

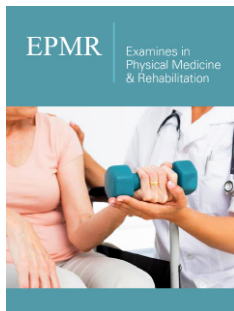
# Different Types of Cysts: Endodontic Versus Surgical Treatment

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## Abstract

This article wants to show you the best treatment for jaw cysts. The discussion goes on between endodontic conservative treatment and surgical one. The idea is to preserve the bone structure as much as possible and to preserve the tooth versus the bone addition and implant.

**Keywords:** Endodontic treatment; Periapical cysts; Surgical treatment; Healing of the bone loss

## Introduction

The periapical cyst is an inflammatory cyst which results because of extension of infection from pulp into the surrounding periapical tissues. As well as we know the etiology can be caries, irritating effects of restorative materials, trauma, pulp death due to development defects. The cyst is usually discovered when periapical radiographs of tooth with nonvital pulp are taken, because it is asymptomatic and presents acute pain diagnosis is confirmatory only with biopsy of these lesions [1]. We usually meet it mainly highest in anterior maxilla or in mandibular posterior teeth, separate small cysts arise from each apex of multirrooted teeth. In terms of signs and symptoms: slowly enlarging swelling attains a large size; as the cyst enlarges in size, the covering bone becomes thin and exhibits springiness due to fluctuation. At the level of the affected tooth we will observe that it is nonvital, discolored, fractured or shows failed root canal. We have two types of periapical cysts: one is cyst formation in periapical area which involves epithelial lining has no communication with root canal. The other named pocket or bay cyst which means epithelial lined cystic cavity is in communication with the root canal system. According to the World Health Organization (WHO), an apical cyst (pocket or true) is classified as an inflammatory and not a neoplastic lesion. The incidence of cysts within periapical lesions varies between 6 and 55% [1]. From a radiological point of view periapical cyst appears as round, pear or ovoid-shaped radiolucency, outlined by narrow radiopaque margin. For treatment we have five different methods: endodontic treatment, apicoectomy, extraction (severe bone loss), enucleation with primary closure, marsupialization (in case of large cysts) [2,3].

## Material and Method

A database search in PubMed, PubMed Central was conducted, using appropriate key words to identify clinical cases of endodontic conservative treatment versus surgical ones. The search strategy retrieved 1758 articles records in total and 23 records fulfilled the inclusion criteria.

## Nonsurgical Management of Periapical Cyst: Endodontic Treatment

When the periapical lesion size increase, the association of the radicular cysts increases [4]. Five big steps are involved in nonsurgical treatment of a periapical cyst: drainage, canal instrumentation that should be done 1-3mm beyond the apical foramen by using crown down or step back technique, irrigating with physiological serum and 1-2,5% sodium hypochlorite, calcium hydroxide  $\text{Ca}(\text{OH})_2$  and the most important step is the follow up for see if the lesion decrease from radiological point of view [1,5]. Endodontic treatment involves elimination of the infection, the immune system is able to promote repair and lesion might recede by the mechanism of apoptosis similar to the resolution of inflammatory apical pocket cysts without

any need of surgical intervention to remove cyst epithelium [1,6]. When the periapical lesion decreases the periapical inflammation is decreased, there will be a reduction in inflammatory mediators, pro inflammatory cytokines, with growth factors released by innate and adaptive immune cells and the epithelial cells of a cyst's lining epithelium will die of apoptosis [1,7]. In a study made by Caliskan MK [8] reported 73.8% success in nonsurgical management of large cyst-like periapical lesions using calcium hydroxide medicament [1,9]. *C. albicans* is present in resistant and secondary endodontic infections as well as in periapical lesions, so we need irrigations with NaOCl 1-2.5% which has shown bactericidal effect against *C. albicans* and *E. faecalis* [1,9]. Calcium hydroxide is used because of its high alkalinity and bacterial effects including neutralizing bacterial endotoxins; the period of time to leave it in the root canal should be between 2-3 weeks [10,11]. The diffusion of it through the apical foramen produces inflammatory action sufficient to break the cystic epithelial lining, followed by connective tissue invagination with ultimate healing [12]. The action of the calcium hydroxide beyond the apex it is seen from four perspectives: neutralization of acid products; anti-inflammatory activity; activation of the alkaline phosphatase; antibacterial action Flavia Maria de Moraes Ramos-Perez et al. [13] have reported a case in which a periapical cyst appeared shortly after an endodontic treatment and the patient required a retreatment and a follow up of the lesion [14]. On the other hand Xian Xiao et al. described a pathological fracture of the mandible caused by radicular cyst which has developed on a previously treated endodontic tooth.

### **Surgical Management of Periapical Cyst: Apicectomy, Extraction, Enucleation with Primary Closure, Decompression, Marsupialization**

The treatment choice depends on the size and localization of the lesion, integrity of the cystic epithelial lining, proximity of the cyst to adjacent vital teeth anatomical structures (maxillary sinus, mental foramen, infraorbital foramen, nasal cavity, inferior alveolar canal) and behavior of the cyst (radiological invasiveness and clinical aggressiveness) [15,16]. Odontogenic cysts limited, less than 5 cm, are usually managed by enucleation, whereas larger ones, exceeding 5 cm, are often decompressed or marsupialized [15]. Marsupialization of odontogenic cystic lesions it is a technique where a large window is made in cystic wall and then sutured to the oral mucosa [15,17]. Decompression can be performed by using devices such as tube or stent, it's based on creation a window between the cyst and the oral cavity by fixing the device; it is more conservative than marsupialization [15,18-20]. Usually after decompression, follow by cyst's enucleation we will need bone reconstruction of the cyst cavity and dental implant placement and restoration [15,21,22]. If we decide to keep the tooth involved in the cyst we will have to do endodontic treatment as well as enucleation and apicectomy in the same stage [15]. Ausra Dembinskaite et al. [23] reported a case of successful treatment of dens invaginatus type 3 with infected invagination, vital pulp and cystic lesion by using the combination between endodontic treatment and surgical one.

### **Conclusion**

The big advantage of non-surgically managing is that the psychological trauma is less and is more comforting to the patient especially when he is a child. It is well implemented the follow up for all endodontic treatment and more when we do a nonsurgical treatment of a periapical cyst to avoid the complications. Surgical management would have involved removal of diseased periapical tissue and possibly apicectomy. For the periapical cysts it is much better to start with the endodontic treatment and after a follow up and for odontogenic cysts we must mix between surgical: extraction of the teeth associated with cyst, decompression, marsupialization, enucleation with primary closure and endodontic treatment. We have to choose what is best for the patient pronouncing from the endodontic treatment but we must not exclude a combination of their endodontic-surgical treatment if that is the key to success.

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