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Radicular Cyst classic presentation: A case report and review of clinical, radiological and histopathological features

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Abstract: *The radicular cyst is the most common inflammatory odontogenic cystic lesion of the jaws. The reported frequency varies from 7% to 54% of periapical radiolucencies. It usually originates as a sequel to a periapical inflammatory process, following chemical, physical or bacterial injury. Due to its chronic etiology, the cyst usually appears towards the later stage of life. The incidence of radicular cysts is greater in the third to sixth decades and shows a slight male predominance. Radicular cyst is the most common odontogenic cyst of the Jaws and is accidentally discovered on routine radiographic examination. This article reports a case of a radicular cyst in the mandible, its management and differential diagnosis.*

Keywords: *radicular cyst, odontogenic cyst, non-vitality, enucleation, epithelial cell rests of Malassez.*

I. Introduction

The radicular cyst is the most common odontogenic innflammation of the jaws. It originates from the epithelial cell rests of the Malassez periodontal ligament or of the surrounding bone, secondary to inflammation [1]. It is a slow growing cyst with a tendency towards bone resorption, generally 0.5 to 1 cm in size, even if a few cases of large cysts have been occasionally reported. The radicular cyst commonly shows a male predilection with maxillary anterior region as its prevalent site of involvement. Radicular cysts have been regularly associated with carious, non-vital teeth or teeth with a history of trauma [2]. The case of a mandibular radicular cyst showing some atypical features is presented herewith.

II. Case Report

A 52 Year old Male Patient came to our Department of Oral Medicine and Radiology DAV Dental College with a Chief complaint of Pain while eating in the mouth for the Past 1 month. History reveals one and half year back Patient when went to a dentist for decayed teeth. Their dentist attempted to extract the tooth no. 34 but extraction had not completed. Patient got an OPG and he came to our Out Patient Department, DAV Dental college for further treatment.

No obvious swelling or facial asymmetry was noted on extraoral examination. No sinus or fistula was evident extaorally. Regional lymph nodes were non-enlarged, non-palpable.(Figure.1) On intraoral examination. All teeth were vital except 34, none of the involved teeth being mobile, and pain on percussion was negative. No paraesthesia was noted.(Figure.2) Considering the extensive nature of the lesion, panoramic radiograph was planned. On radiographic examination, a large unilocular radiolucency was noted with bottle neck appearance, neck is associated with 34 wheareas the entire radicolucency extending from 33 to 35, with root resorption of the involved tooth and well-defined, well-corticated borders. The inferior border of the mandible was intact. Buccal and lingual cortical plates were intact, but expansion of the buccal cortical plate was seen in the 33 to 35 region(Figure.3).

Based on a detailed history, careful clinical examination and radiologic investigations, the following differential diagnosis of the current lesion has been established.

According to Wood and Goaz [3], if a well-defined radiolucency is observed at the apex of an untreated asymptomatic tooth with a non-vital or diseased pulp, and if the anatomic structures can be ruled out, the radiolucency is a dental granuloma or a radicular cyst in approximately 90% of the cases. Even if these entities cannot be distinguished by radiographic features alone, if radiolucency is 1.6 cm or more in diameter, it is more likely to be a cyst [4,5]. The radicular cyst is a common inflammatory odontogenic cyst of the jaws, originating from the epithelial cell rests of Malassez periodontal ligament or of the surrounding bone, secondary to inflammation. It is a slow growing cyst with a tendency towards bone resorption, generally 0.5 to 1 cm in size, however a few cases of large cysts have been occasionally reported. The radicular cyst commonly shows a male predilection, with the maxillary anterior region as its prevalent site of involvement. Radicular cysts have been regularly associated with carious, non-vital teeth or with teeth associated with a history of trauma.

The traumatic cyst is an idiopathic cavity which occurs in other bones as well as in jaws, being classified as a false cyst – once it has no epithelial lining. Classically, the TBC, located above the mandibular canal, is usually round to oval, with contoured, well-defined borders. Quite often, the superior border extends between the roots of the teeth, giving a scalloped appearance. Usually, it does not exceed 3cm in diameter, even if lesions have been reported in the entire ramus and body. Generally seen in patients under 30 years, it shows a slight male predominance [2].

