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ORIGINAL ARTICLE

Nonsurgical treatment of pathological cysts of dental origin

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Abstract

Background: Radicular cysts (RC) of dental origin are slow-growing lesion which is asymptomatic in most of the cases. The management of the RC is still existing over a debate. Therefore, we present a study of nonsurgical management of pathological cysts of dental origin.

Aim: To study the success of non-surgical management of patients presenting with pathological cysts of dental origin in terms of healing and recurrence.

Materials and methods: Prospective study was done in 25 patients presenting with pain and swelling in the conservative and endodontics department for a period of 2 years. The cystic cavity was opened and drained using various methods such as decompression, aspiration-irrigation, CAOH and lesion sterilization.

Results: The success rate of nonsurgical treatment was 80 % while 12% of cases presented with recurrence and 8% of cases had delayed healing.

Conclusion:

Follow-up and assessment of healing are essential after nonsurgical treatment of the cysts. The surgical approach is used for cases which are refractory to nonsurgical method.

Keywords: Nonsurgical method, CAOH, Decompression, aspiration-irrigation, Cyst

1 | INTRODUCTION

Dental cysts are a cavity containing fluid or soft tissue material lined by epithelium[1]. It can be traced at the crown of an unerupted tooth or the tip and end of a dead root. Dental cysts are formed due to repeated trauma, infections and poor dental hygiene[2]. It is also linked to genetic syndromes such as Gorlin's syndrome[3]. Follicular dental cyst, keratocyst, retromolar dental cyst, eruption dental cyst, radicular dental cyst and residual dental cyst are the six types of dental cyst[2].A cyst is usually diagnosed incidentally on X-ray, however few patients present with pain or swelling. Endodontic therapy restores the involved teeth using the nonsurgical treatment such as enucleation, decompression, calcium hydroxide or aspiration irrigation technique and repair therapy[5]. We have studied nonsurgical management of patients presenting radicular cysts in the present study.

Materials and methods

Twenty-five patients were studied prospectively, presenting with swelling and pain to the department of con-servative and endodontic for a period of 24 months in KVG Dental college and hospital.

Inclusion criteria:

Positive findings on intraoral examination.

Radiology revealing radiolucency correlating with clinical finding.

Exclusion criteria:

Patients having hypertension, diabetes mellitus or immune-compromised state.

Patients that are not willing for non-surgical treatment.

2 | METHODS

Clinical details along with all the necessary findings were noted. Dental history of trauma, infection with duration and progression of pain and swelling was taken. The extra-oral and intra-oral examination was done, location and size were noted. A provisional diagnosis of the cyst was made. The patient was then referred for orthopantogram, intra-oral periapical and an occlusal radiograph for the exact location, size and confirmation of the clinical diagnosis. Cold and electric test was done to check the pulp vitality. If the root canal was found to be involved, the involved tooth was opened and the fluid was expressed out. The patient was then counselled with merits and demerits along with complications of each procedure. 25 patients were willing to opt for nonsurgical management, the fluid was then sent to the department of pathology for the cytological diagnosis and to rule out any malignant pathology, if any. K file was used to prepare and to access the root canal. The opening was sealed with an intermediate restoration. On the second visit, the intermediate restoration was removed and various non surgical methods such as aspiration and irrigation technique of the cystic fluid using a buccal palatal approach with 18 gauge needle, calcium hydroxide beyond the apex method, lesion sterilization by using a paste of ciprofloxacin, metronidazole and minocycline antibiotics, decompression technique by using negative pressure created by using a suction aspirator connected to micro 22 gauge needle inserted in the root canal were used on different patients depending upon location and patients compliance. After two weeks, definitive restoration was placed and the case was followed up with clinical and radiographic investigation every 6 months for a period of 24 months. If the pain or the swelling reappeared of if there was an increase in radiolucency size or if there was radiological evidence of root resorption the surgical treatment was given to the patients and the conservative or nonsurgical treatment was considered a failure. The success of the case was determined by considering the apical radiolucency on pre- and post-operative periapical radiograph. The periapical index (PAI) was used for scoring, single observer was used to eliminate intra-observer variability. All records were digitalized and radiographs were observed under magnification. PAI scores of 1-2 were considered success and 3-5 were considered a failure.

3 | RESULTS

TABLE 1: shows the distribution of cases according to age.

Age	No. of cases
25-30	03
31-35	08
36-40	05
41-45	08
›45	01
Total	25

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In the present study maximum number of patients were seen in the 3^{rd} -4^{th} decade. 3 cases were seen in 25-30 years and 1 case was noted in >45 years of age.

TABLE 2: shows the distribution of cases according to symptoms

Symptoms	No. of cases
History of pain	12
History of discomfort	01
History of swelling	12
Total	25

As shown in the above table, 12 patients presented with a history of pain and swelling respectively, while 1 patient had complained of discomfort.

TABLE 3: shows the distribution of cases according to the site of the lesion

Site	No. of cases
Mandibular anterior	08
Mandibular posterior	02
Maxillary anterior	10
Maxillary posterior	05
Total	25

According to table 3, the most common location or site of the cyst was maxillary anterior followed by mandibular anterior. Maxillary posterior had 5 cases. The least common location was mandibular posterior with 2 cases.

