.** Coronal CBCT image; **Figure 6.** Axial CBCT image;

covered in unaltered mucosa. During the diagnostic processing as initial radiological method, we used X-ray image recording x-ray darkening being correspondent with remaining roots of tooth 36, as well as a radiolucent spherical lesion with the diameter of 1 x 1.5 cm clearly confined from the surrounding bone. The image clearly displays that the mesial root of tooth 37 is in contact with the cystic lesion (Figure 2). Additionally, radiological analysis shows a close relation of the pathological change with the mandibular canal so CBCT scan is performed in order to get a better orientation and planning of the surgical procedure (Figure 3-6). Based on all of the above-mentioned, a working diagnosis *Cystis mandibule in regio dentis 36 et radix relicta 36* is made, as well as an indication for surgical procedure where extraction of remaining roots of tooth 36 is planned, a resection of mesial root of tooth 37, as well as a cystectomy in the specified region. The surgical procedure was performed under local anesthesia. After administering conduction anesthesia (Septanest Forte, 40mg/ml +0,01 mg/ml, 1,7 ml,

Septodont France) an incision cut is made. A mucoperiosteal flap of full thickness is elevated, and then buccal cortical lamella, which was extremely thin, is removed, and cystic envelope is revealed as well as residual roots of tooth 36 which are extracted (Figure 7,8). The cyst is removed from the surrounding bone by suitable curettes and is completely enucleated (Figure 9-11). A residual root apicoectomy is performed on tooth 37 which was preoperatively completely filled with gutta-percha points and a glass ionomer cement sealer. The bone defect is washed thoroughly with sterile saline solution (0.9 % sodium chloride). Inspection detects intact mandibular canal. The lobe is repositioned, and the wound is primarily sutured with individual sutures (Figure 12). Antibiotics are prescribed (Augmentin tablets 875mg + 125mg, GlaxoSmithKline, Ireland) every twelve hours for seven days, and the patient is given detailed instructions for the postoperative period. The surgical procedure went properly with minimal postoperative discomforts in terms of postoperative edema and pain. At the control

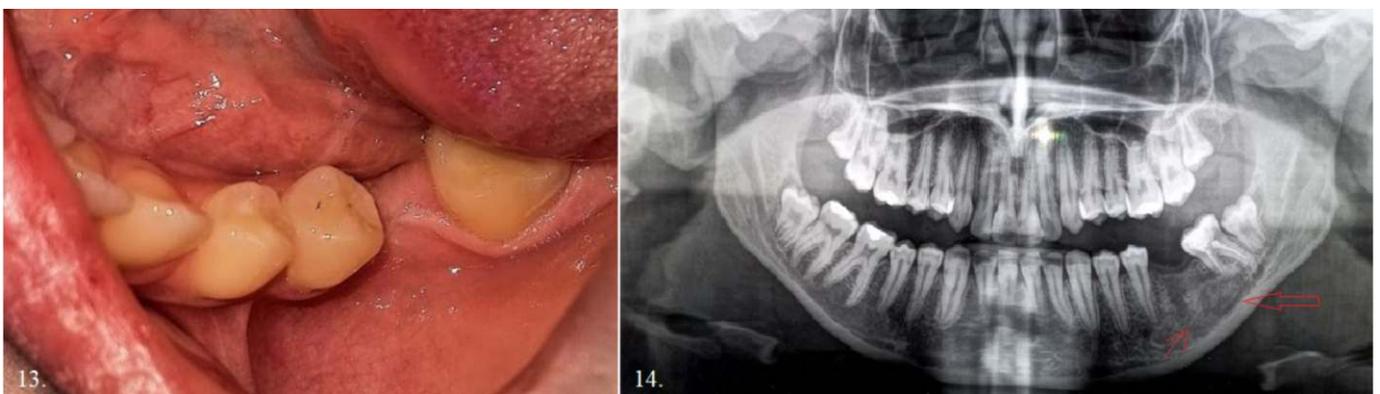


**Figure 7.** Incision; Elevated mucoperiosteal flap; **Figure 8.** The surgical wound after extraction of residual roots; **Figure 9.** Completely enucleated cystic lesion; **Figure 10.** Macroscopic view of cystic lesion; **Figure 11.** Intraoperative view of the bone cavity after cyst enucleation; **Figure 12.** Repositioned and primarily sutured flap

examination the patient denied a numbing sensation on the left side of the mandible. The stitches were removed on the seventh day after operative procedure (Figure 13).