The central giant cell granuloma/lesion may occur initially as a solitary, cyst-like radiolucency; as it grows larger, it frequently becomes a soap bubble type of multilocular radiolucency. The lesion is painless and grows slowly by expanding and thinning the cortical plates, but only rarely it perforates into the soft tissue. An expanding lesion may cause some teeth migration, and root resorption has been reported. Histopathologically, hemosidrin is seen as scattering throughout the lesion, along with many irregularly shaped giant cells. Also, an osteoid may be often seen within the lesional tissue. Results of serum chemistry tests should be studied to exclude the possibility of a giant cell lesion of hyperparathyroidism.

The peripheral cement-osseous dysplasia is by far the most common fibro-cemento-osseous lesion. In the early stage of development, PCOD occurs as a somewhat rounded radiolucency, with well-defined borders, associated with teeth having vital pulps. The lesion has a clear female predilection and is rarely recorded before 40 years of age. It is commonly seen in the mandibular anterior region. It is unusual for a PCOD to become large enough to produce a detectable cortical expansion.

The cemento-ossifying fibroma is a very common lesion of the mandible found in the premolar molar region at an average age of 30 years, with no specific gender predilection. Initially radiolucent, the lesion becomes radio-opaque within around 6 years, due to the progressive deposition of cementum and spicules of bone. A matured lesion appears as a well-defined radiopacity, usually surrounded by uniform radiolucency.

The odontogenic keratocyst, forming 5-11% of all jaw cysts, frequently appears as a well-defined radiolucency, occurring more commonly in the mandible and largely affecting the male population. In Shafer's series [6], 7.8% of all jaw cysts, 8.5% of the dentigerous cysts and 0.9% of all radicular cysts are odontogenic keratocysts.

The unicystic ameloblastoma formed inside the walls of a dentigerous cyst is the second most common pericoronal radiolucency. Ameloblastma represent approximately 11 to 13% of all odontogenic tumors. Usually locally invasive, initially asymptomatic, it causes cortical expansion and may perforate the cortices. It may also appear as an unilocular cyst or as a multilocular soap-bubble or honeycomb variety. Generally, it occurs equally in men and women under 30 years of age. It may be also associated with the residual cyst, radicular cyst, globulomaxillary cyst and primordial cyst, appearing as a slowly enlarging lesion causing cortical expansion.

Aspiration biopsy revealed straw colored fluid and shiny cholesterol crystals, suggestive of a radicular cyst or of an infected unicystic ameloblastoma; consequently, an incisional biopsy was taken, which revealed odontogenic epithelial lining composed of stratified squamous epithelium. The connective tissue capsule showed mild inflammatory cell infiltrate with numerous cholesterol clefts, suggestive of a radicular cyst.(Figure.4)

Following clinical, radiologic and histopathologic examination, the lesion was diagnosed as a radicular cyst, and a treatment plan was formulated. The involved tooth – from 34 was extracted under local anaesthesia. Under general anesthesia, in sterile conditions, an intraoral crevicular incision was taken from 33 to 35, with left and right releasing incisions posterior to 33and 35, respectively. The full thickness mucoperiosteal flap was raised, and anterior buccal corticotomy was carried out. Cystic legion was enucleated in toto. Peripheral ostectomy was carried out. A bismuth Iodoform paraffin paste (BIPP) pack was placed for dead space management.

