Odontogenic Keratocyst of Mandible Mimicking Radicular Cyst: A Case Report

Himani Sharma[1], Pranjelika Phukan[1], Shrutika Goel[2], Mohd. Sameer Khan[1], Anjali Singh[3]

[1]Department of Periodontology, School of Dental Sciences, Sharda University, Ruhallapur, Uttar Pradesh, India.
[2]Department of Conservative Dentistry and Endodontics, School of Dental Sciences, Sharda University, Ruhallapur, Uttar Pradesh, India.
[3]Department of Oral Pathology, School of Dental Sciences, Sharda University, Ruhallapur, Uttar Pradesh, India.

Abstract

An odontogenic keratocyst is a type of developing cyst. It originates from remnants of dental lamina. Philipsen coined the word for the 1st time in 1956. OKC was termed keratocystic odontogenic tumor in the WHO classifications of head and neck tumors in 2005 due to its aggressiveness, high recurrence rates, and distinct histological features, it was reclassified into the WHO classification of head-and-neck pathology (2017). They are distinct odontogenic lesions having the potential to be aggressive, recur, and be associated with nevoid basal cell carcinoma syndrome. This case report presents a case of 45-year-old male patient diagnosed with OKC located in the mandibular premolar region, along with a brief literature review of the clinical, radiological, and histopathological features of OKC.

Keywords: Guided tissue membrane, Jaw cysts, Mandible, Odontogenic keratocyst.

Introduction

An odontogenic keratocyst is a rare, benign, and locally aggressive epithelial developmental cyst. Because of its rapid growth, tendency for recurrence, and extension into adjacent tissues, it is a significant clinical entity.[1]

It occurs most commonly in the second and third decades of life, with a slight male predilection. OKCs are generally solitary lesions unless they are associated with nevoid basal cell carcinoma syndrome.[2]

They can occur anywhere in the jaws, although the majority of lesions occur in the mandible, most typically in the posterior body and ascending ramus.[2,3]

OKCs appear radiographically as well-defined radiolucent lesions with smooth and generally corticated edges. They can appear as a multilocular or unilocular radiolucent lesion.[4]

This case report presents a case of OKC, located in the mandibular premolar region, along with a brief literature review of the clinical, radiological, and histopathological features of OKC.

Case Description

A 45-year-male patient reported to the Department of Periodontology, School of Dental Sciences, Sharda University, Greater Noida with a complaint of food lodgement in the lower left back tooth region for 6 months. Upon clinical examination, class II dental caries was seen in 35 and 36 regions (Figure 1).

The patient was advised for intraoral periapical radiograph which revealed an oval-shaped radiolucency between the roots of 35 and 36 (Figure 2).

For precise diagnosis, CBCT was taken which showed a solitary, oval-shaped, well circumscribed homogenous radiolucency, of 11.5 × 10.8 × 6.4 mm (BL × SI × MD) dimension, extending to the apical third of the roots of 35 and 36 till the alveolar crest. Lining of the buccal and lingual cortical plate showed a loss of lamina dura with no evident perforation and expansion or root resorption at the site (Figure 3).

Based on the clinical and radiographic findings, a provisional diagnosis lateral periodontal cyst was given with a differential diagnosis of radicular cyst, odontogenic keratocyst.

Access this article online

Website: www.jrad.co.in

DOI: https://doi.org/10.53064/jrad.2022.14.5.376

Address for correspondence:
Himani Sharma, Department of Periodontology, School of Dental Sciences, Sharda University, Ruhallapur, Uttar Pradesh, India.
Email: syesh50@gmail.com

Received: May. 12, 2023; **Accepted:** Jun. 10, 2023; **Published:** Jun. 15, 2023

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to cite this article: Sharma H, Phukan P, Khan MS, Goel S, Singh A. Odontogenic Keratocyst of Mandible Mimicking Radicular Cyst: A Case Report. J Res Adv Dent 2023;14(5):1-4.



