

Clinicopathologic Profile of Patients with Radicular Cysts

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ABSTRACT

Background: Radicular cyst accounts for about 52% to 68% of all the cysts of the jaw in human. These are mostly seen in the third and fourth decade of life and shows male predilection. Hence; the present study was undertaken for assessing clinicopathologic profile of patients with radicular cysts.

Materials & methods: A total of 150 histopathologic confirmed cases of radicular cyst were enrolled. Complete demographic data of all the patients was recorded separately. A Perfora was made clinical details were separately recorded. Histopathologic reports were analysed and also recorded. Predilection of jaws and type of dentition was also recorded. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Mean age of the patients was found to be 40.1 years. Anterior maxilla was the most common site found to be involved in 40.67 percent of the cases. In the present study, deciduous dentition was involved in 12 percent of the cases. Females were involved in 54 percent of the cases. Local swelling was present in 55.33 percent of the patients; and well-defined radiographic outline was present in 67.33 percent of the cases. Stratified squamous lining was present in 98.67 percent of the cases. Hyaline bodies were present in 6.67 percent of the cases. Odontogenic rests were seen in 12.67 percent of the cases. Cholesterol clefts were seen in 35.33 percent of the cases.

Conclusion: Radicular cyst is a common type of peri-apical pathology affecting significant proportion of patients. The most commonly affected site for periapical lesions was the maxillary anterior region with females more frequently affected in comparison to males.

Keywords: Radicular cyst, Jaws, Odontogenic.

INTRODUCTION

The cyst is defined as “a pathological cavity having a fluid, semi fluid or gaseous contents and which is not created by the accumulation of pus”. Radicular cyst accounts for about 52% to 68% of all the cysts of the jaw in human. These are mostly seen in the third and fourth decade of life and shows male predilection. Radicular cyst is the most common odontogenic cyst of inflammatory origin. It is almost

all the times associated with pulpal necrosis leading to inflamed periapical tissues. The cyst is usually asymptomatic unless infected. Radiographically, it presents as a well-defined unilocular radiolucency. Although, multilocular radiolucent radicular cysts have also been reported, which is extremely rare and there are very few reported cases.¹⁻³ Assuming that the developmental mechanisms of radicular

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cysts are identical in the primary and the permanent dentitions, the low frequency in the former is yet to be clarified. Microbial causes consist of intraradicular infection, actinomycosis and other extraradicular bacteria; whereas non-microbial causes comprise cystic apical periodontitis, cholesterol crystals, foreign bodies, and scar tissue healing. In addition to radiolucency of pulpo-periapical origin, various other lesions can occur in the periapical region; these include dentigerous cyst, cementoma, periapical cementoosseous dysplasia, periodontal diseases, traumatic bone cyst, non-radicular cyst, odontogenic keratocyst, malignant tumor, and other rarities.^{4, 5} Hence; the present study was undertaken for assessing clinicopathologic profile of patients with radicular cysts.

MATERIALS & METHODS

The present study was conducted for assessing the clinico-pathologic profile of patients with radicular cyst. A total of 150 histopathologic confirmed cases of radicular cyst were enrolled. Complete demographic data of all the patients was recorded separately. A Performa was made clinical details were separately recorded. Histopathologic reports were analysed and also recorded. Predilection of jaws and type of dentition was also recorded. Diabetic patients, hypertensive patients and patients with presence of any metabolic bone disorder were excluded. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi-square test was used for evaluation of level of significance.

RESULTS

In the present study, a total of 150 cases of radicular cyst were analysed. Mean age of the patients was found to be 40.1 years. Anterior maxilla was the most common site found to be involved in 40.67 percent of the cases while anterior mandible was found to be involved in 28.67 percent of the cases. Posterior maxilla and posterior mandible was involved in 16 percent and 14.66 percent of the patients.