Post-operatively, after 2 weeks, the BIPP pack was reduced in size weekly, along 4 weeks, and changed once thereafter, carrying out a similar procedure as above. Excisional biopsy has also confirmed the diagnosis of radicular cyst. New bone formation with reduction of radiolucency was noted beginning in the region of 33 and 35(Figure.5)

III. Discussion

Odontogenic cysts constitute frequent benign lesions of the jaw bones, due to the ubiquous presence of epithelial rests after odontogenesis [1]. Radicular cysts appear as the most common of all odontogenic cysts, with an incidence between 50 and 60%, as described by Tay (50.7%) [7], Ochsenius et al. (50.7%) [8], Shear et al. (52.3%) [9] etc., while Silvia et al. [10] found an incidence of 84.5%, and Sharifian et al. [11] reported an incidence of 37.9%. The pathogenesis of radicular cyst is commonly considered as occurring under three phases: initiation, cyst formation and enlargement [12]. The epithelial cell rests of Malassez in the periodontal ligament begin to proliferate by inflammation, as a result of the necrotic debris and bacterial antigens derived from the dead pulp. Meghji et al. [13], who studied cyst fluids and cultured cyst explants from radicular cysts, keratocysts and follicular cysts, showed high levels of endotoxins in radicular cysts, as compared to other cyst types. In the

second phase, the cyst cavity comes to be lined by the proliferating odontogenic epithelium. A widely accepted theory postulated that a cyst cavity is formed within a proliferating epithelial mass in an apical granuloma by degeneration and death of cells in the centre. Grupe et al. [14] demonstrated high levels of acid phosphatase activity in the central cells of apical granulomas, while Summers [15] found a weak proteolytic activity present centrally within the proliferating epithelium. Both studies suggest that these cells are undergoing autolysis. The third phase of growth and enlargement has been considerably researched over time. Toller suggested that the contents of cystic cavity are subjected to an osmotic imbalance with the surrounding tissues, because of the absence of lymphatic drainage, whereas Main felt that the radicular cyst fluid was essentially an inflammatory exudate. Skaug [16] also commented that the cyst walls have many layers of diverse functions: vascular endothelium, basement membranes, ground substance and cyst wall epithelium. Studies performed by Toller [17] and Skaug [18] also confirmed that intracystic pressure was inversely correlated to cyst size and concluded that increased pressure played a pivotal role in early cyst growth. Pulpal necrosis leading to inflammation appears as the most frequent etiology of the radicular cyst [2]. A lesser known but likely cause of pulpal necrosis reported in literature is traumatic injury to teeth. In our case, none of the associated teeth were found to be carious, while only one left mandibular first premolar was found to be non-vital but non-carious. Patient however did report blunt trauma to the chin about ten years ago. No injury or bleeding was reported and no treatment was taken at that time. Thus, significant trauma 10 years ago appears to have initiated the pathology. In the literature, most cases of radicular cyst have been described in the anterior maxilla. Some possible reasons reported are: the spongy nature of the maxillary bone and reluctance to extract anterior teeth, the over retention of which leads to cyst formation. This prevalence has been confirmed by many studies, including those of Ramchandra et al. [1], Silvia et al. [10], Sharifian [11]. Very few studies, like those of Meningrad et al. [19] and Koseglu et al. [20] contradict the above findings, sustaining that the mandibular radicular cyst is more common. Most of the cases of radicular cyst show a clear male predilection, which explains their increased tendency to trauma, the poor oral hygiene, caries and retention of carious teeth. Sharifian et al. [11] found that the radicular cyst is 1.3 times more frequent in men, while Silvia et al. [10] found about 2/3rd of the cysts in males. Generally, radicular cysts are small periapical lesions associated with one or more carious teeth, attaining 0.1 cm to 1 cm, even if a few long standing large radicular cysts larger than 5 cm have been reported [2]. This cyst is an unusually large mandibular cyst extending bilaterally from from 36 to 46, which is an extremely rare finding. Another striking feature is the absence of inferior alveolar nerve paraesthesia. During surgery, the inferior alveolar nerve was displaced along the inferior border of the mandible, which was carefully preserved.

IV. Conclusion

A radicular cyst is a common condition, and it usually goes unnoticed and rarely exceeds the palpable dimension. Untreated cases may lead to tissue destructions and facial deformity. Hence this case, occurs in retained root stump with clinical and histopathological findings similar to previous literature and was successfully treated by extraction of the offending tooth followed by surgical enucleation. The case report here presented has a classic presentation unknowingly diagnosed a mandibular radicular cyst, therefore, a significant documentation in literature.