Figure 1: Pre-operative clinical picture

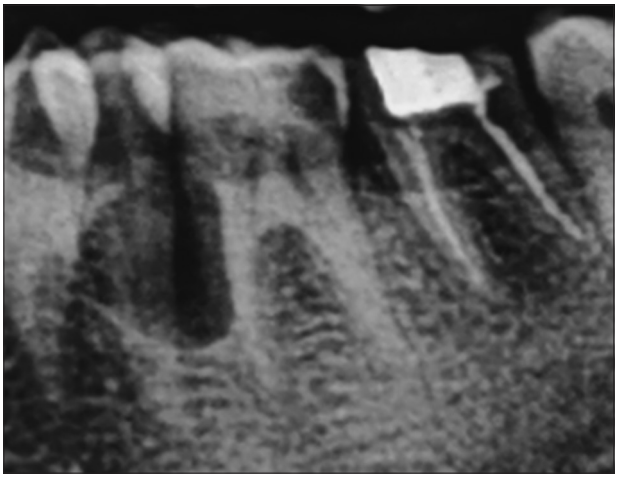


Figure 2: Pre-operative intraoral periapical radiograph

After phase 1, periodontal therapy was completed and the patient was referred to Department of Conservative and Endodontics for the root canal treatment of 35 and 36. After obturation of the aforementioned teeth, surgical enucleation of the cyst was planned and an informed consent was taken from the patient before the surgery.

Local anesthesia was administered and the full-thickness mucoperiosteal flap was elevated from 34 to 36 by giving sulcular incisions and vertical releasing incisions. Ostectomy was done to expose the cystic cavity. Then, the total enucleation of the cyst was done, followed by the placement of the resorbable collagen periodontal membrane (Impact GTR membrane,). Flaps were sutured with black silk non-absorbable sutures followed by the placement of a periodontal dressing. Antibiotics (Amoxicillin 500 mg, 3 times a day), analgesics (Zerodol-SP, 3 times a day) along with chlorhexidine mouthwash were prescribed to the patient for the next 3 days to prevent any post-operative complications. After enucleation, the excised tissues were sent for histological examination (Figures 4 and 5).

Histological examination revealed corrugated stratified squamous epithelium lining and underlying connective tissue

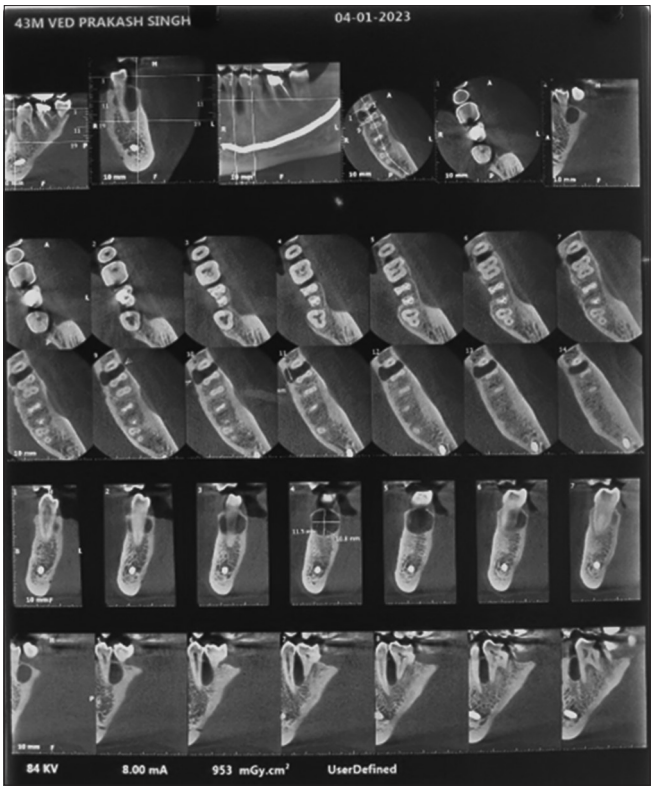


Figure 3: CBCT showing extent of the cyst

stroma. The epithelium is 4–6 cell layers thick with polarized nuclear of basal cells. The underlying connective tissue stroma shows dense collagen fibers interspersed and endothelial lined blood vessel. Hence, the diagnosis of odontogenic keratocyst was given (Figure 5).

The patient was recalled after 10 days for suture removal and re-evaluation. No post-operative complication was seen. The patient was followed up to 6 months and no recurrence was seen.

Discussion

OKC was classified as a tumor and named keratocystic odontogenic tumor (KCOT) in the 2005 World Health Organization Classification of Head-and-Neck Tumors. It has an aggressive behavior, the presence of a solid variant on occasion, its proclivity for high recurrence, and an associated protein-patched homolog 1 (PTCH) gene mutation.[5] However, the World Health Organization reclassified KCOT as a cyst in 2017 as research demonstrated that the PTCH cancer gene mutation may also be identified in non-neoplastic lesions such as the dentigerous cyst.[6]

The OKC is an odontogenic developing cyst that can originate anywhere in the jaws. Brannon (1976) and Myoung *et al*. (2001) found 65.4% of OKCs in the mandible, more common in the posterior molar and ramus of the mandible region than in the maxillary third molar region.[7] In our study also, the cyst was found in the mandibular posterior region.

