

## Right Attitude, Right Decision and Timely Planning in Surgical Pedodontics –Scoop Out or Expose It

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### ABSTRACT

Radicular cysts are the most common odontogenic cystic lesions of inflammatory origin and are usually asymptomatic and are left unnoticed, until detected by routine radiography. It is managed either by surgical enucleation or marsupialization. Conventional nonsurgical endodontic treatment has a high degree of clinical success, but in certain cases surgical intervention becomes necessary. This is the case report of a patient presenting with unilateral radicular cyst. The lesion is managed by marsupialization using a novel and safe method of separating the soft tissue mass of the periapical lesion which was in proximity to vital and vulnerable anatomical tissue, emphasizing the need of application of treatment in the best interest of patients.

The treatment of choice is dependent on the size and localization of the lesion, the bone integrity of the lesions wall and its proximity to vital structure. This case report of radicular cysts emphasis on the advantages and disadvantages of the leading criteria that should be taken into consideration when assessing the treatment modalities for radicular cyst.

**Keywords:** Odontogenic cysts, Radicular cyst, Marsupialization, Enucleation.

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### Introduction

In primary dentition Radicular cysts, dentigerous cysts and eruption cysts are the most frequently occurring odontogenic cysts of the teeth bearing areas<sup>1</sup>. Amongst which frequent odontogenic cysts is the radicular cyst also called periapical cyst or apical periodontal cyst or root end cyst. The usual etiology is an infected tooth leading to necrosis of the pulp. Toxins exit at the apex of the tooth leading to periapical inflammation. This

inflammation stimulates the epithelial rests of Malassez, which is found in the apical periodontal ligament, resulting in the formation of a periapical granuloma that may be infected or sterile. Gradually, this epithelium undergoes necrosis because of a lack of blood supply, and the granuloma becomes a cyst (Periapical cyst). When lesions are small they cannot be detected clinically but most often are discovered as incidental findings on radiographic survey<sup>2</sup>.

Prevalence of radicular cysts in the primary dentition is 0.5 to 3.3% of the total number of odontogenic cysts<sup>3,4</sup>. In a survey of radiolucent lesions associated with primary molars, Mass et al observed that 73.5% were diagnosed as radicular cysts<sup>5</sup>. Most radicular cysts found in the primary dentition are associated with mandibular molars; which are affected with dental caries. The majority of cases of apical periodontal cysts are asymptomatic. This type of cyst is only infrequently of such a size that it destroys much bone, and even more rarely does it produce expansion of the cortical plates. The radicular cyst is a lesion that represents a chronic inflammatory process and develops only over a prolonged period of time<sup>5</sup>.

Diagnosing a radicular cyst several studies have indicated that it is not possible to rely on the radiographic size of periapical radiolucency to establish the diagnosis of either cyst or granuloma unless the lesion is larger than 2 cm in diameter. According to Livingston, the growth rate of a radicular cyst is estimated to be approximately 5mm in diameter annually<sup>6</sup>. Hill reported that the growth rate of a radicular cyst in the primary dentition was estimated to be 4 mm annually. Grudy et al states that pulpal therapeutic agents in primary teeth may cause antigenic necrotic materials within the root canals to provide continuing antigenic stimulation. This hypothesis doesn't imply that prohibition of medicaments for pulp treatment of primary teeth is necessary, as the incidence of radicular cysts in primary teeth is extremely low<sup>7,8</sup>.

Histopathological picture of radicular cyst shows increased number of lymphocytes, plasma cells (cart wheel appearance), Russels and Rushton bodies. Treatment choices include extraction of the underlying primary tooth and preservation of permanent teeth. Some practitioners prefer enucleation only, whereas others prefer marsupialization<sup>9</sup>. Mandibular cysts are normally

marsupialized into the oral cavity, although maxillary cysts can also be marsupialized into the maxillary sinus or nasal cavity, as well as the oral cavity. In many parts of the world, marsupialization is still described as a Partsch I procedure (the Partsch II procedure is enucleation and primary closure). In the Partsch I procedure, a window at least 1 cm in diameter is made in the cyst lining to the oral cavity<sup>10</sup>.

### Case Report

A 9 year old boy reported to our department with a chief complaint of non painful right mandibular swelling since 6 months. Patient was completely asymptomatic before six months. His medical history was unremarkable. Extra oral examination revealed a firm bony swelling extending from the corner of the mouth to the angle of the mandible anterioposteriorly and from the imaginary line drawn at the level from the corner of the mouth to the lower border of the mandible (Fig 1). Intraoral



Fig. 1: Extraoral Photograph

examination revealed presence of carious 84 and 85, upon vitality examination 84, 85 and 46 were nonvital. Patient had no history of pain or any

treatment or medication in relation to the above mentioned condition.