Conflict of Interest
None

Source of funding
None

Figure.1: Profile View
Figure.2: Intra-Oral Examination
Figure.3: Pre-Operative Radiological View
Figure.4: Histopathological View(H & E staining) showing odontogenic stratified epithelium (a) and cholesterol clefts (b)
Figure.5: Post-Operative View (Follow up after 4 months)

References

[1]. Ramchandra P., Maligi P., Raghuveer H.P. A Cumulative analysis of odontogenic cysts from major dental institutions of Bangalore city: A study of 252 case. J. Oral Maxillofac Pathol 2011; 15:1-5.
[2]. Marx R.E., Stern D., editors. Oral And Maxillofacial Pathology: A rationale for Diagnosis and treatment. Illinois: Quintesssence Publishing Co. 2003.
[3]. Wood N.K., Goaz P.W., Jacobs M.C. Periapical Radiolucencies. In: Wood NK, Goaz PW, editors. "Differential diagnosis of Oral and Maxillofacial lesions", 5th ed. Mosby year book 1997; p. 257.

[4]. Kizil Z., Energin K.: An evaluation of radiographic and histopathological findings in periapical lesions, J Marmara Univ Dent Fac. 1990; 1:16-23.
[5]. Lalonde E.R.: A new rationale for the management of periapical granulomas and cysts: an evaluation of histopathological and radiographic findings, J Am Dent Assoc 1970; 80:1056-1059.
[6]. Shafer WG: Presentation to American College of Somatologic Surgeons Surgeons, Maywood, III, 1978.
[7]. Tay J.Y.Y., Bay B.H., Yeo J.F. et al. Identification of RANKL in osteolytic lesions of the facial skeleton. Journal of Dental Research 2004; 83, 349-353.
[8]. Ochsenius G., Escobar E., Godoy L., Penafiel C. Odontogenic cysts: analysis of 2944 cases in Chile. Med Oral Patol Oral Cir Bucal 2007; 12, E85-91.
[9]. Shear M. Clinical statistics of dental cysts. Journal of the Dental Association of South Africa 1961a; 16, 360-364.
[10]. Silvia T., Emanuele A., Maria F.M., Maria L.B., Francesco B., Francesco V. Prevelance and distribution of odontogenic cysts in Sicily: 1968-2005. J. Oral Science 2008; 50(1):15-18.
[11]. Sharifian M.J., Kalili M. Odontogenic cysts: A retrospective study of 1227 cases in an Iranian Population from 1987 to 2007. J. Oral Sci. 2011; 53(3):361-367.
[12]. Shear M., Speight P. Cysts of the oral and maxillofacial regions, 4th ed. Oxford: Blackwell Mungsgaaard. 2007.
[13]. Meghji S., Qureshi W., Henderson B. and Harris M. The role of endotoxin and cytokines in the pathogenesis of odontogenic cysts. Archives of Oral Biology 1996; 41, 523-531.
[14]. Grupe H.E. Jnr., Ten Cate A.R. and Zander H.A. A histochemical and radiobiological study of in vitro and in vivo human epithelial cell rest proliferation. Archives of Oral Biology 1967; 12, 1321-1329.
[15]. Summers L. (1974), The incidence of epithelium in periapical granulomas and the mechanism of cavitation in apical dental cysts in man. Archives of Oral Biology 19, 1177-1180.
[16]. Skaug N. Soluble proteins in fluid from non-keratinizing jaw cysts in man. International Journal of Oral Surgery 1977; 6, 107-121.
[17]. Toller P.A. Experimental investigations into factors concerning the growth of cysts of the jaws. Proceedings of the Royal Society of Medicine 1948; 41, 681-688.
[18]. Skaug N. Intracystic fluid pressure in nonkeratinizing jaw cysts. International Journal of Oral Surgery 1976a; 5, 59-65.
[19]. Meningaud J.P., Orpean N., Pitak-Arnop P., Bertrand J.C. Odontogenic cysts: A clinical study of 695 cases. J Oral Sci. 2006; 48, 59-62.
[20]. Koseglu B.G., Atalay B., Erdem M.A., Odontogenic cysts: A clinical study of 90 cases. J Oral Sci. 2004; 46:253-7.