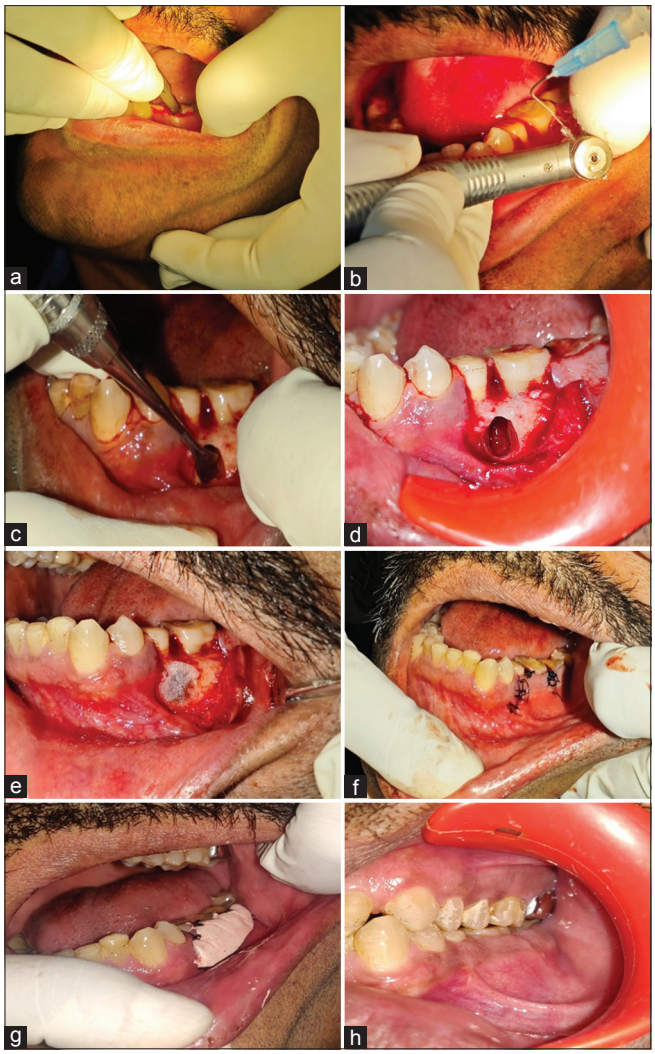


Figure 4: (a) Intrasulcular and vertical releasing incision given. (b) Ostectomy done to expose the cavity. (c) Enucleation. (d) After enucleation of the cyst. (e) GTR placed (f) Suture placed (g) Coe-pack placed. (h) Follow-up after 6 months

10% of cases have been identified inadvertently during routine radiographic examination, which was consistent with previous studies of Brannon (1976), Payne (1972) showing that OKCs enlarge in cancellous bone to a significant size before any significant buccal or lingual expansion appears to alert clinicians and patients of an underlying lesion. In our study too, the cyst was found accidently during the routine radiographic examination for dental caries.[2,7]

Radiographically, the cysts in our study presented as unilocular, which corresponds to the study done by Partridge and Towers (1987), in which 73.3% of the cysts were classified as unilocular. The unilocular to multilocular ratios in the maxilla and mandible were 6:1 and 1.9:1, respectively.[8]

Histologically, the lining epithelium in OKC is very thin, uniform in thickness with nearly complete absence of rete ridges. There is a well-defined basal and a thin spinous cell layer, which frequently exhibits a direct transition from the