TABLE 4: shows distribution of cases according to Radiological diagnosis.

Radiological diagnosis	No. of cases
Cystic	18
Solid-cystic	07
Total	25

According to the above table, the most common radiological finding was cystic with 18 cases. Solid-cystic was observed in 7 cases in the present study.

The cytological diagnosis of all the cyst was of benign cystic lesion in the present study.

According to the above table, the most common treatment modality done on patient was CAOH followed by aspiration-irrigation and decompression.

TABLE 5: shows the distribution of cases according to cytological diagnosis

Cytological findings	No. of cases
Benign cystic lesion	25
Total	25

TABLE 6: Shows the distribution of cases according to treatment modalities

Treatment modalities	No. of cases
Aspiration-irrigation	06
CAOH	14
Decompression	03
Lesion sterilization	02
Total	25

The least common was treatment modality done on patients was lesion sterilization.

TABLE 7: shows no of cases with successful management of the pathological cyst of dental origin

Follow-up of the cases	No. of cases	Percent-age
Successful management	20	80
Recurrence	03	12
Delayed healing	02	8
Total	25	100

As shown in table no. 7, the success rate of nonsurgical treatment was 80 % while 12% of cases presented with recurrence and 8% of cases had delayed healing.

4 | DISCUSSION

Pathological dental cyst treatment is conundrum[6]. Nonsurgical treatment is not a recent discovery, it started in 1952 when Summer, Ostrander and Crowley introduced I shaped rubber dam wick in the periapical region which was to be changed every 2 weeks. The main aim of this procedure was to pronounce the healing process by relieving the cavity pressure of the cyst. Bhaskar et al 1972 description of the nonsurgical method for the treatment of the dental cysts (RC) has undergone changes and it has

shown massive success in the treatment of radicular cysts. Reit and Goran-Grondahl in their study reported that nonsurgical endodontic treatment modality was more preferred than periapical surgery[9]. In the present study, most of the cases were in the 3^{rd}-4^{th} decade with 8 cases. 3 cases were seen in 25-30 years and 1 case was noted in >45 years of age which is in contrast to a study done by Shah Naseem[10], where he observed a maximum number of cases in 10-20 years of age. In the present study, most of the patients presented with a history of pain and swelling while in a study by Shah Naseem[10] most patients presented with painless gumboil. The most common location or site of the cyst was maxillary anterior followed by mandibular anterior in the present study, the findings are in line with the study done by Shah Naseem[10], where he reported maxillary anterior as the most common teeth affected followed by mandibular anterior. In the present study, definitive diagnosis was based on radiology where most cases showed radiolucency due to fluid i.e. cystic nature of the fluid and cytological evidence of benign cystic lesion. Shah Naseem[10] in their study reported radiolucency of various sizes in the periapical region. The treatment choice is determined by various factors such as origin, characteristics and extension of the lesion, relationship with the structures of origin and surroundings and compliance of the patients. In the present study, the most common treatment modality done on the patient was CAOH method followed by lesion sterilization. The least common treatment modality done on patients was aspiration-irrigation. Case report[11] have used similar treatment modalities in their study. CAOH has antibacterial action as it acts on the cytoplasmic membranes of the bacteria and it also damages bacterial DNA[12]. Decompression is a procedure which can remove the cystic content which has microbial load by creating negative pressure and enhance the process of healing. Due to the decrease in inflammatory mediators, the cells are deprived of growth factors which leads to programmed cell death which is known as apoptosis which leads to regression of the cyst/lesion[13]. In aspiration and irrigation technique 18-gauge needle is used and the cystic fluid is aspirated using the buccal palatal approach. Lesion sterilization is done by using a paste of ciprofloxacin, metronidazole and minocycline. In the present study, the criteria for success after 2 years of follow-up every 6 months were as follows: 1. Absence of pain, swelling and discomfort. 2. Proper healing and repair process. 3. Radiological evidence of the healing process. The success rate of nonsurgical treatment was 80% while 12% cases presented with recurrence and 8% of cases had delayed healing. Studies have shown that nonsurgical management of periapical lesion/cyst has a success rate of up to 85% which is similar to our study. Murphy WK[1] in their study after nonsurgical management has reported 94.4% complete and partial healing of the periapical lesion. Shah Naseem[10] reported 84.4% successful conservative treatment and 15.6% patients had to undergo surgery. He also reported 50% failure at or after 1-year treatment. Wound healing is a complex process; thus, healing of the lesion was assessed in the study by using the periapical index[15]. Wound healing after nonsurgical treatment of the dental cysts follows the principles of connective tissue wound healing of the body.

5 | CONCLUSION

The blood supply and the nerve supply may get damaged if a larger cyst, if treated surgically therefore nonsurgical management, is unavoidable in such cases. Most of the cysts resolve and heal following the conservative method. However, follow-up and assessment of healing are essential. The surgical approach is used for cases which are refractory to the nonsurgical method.

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Conflicts of Interest of each author/ contributor:

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