Figures:

Figure.1

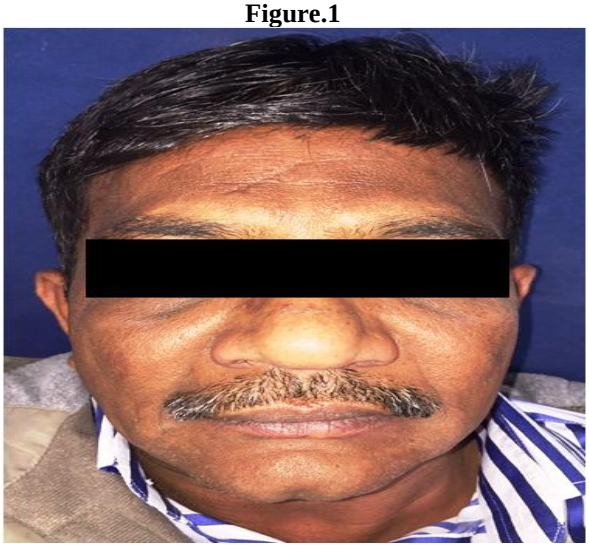


Figure.2

Figure.3.

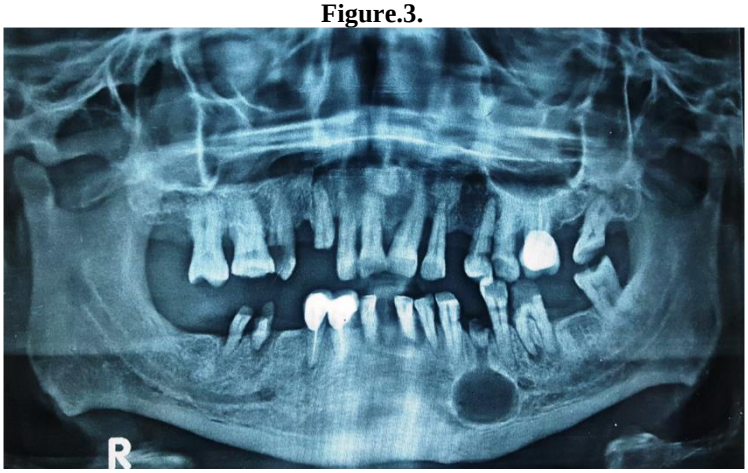
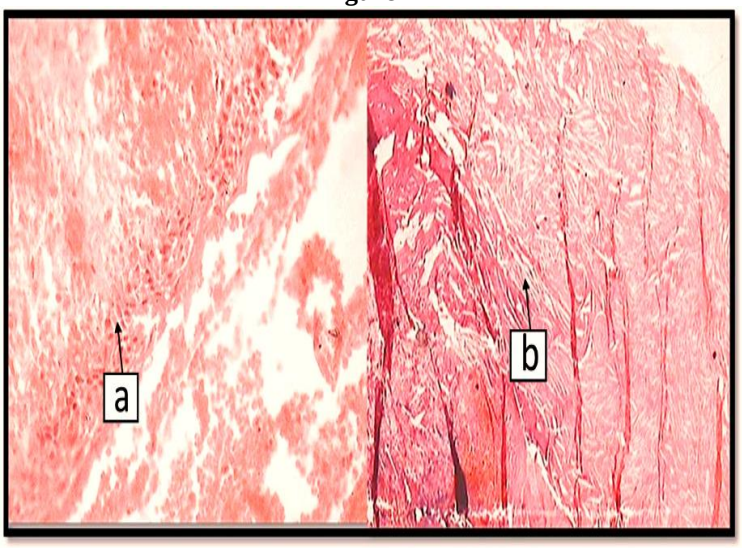


Figure 4



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