In the present study, deciduous dentition was involved in 12 percent of the cases. Females were involved in 54 percent of the cases. Local swelling was present in 55.33 percent of the patients; and

well-defined radiographic outline was present in 67.33 percent of the cases. In the present study, while analysing the histopathologic profile, it was seen that stratified squamous lining was present in 98.67 percent of the cases. Hyaline bodies were present in 6.67 percent of the cases. Odontogenic rests were seen in 12.67 percent of the cases. Cholesterol clefts were seen in 35.33 percent of the cases. Dystrophic calcification was seen in 9.33 percent of the cases. Severe inflammation was present in 72.67 percent of the cases.

Table 1: Distribution of patients according to anatomic location

Location	Number of patients	Percentage
Anterior maxilla	61	40.67
Posterior maxilla	24	16
Anterior mandible	43	28.67
Posterior mandible	22	14.66

Graph 1: Distribution of patients according to type of dentition

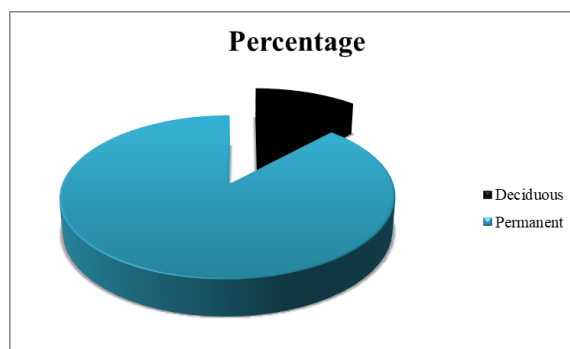


Table 2: Demographic and clinical profile

Profile	Number of patients	Percentage
Mean age (years)	40.1	
Gender		
Males	69	46
Females	81	54
Local swelling		
Present	83	55.33
Absent	67	44.67
Radiographic outline		
Well-defined	101	67.33
Ill-defined	49	33.33

Table 3: Histopathologic profile

Histopathologic features		Number of patients	Percentage
Epithelial lining	Stratified squamous only	148	98.67
	Muco-epidermoid	1	0.67
	Respiratory	1	0.67
Hyaline bodies		10	6.67
Odontogenic rests		19	12.67
Cholesterol clefts		53	35.33
Foamy histiocytes		22	14.67
Dystrophic calcification		14	9.33
Inflammation	Mild to moderate	41	27.33
	Severe	109	72.67

DISCUSSION

Odontogenic cysts are considered to be initiated by the proliferation of residues of tooth-forming epithelia. They are divided into 2 common groups, developmental cysts such as odontogenic keratocysts (OKCs) and inflammatory cysts such as radicular cysts (RCs). RCs form in the apical region and are the only infectious cyst and are most frequently seen in all kinds of odontogenic cysts. Conventional non surgical root canal therapy is the treatment of choice in management of teeth with large periapical lesions. When this treatment fails in resolving the periradicular pathosis alternative strategies like nonsurgical retreatment or periapical surgery must be considered. In case of very extensive lesions, as there is a chance for inadvertent undesirable consequences when surgical curettage is done, the procedures like Marsupialization or tube decompression are indicated.⁶⁻⁹ Hence; the present study was undertaken for assessing clinicopathologic profile of patients with radicular cysts.

In the present study, a total of 150 cases of radicular cyst were analysed. Mean age of the patients was found to be 40.1 years. Anterior maxilla was the most common site found to be involved in 40.67 percent of the cases while anterior mandible was found to be involved in 28.67 percent of the cases. Posterior maxilla and posterior mandible was involved in 16 percent and 14.66 percent of the