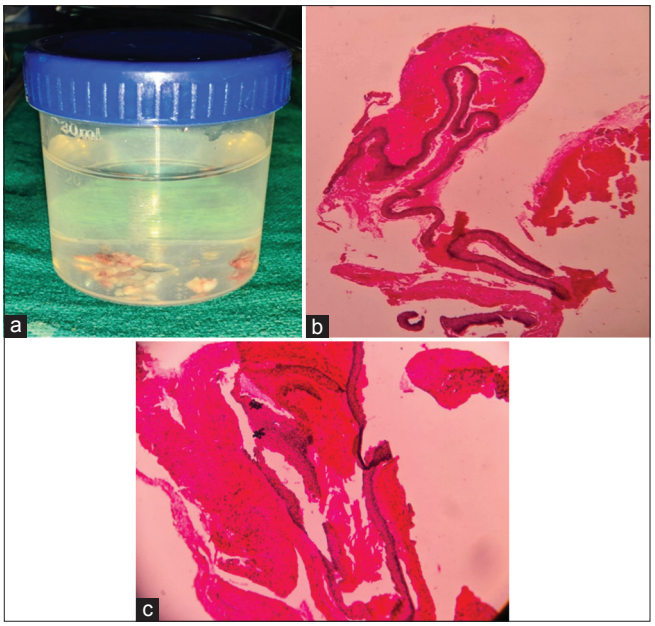


Figure 5: (a) Biopsy of the specimen was taken. (b and c) H- and E-stained section of the lesion

palisaded arrangement; the cells of the spinous cell layer frequently exhibit intracellular edema. Keratinization is mainly parakeratotic, but it can be orthokeratotic as well; the keratin layer is frequently corrugated, and the cyst wall is usually thin and non-inflamed. The orthokeratinized variant has a limited growth potential, a low recurrence rate, and has no association with Gorlin syndrome; hence, it should be subsequently differentiated from the parakeratinized variant.[9-11]

Enucleation, excision of overlying mucosa followed by the application of Carnoy's solution, marsupialization/decompression followed by cystectomy, and mandibular resection are recommended treatment modalities for OKC that are known to reduce/prevent recurrence.[12-14] However, in our study, we performed complete enucleation of the cyst followed by the placement of GTR membrane to prevent epithelial migration into the cystic cavity.

Conclusion

OKC is a unique odontogenic cyst with aggressive clinical behavior and a high recurrence rate. Proper diagnosis and complete surgical removal and long-term follow-up are crucial for the successful management of this lesion.

References

1. MacDonald-Jankowski DS. Keratocystic odontogenic tumour: Systematic review. Dentomaxillofac Radiol 2011;40:1-23.
2. Payne TF. An analysis of the clinical and histopathologic parameters of the odontogenic keratocyst. Oral Surg Oral Med Oral Pathol 1972;33:538-46.
3. Gustafson G, Lindahl B, Dahl E, Svensson A. The nevoid basal cell carcinoma syndrome--Gorlin's syndrome. Multiple jaw cysts and skin cancer. Swed Dent J 1989;13:131-9.
4. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial

Pathology. 2nd ed. St. Louis: Saunders; 2002.
5. Wright JM, Odell EW, Speight PM, Takata T. Odontogenic tumors, WHO 2005: Where do we go from here? Head Neck Pathol 2014;8:373-82.
6. Soluk-Tekkeşin M, Wright JM. The world health organization classification of odontogenic lesions: A summary of the changes of the 2017 (4th) edition. Turk Patoloji Derg 2018;34:1-8.
7. Brannon RB. The odontogenic keratocyst: A clinicopathologic study of 312 cases. Part I. Clinical features. Oral Surg Oral Med Oral Pathol 1976;42:54-72.
8. Partridge M, Towers JF. The primordial cyst (odontogenic keratocyst): Its tumour-like characteristics and behaviour. Br J Oral Maxillofac Surg 1987;25:271-9.
9. Ohki K, Kumamoto H, Ichinohasama R, Sato T, Takahashi N, Ooya K. PTC gene mutations and expression of SHH, PTC, SMO, and GLI-1 in odontogenic keratocysts. Int J Oral Maxillofac Surg 2004;33:584-92.
10. Morgan TA, Burton CC, Qian F. A retrospective review of treatment of the odontogenic keratocyst. J Oral Maxillofac Surg 2005;63:635-9.
11. Chi AC, Owings JR Jr., Muller S. Peripheral odontogenic keratocyst: Report of two cases and review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005;99:71-8.
12. Madras J, Lapointe H. Keratocystic odontogenic tumour: Reclassification of the odontogenic keratocyst from cyst to tumour. J Can Dent Assoc 2008;74:165h.
13. Sharif FN, Oliver R, Sweet C, Sharif MO. Interventions for the treatment of keratocystic odontogenic tumours. Cochrane Database Syst Rev 2015;2016:CD008464.
14. Odell EW, Cawson RA. Cawson's Essentials of Oral Pathology and Oral Medicine. 9th ed. Edinburgh: Churchill Livingstone; 2017.