The postoperative course was monitored through regular control examinations in specified time intervals after two days, seven days, one month, and six months. At the last control clinical

examination (6 months after the operative procedure) the orthopantomography image



**Figure 13.** Successful wound healing can be noticed six months postoperatively; **Figure 14.** Panoramic X –ray image six months after surgery

dontal pocket [2,3]. They cause bone destruction with their growth, and sometimes even displacement of the teeth they are in contact with. Diagnosis is not possible by clinical examination until the cyst reaches large dimensions and outgrows the width of alveolar ridge and deforms the bone. Bone resorption is mostly expressed in the direction of least bone resistance and this distinguishes the tumor formation from the cystic one since tumor formation grows in all directions. Cystic lesions are most often discovered by accidental radiological examination. Making the correct diagnosis is of great importance in order to distinguish possible malignant changes of the jaw which require a more radical treatment [3,11].

Early detection of cystic lesions in jaw bones is of great importance. Odontogenic cysts and bone lesions do not occur very often in everyday clinical practice. Cysts possess the quality to grow slowly and it can take several years until they are discovered [3]. For that reason, making a timely diagnosis is an even bigger challenge. Odontogenic cysts can also grow faster if there is an inflammation of their contents, the so-called cystic sac [1,3].

It is very important to know clinical, especially radiological, properties by which cystic lesions are distinguished. Clinical and radiological findings often lead to differential diagnosis but the final diagnosis can only be confirmed by histopathological finding [7].

The diagnosis of cystic lesions begins with detailed anamnestic processing, a clinical examination of a patient – inspection and palpation of the suspect part of the jaw, and tooth percussion. In certain situations, it is necessary to conduct additional diagnostic methods such as puncture and clinical examination of the cystic content, as well as cytological examinations of the punctuate and cells, and also 3D computerized tomography of the jaw bones [3]. Ortho-pantomograph, computerized tomography and 3D computerized tomography are necessary for detailed analysis of radiolucent lesions in jaw bones. Computerized tomography (CT) and Cone beam computerized tomography (CBCT) have an immeasurable significance in estimating the edges of the lesions and their relation to other anatomical structures, such as the lower alveolar nerve. Regardless to the fact that

most jaw lesions, which have well-defined sclerotic edges, are benign in nature, detailed radiological diagnostics plays very important role in establishing a diagnosis which is not clinically expected [8,9].

The aim is to select an optimal method which provides a maximal representation of details and all necessary diagnostic data [1]. Aside from diagnostic value, while choosing an imaging method, possible harmful effects of imaging on patient's health are also taken into consideration [9,10]. Cyst findings with clear clinical signs along with two-dimensional radiological image fulfill diagnostic criteria providing the surgeon enough information before the treatment of the cystic lesions. However, in the event of less clear cases, it is necessary to conduct three-dimensional imaging after the two-dimensional ones. In those cases, it is possible to select the methods of computerized tomography that entail two options: dental CT and CBCT. In dentistry, the advantage is given to CBCT because it provides a quality image with less radiation [3,7].

The knowledge of characteristic signs of radiolucent lesions of the jaw bones in x-ray images narrows the differential diagnostics and it is crucial for identification of those lesions [8]. Lesions in the jaw bones can be radiolucent, radiopaque or mixed [12]. The largest number of lesions (>80%) is radiolucent. Unilocular radiolucent lesions with well-defined edge most commonly indicate the presence of a benign slowly proliferating process, or a process of inflammatory etiology, while multilocular lesions with well-defined edges indicate a benign, but aggressive process. A combination of a radiolucent and radiopaque lesion can be the result of inflammatory, metabolic states, fibro-skeletal lesions or malignant processes. Lesions with less defined edges represent an aggressive, inflammatory or neoplastic process [10,12].

Radiological diagnostics of cystic lesions is an essential step preceding surgical treatment of a cyst. Surgical method that the surgeon opts for depends on the size of a pathological process and detailed evaluation of anatomical structures the cystic lesion may be in contact with [1,3]. Cysts of smaller dimensions are removed by enucleation and primary wound closure by Partsch II

procedure. For the operation of larger cysts in the lower jaw there are descriptions of techniques of marsupialization or Partsch I method, as well as methods of permanent postoperative suction [13,14]. Technique of decompression, which firstly decreases the cyst volume and then after several months, depending on the shrinking intensity, enucleation is performed, can be applied for large cysts in the upper and lower jaw [14].

The presence of pathological cystic lesion can endanger the patient's health and normal function of the stomatognathic system, as well as development of further complications. Therefore, we want to emphasize that it is important to adhere to all available diagnostic methods in order to detect the pathological process in timely manner, and then to decide on the therapeutic method choice. Proper diagnostics saves time and avoids unnecessary demanding therapeutic procedures.

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## Declaration of interest

The authors declare that there is no conflict of interest.

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