

Odontogenic cysts- A clinicopathological study of 120 cases

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Abstract: Odontogenic cysts are pathological lesions originating from tooth forming structures and they deserve critical attention due to the complications they cause. We report a study of 120 cases of odontogenic cysts with the features recorded as age, sex, site, etiology, incidence, radiological features and histological features for confirmative diagnosis.

Key words: Odontogenic cysts, developmental cysts, inflammatory cysts.

I. Introduction

A cyst is a pathological cavity lined by epithelium filled with fluid, semi-fluid and gaseous material which in turn is lined by capsule of connective tissue. Odontogenic cysts are pathologies originating from the tooth forming apparatus. They grow slowly and do not cause significant clinical symptoms. Since they grow within the bones they cause tooth or bone resorption, bone expansion, fracture or tooth displacement¹. It is considered that cystic proliferation and degeneration of epithelium lead to the development of odontogenic cysts. These cysts are divided into two main categories: developmental and inflammatory. Developmental cysts are of unknown origin, and do not appear from inflammatory process, while inflammatory cysts are associated with inflammation². Apart from this World Health Organization (WHO) has classified epithelial cysts as odontogenic cysts (inflammatory and developmental) and non-odontogenic cysts (nasopalatine and nasoalveolar). Cysts without epithelial lining (pseudocysts) are non-neoplastic bone lesions which includes solitary bone cyst and aneurismal bone cyst³. We present a study performed on 120 cases that were diagnosed with different types of odontogenic cysts.

II. Study design

The study was conducted in the department of Oral Surgery at Bapuji Dental College, Davangere, Karnataka. A total number of 120 cases were examined, diagnosed, treated and followed up over a period of 3 years (2009-2012). The features recorded were age, sex, site, etiology, incidence, radiological features and histopathological features for the confirmed diagnosis.

Out of 120 cases, 80 were male and 40 were female. An attempt was made to categorize the etiological factors like trauma, attrition, abrasion and caries. Each jaw was divided into 4 zones namely incisor-canine, premolar, premolar-molar and molar region. Ramus and angle area were included for mandibular molar region. Radiographical analysis was done by performing periapical, occlusal, paranasal sinus and panoramic radiographs. A fine needle aspiration biopsy was performed in cases with definite clinical and radiological features.

The treatment plan for small cysts consisted of enucleation followed by primary closure, while for larger cysts marsupialization was done to facilitate decompression followed by enucleation. All the tissues were sent for histopathological diagnosis in department of oral pathology for confirmation. The follow-up was done with clinical and radiological investigations. An clinical examination was done to evaluate symptoms like pain, swelling, discoloration and loosening of teeth. Pathological findings like infection related to surgery and recurrence of cysts were assessed objectively. Healing of bony defect was assessed by post operative radiographs.

III. Results

The present study consisted of 120 cases with 80 males and 40 females. The age of the patients varied from 10-57 years with 48 cases in the age group of 21-30 years. Among 120 cases, the site of involvement of cyst was maxilla in 76 cases (63.3%) and mandible in 44 cases (36.7%). The incisor-canine area was the major site of involvement in maxilla (50%) followed by premolar region in 2 cases (6.7%) and one each in premolar-

molar and molar region. In mandible molar-angle-ramus area was affected in 16 cases (13.4%), incisor canine and premolar area were equally affected in 12 cases each and in 4 cases premolar-molar area was involved.

The type of cysts observed in the study were radicular cyst found in 60 cases (40 males and 20 females) followed by dentigerous cyst in 40 cases (28 males and 12 females), residual and keratocyst in 8 cases each and 4 cases of Gorlin's cyst with equal gender distribution. The incidence of radicular cyst was 50% followed by dentigerous cyst which was 33.3%, while the incidence of residual and keratocyst was 6.7% and of Gorlin's cyst was 3.3%. Among these cases 44 cases of radicular cyst occurred in the maxilla and 16 occurred in the mandible. Dentigerous cyst was equal in both jaws while residual and Gorlin's cyst were seen in maxilla and keratocyst were seen in mandible.

The method of treatment was enucleation with primary closure in 76 cases, enucleation with open packing in 32 cases while 12 cases were treated with marsupialization followed by enucleation with open packing. Hundred cases were done under local anaesthesia and 20 cases were done under general anaesthesia.