Radiographic investigation by occlusal radiograph revealed buccal expansion which was associated with the right mandibular premolar and expansion of the buccal cortical plate. Panoramic radiographs revealed radiolucency of 2.5 X 3.5cm in size involving the mandibular right primary

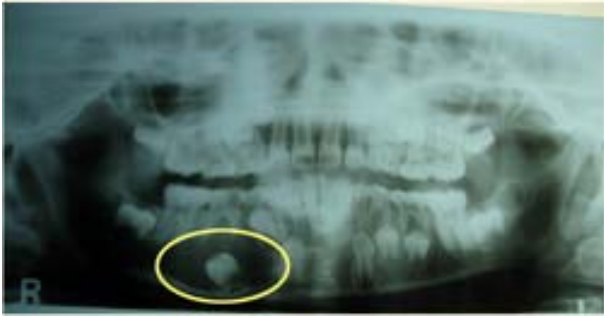


Fig. 2: OPG preoperative

molar 84, 85 and 46, permanent premolar tooth buds (fig 2). Aspirational biopsy confirmed the provisional diagnosis of severely inflamed radicular cyst and histological picture from the post-operative specimen of the lesion showed ill defined cystic lumen lined by discontinuous parakeratinized stratified arcading pattern at focal areas. As underlying connective tissue showed diffusely scattered severe chronic inflammatory cells comprising chiefly of lymphocytes, proliferating endothelial cells along which budding capillaries were also evident. Numerous dilated blood vessels along which extensive areas of hemorrhage were also noted. All the histological findings were suggestive of Radicular cyst.

The cariously involved teeth 84, 85 were extracted which created a surgical window for marsupialization of the cyst in order to save the involved tooth buds. After the removal of the cystic contents betadine gauze pack was used to pack the cavity. Lingual arch holding appliance was given and root canal treatment was performed for 46. The patient was recalled at

periodic intervals and the dressing was changed every three days interval for first 1 month, after every 1 week for next three months and later for every 15 days for next 6 months. After 1 year of follow up the lesion has healed completely and also the premolar tooth which was initially lying 3mm from the lower border of the mandible in distal inclination has erupted to the normal position (Fig 3 & 4).



Fig. 3: OPG Postoperative



Fig. 4: Clinical Postoperative

## Discussion

Most commonly in primary teeth periapical radiolucencies are related to radicular cysts; were as in permanent teeth its related to dentigerous cyst<sup>11</sup>. So in diagnosing these type of lesions careful evaluation of radiographs taken from different angles and of differing densities. Advanced radiography such as RVG, CT scan, CBCT can help in making the correct diagnosis. Based on these Wood et al have set guidelines for differential diagnosis of periapical lesions as radicular cysts for primary tooth and dentigerous

cysts for permanent teeth. Irrespective of the diagnosis, the treatment options for these lesions should be kept as conservative as possible, but may not support or be suitable for every situation<sup>12</sup>.

The surgical approach to cystic lesions of the jaws is either marsupialization or enucleation. Depending on the size, localization of the lesion, the bone integrity of the cystic wall and its proximity to vital structures the treatment should be planned. Cysts are usually enucleated, where the cystic lining is separated from its inner bony surface and removed and the cavity fills with blood clot. Alternatively the cyst may be marsupialized to relieve the internal pressure<sup>13</sup>.

According to Neaverth, marsupialization consists of deroofing the outer wall of a cyst by surgical incision and establishing a permanent opening by suturing the remaining cystic wall to the mucosal surface followed by an obturator treatment<sup>14</sup>. With decompression or marsupialization, the lining appears to become thicker and easier to enucleate and histologically it does appear to change and resemble normal oral mucosa, both with routine histology and with immunohistochemistry including bcl-2 and cytokeratin 10 immunostaining<sup>15,16</sup>.

In our case the marsupialization technique applied with extraction of associated primary teeth and preservation of permanent tooth buds appeared to be the most suitable treatment option with a healing period not exceeding 11 months with a normal alignment of permanent teeth that occurred spontaneously.

For some patients, decompression or marsupialization is impractical or difficult to perform. Patients in this category would include those who are unable to cooperate with the oral hygiene regimen that is necessary, patients for whom the time frame is inappropriate (marsupialization can take a year or longer to perform), or for reasons of patient preference. In

such cases enucleation can be followed by cryotherapy using a liquid nitrogen spray<sup>17</sup>. It has been shown that enucleation alone for the management of these lesions is unacceptable.

Surgical management of large maxillary cysts may result in loss of bone and vital teeth in proximity to the defect. Literature regarding treatment options and their outcomes are scarce and vague. Marsupialization is favored because of Lower morbidity and the fact that bony ingrowth occur as the lesion shrinks in size, resulting in more normal bony contour. But it requires a long period of postoperative management imposing a burden on the patient. Thus the key factor in reduction of cystic lesion is reduction of intracystic pressure. In regard to large cystic lesions marsupialization, is the viable treatment modality<sup>14,18</sup>.

### Conclusion

The clinical cases illustrates the possibility of complete healing and conservation of vital structures using minimal invasive approach. Despite the disadvantages of the marsupialization technique, and considering the unnecessary loss of bone and vital teeth obtained with the enucleation, the marsupialization revealed to be more advantageous in many respects and is therefore considered a worthwhile procedure for cases with the large localized radiolucent areas which involves the antrum, tooth buds, and approximating the vital structures.

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