patients. Tavares DP et al analysed the clinical and radiological profile of a series of peri-apical cyst (PC) and peri-apical granuloma (PG) diagnosed in a Brazilian population. Clinical and radiological information were retrieved and data were tabulated and descriptively and comparatively analyzed. Final sample was composed by 647 inflammatory periapical lesions, including 244 PG (38%) and 403 PC (62%). The number of women affected by PG was significantly higher than the number of women affected by PC ($p=0.037$). Anterior region of the maxilla was the most common affected area for both entities (39% of the cases), but the most common anatomical location of PG (anterior maxilla and posterior maxilla) was different from PC (anterior maxilla and posterior mandible) ($p<0.0001$). Upper lateral incisor was the most affected tooth. The mean radiological size of the PC was larger than the mean radiological size of the PG ($p<0.0001$) and PC showed well-defined radiological images more frequently than PG ($p<0.0001$). PC were more common than PG, both showed predilection for adult females, most lesions affected predominantly the anterior maxilla and PC presented larger mean radiological diameter and well-defined images when compared with PG.¹⁰

In the present study, deciduous dentition was involved in 12 percent of the cases. Females were involved in 54 percent of the cases. Local swelling was present in 55.33 percent of the patients; and well-defined radiographic outline was present in 67.33 percent of the cases. Makoto Hayashi et al compared the cytokine expression profiles of cyst fluids (CFs) and tissue culture supernatants (SUPs) from 7 radicular cysts (RCs) and 7 odontogenic keratocysts (OKCs) by using Human Cytokine Antibody Array to identify the specific cytokines involved in formation and expansion of RCs and OKCs, respectively. There were significant differences in relative expression levels of IL-1 beta, MCP1, MIP1 beta, FGF-9, GDNF, HGF, IGFBP-3, Ang, IP-10, MIF, OPG, and TGF-beta2 between RC-CF and OKC-CF ($P < .05$). On the other hand, the cytokine expression patterns of RC-SUP (HGF, IL-8, NAP-2, IL-6, TIMP-1 and 2, GRO, IP-10, and Ang) were similar to those of OKC-SUP. Only the relative expression level of GRO differed between RC-SUP and OKC-SUP ($P < .05$). The similarities of cytokine production by tissue cultures derived from RC and OKC indicate that the expansion mechanisms of RC

and OKC might involve similar biologic mechanisms other than infection.¹¹

In the present study, while analysing the histopathologic profile, it was seen that stratified squamous lining was present in 98.67 percent of the cases. Hyaline bodies were present in 6.67 percent of the cases. Odontogenic rests were seen in 12.67 percent of the cases. Cholesterol clefts were seen in 35.33 percent of the cases. Dystrophic calcification was seen in 9.33 percent of the cases. Severe inflammation was present in 72.67 percent of the cases. Hung-Pin Lin et al evaluated the clinical and histopathological features of periapical lesions sent to a private pathology laboratory by dentists in private clinics. The 252 periapical lesions consisted of 128 periapical granulomas, 117 periapical cysts, and seven periapical scars. These 252 lesions were taken from 252 patients (92 men and 160 women; mean age = 43.6 years; range, 9-81 years). Of the 252 periapical lesions, 186 were found in the maxilla and 66 in the mandible. The most common site for periapical lesions was the maxillary anterior region (134 cases, including 73 granulomas, 54 cysts and 7 scars), and the most frequently involved tooth was the maxillary lateral incisor (64 cases, including 29 granulomas, 31 cysts and 4 scars). Of the 117 periapical cysts, 116 were lined by stratified squamous epithelium and one by mucoepidermoid epithelium. Hyaline bodies were discovered in the lining epithelium of four periapical cysts. Odontogenic epithelial rest, cholesterol cleft, foamy histiocytes, hemosiderin-laden macrophages, dystrophic calcification, foreign bodies, and bacterial clumps were found in five, three, nine, two, 28, 10 and one periapical granulomas, respectively, as well as in six, 11, eight, seven, 19, nine and eight periapical cysts, respectively. Granulomas and cysts were the two most common periapical lesions.¹²

CONCLUSION

From the above results, the authors concluded that radicular cyst is a common type of peri-apical pathology affecting significant proportion of patients. The most commonly affected site for periapical lesions was the maxillary anterior region with females more frequently affected in comparison to males. However; further studies are recommended.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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