IV. Discussion

The radicular cyst is a chronic inflammatory lesion with a cavity lined by a non-keratinized stratified squamous epithelium. It is the most frequent cyst found in the jaw ranging from 38%-68%⁴ which is consistent with our study as the frequency of radicular cyst in our study was 60%. It is said to arise from the epithelial remnants in the periodontal ligament as a result of inflammation. Usually it is asymptomatic and is discovered during radiological analysis as a round or pear shaped unilocular radiolucent lesion surrounded by thin radiopaque margin extending from lamina dura of the involved tooth and may displace adjacent teeth or cause mild root resorption^{5,6}. Although the source of epithelium is usually a cell rest of Malassez but other sources like crevicular epithelium, sinus lining or epithelium lining of fistulous tracts have also been considered⁷. Recently the role of VEGF (Vascular Endothelial Growth Factor) and MMP-9 have been suggested in the angiogenesis of radicular cyst⁸. It occurs commonly in males involving maxillary region in the 3rd to 5th decade of life which is same in our study as the incidence of radicular cyst have found to be 44 cases in the maxilla and 16 in the mandible.

Dentigerous cysts are odontogenic developmental cysts which generally occurs solitary or unilaterally commonly associated with mandibular 3rd molars, maxillary canine, mandibular 2nd premolar and maxillary 3rd molars⁹. They occur commonly in adolescents and young adults and often involve mandibular molars; which is consistent with our study as the age of the patients varied from 21-30 years. The exact etiopathogenesis of dentigerous cyst is unknown but it has been proposed that the crown of a permanent tooth may erupt into a radicular cyst of a primary predecessor resulting in the formation of an extra follicular dentigerous cyst. This theory was rarely accepted because radicular cyst involving primary dentition is extremely rare¹⁰. There are no characteristic histopathological features which can be used reliably to distinguish the dentigerous cyst from other types of odontogenic cysts. It is usually composed of thin connective tissue wall with a thin layer of stratified squamous epithelium lining the lumen¹¹.

Odontogenic keratocyst (OKC) is a benign intraosseous odontogenic tumor occurring from first to ninth decade of life with males commonly affected than females. The mandible is involved more than the maxilla¹² which is same in our study also. It involves approximately 10% of all jaw cyst with predominance in molar-angle-ramus area¹³ which is consistent with the area involved in our study also. On clinical examination OKC presents itself as swelling, pain, discharge, aggressive growth, invasion of adjacent structures, recurrence and localized asymptomatic swelling which is the most common symptom¹⁴. In our study the patients were found only with the clinical symptom of swelling and pain. Radiographically OKC shows unilocular or multilocular radiolucency with scalloped and well defined margins which is same as the radiographic details in our study also.

The calcifying cystic odontogenic tumor or Gorlin's cyst was first described by Gorlin in 1962 and it was recognized as a distinct pathologic entity by WHO in 1971. It is a benign cystic neoplasia constituting 2% of benign odontogenic lesions and representing 1% of odontogenic cysts¹⁵ which is consistent with our cases also (4 Cases). It is divided into 3 subgroups based on location (intraosseous and extraosseous) and histologic features¹⁶. It shows ameloblastoma like ghost cells that may calcify and has been shown to have diversity in its clinical and histologic features. Clinically, it presents as a painless slow growing tumor, equally affecting maxilla and mandible involving most commonly the incisor-canine area. It occurs in third to fourth decade of life with no gender predilection¹⁷ which correlates with our study also. The characteristic features of Gorlin's cyst is the presence of ghost cells which are also found in other tumors like Malherbe calcific epithelioma of skin, ameloblastic fibro-odontoma, complex and compound odontoma, craniofaringioma, meloblastoma and carcinoma which should be excluded while reporting Gorlin's cyst. Since the nature of the ghost cells is unknown, the accepted theory states that there would be a squamous metaplasia of the epithelium with the subsequent keratinization which could be normal or aberrant.

It is concluded that association of different types of odontogenic cysts with the age, sex, site, etiology, incidence and histopathological features reveals that demographic knowledge can be helpful in early diagnosis and their prompt treatment.

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