

Keratocystic tumor in mandibular body region

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Abstract

Odontogenic keratocyst (OKC) are developmental, non-inflammatory, chronic odontogenic cysts of epithelial origin derived from remnants of the dental lamina with a biologic behavior similar to that of benign neoplasm. The diagnostic approach is based on a combined analysis of the medical history, the clinical features, and the radiographic appearance. The diagnosis may be confirmed by the histopathology report. Finally, treatment consist of surgical excision and follow-up is characterized by a high rate of recurrence. The authors report a case of Keratocystic odontogenic tumor in a 27-year-old male patient in the left mandibular body region, and review the various diagnoses, therapeutics and follow up aspects of this aggressive tumor.

Keywords: Keratocystic Odontogenic Tumor, OKC, Aggressive, Enucleation, Marsupialization, Recurrence.

Introduction

The odontogenic keratocyst (OKC) was first described in 1876⁽¹⁾ and named by Philipsen in 1956.⁽²⁾ OKC is known for its aggressive behavior and its tendency to invade the adjacent structures including bone.^(1,2) The designation “keratocyst” was used to describe any jaw cyst in which keratin was formed to a large extent.⁽³⁾ It has high recurrence rate and is associated with basal cell nevus syndrome.⁽⁴⁾ However, in 2005 the world health organization (WHO) reclassified odontogenic keratocyst as “keratocystic odontogenic tumor” and histologically named it benign odontogenic tumor.⁽⁵⁾ They occur with a peak incidence in the second and third decades, with slight male predominance. The mandible is affected more frequently than maxilla, majority of cysts occur in the ramus-molar area, followed by the first and second molar area and then anterior mandible.⁽³⁾

OKC has its propensity to grow within the medullary cavity anteroposteriorly with minimal bone expansion and displace teeth more frequently than resorption.⁽⁶⁾ The radiographic appearance of OKC may resemble dentigerous cyst, lateral periodontal cyst, ameloblastoma and radicular cyst.⁽⁷⁾ Histopathologically the lining epithelium is thin ortho keratinized or corrugated para keratinized, 6-10 cell thick, palisaded, polarized basal cell layer without rete pegs, lumen containing desquamated keratin and fibrous capsule. The stratified squamous epithelium of cyst produces parakeratin in 83% cases, ortho keratin in 10% or both types in 7% cases.⁽³⁾ The relatively slight expansion common with these lesions probably contributes to their late detection, allowing them to reach a large size.⁽⁶⁾

Case Report

A 27 years old male patient presented with a chief complaint of swelling in the left lower jaw region since seven months. History of present illness revealed that the

swelling was initially small and gradually increased in size. Extra-oral examination revealed a swelling of 4x5 cm which extends from the left mandibular body region up to the para symphyseal region of the same side. Intraorally, the overlying mucosa of the swelling appears smooth along with buccal vestibular obliteration. On palpation, swelling was firm, non-tender, nodular with foci of cortical erosion. Panoramic view (Fig. 1) revealed a unilocular radiolucency of 4x5 cm in the left mandibular body region. The borders of the radiolucency appear smooth extending from the root of lateral incisor till the distal root of the second molar.



Fig. 1: Preoperative OPG

Table 1

Tooth Number	Vitality Test Values
33	21
34	24
35	25
36	06
37	04
43	06
44	10

45	10
46	03
47	08

Pulp vitality test showed that the involved teeth 33, 34, 35 are non-vital except 36 which was found vital.

Fine needle aspiration cytology revealed blood tinged straw colored fluid.(Fig. 2)



Fig. 2: Aspiration Cytology

To confirm the diagnosis, an incisional biopsy(Fig. 3) was taken, under 2% lidocaine containing 80,000 epinephrine by removing the buccal cortical plate, the cystic lining was seen along with yellowish cheesy material filling the entire cavity. The lining was then sent for histopathological examination, and a cavity was left after incisional biopsy.(Fig. 4)



Fig. 3: Incisional biopsy



Fig. 4: Cavity after incisional biopsy

Diagnosis of KCOT was confirmed by the histopathological report (Fig. 5). Epithelium was of a stratified squamous para keratinized type and 6-8 cell layered thick. Surface epithelium was corrugated, and basal cells were columnar to cuboidal in shape showing hyperchromatism. Underlying connective tissue was collagenous in nature.

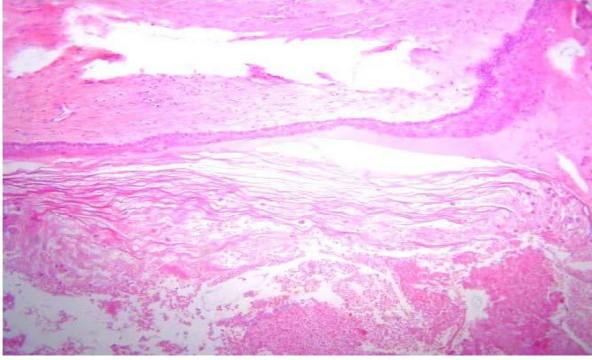


Fig. 5: Histopathological Section

Surgical procedure



Fig. 6: Exposing cystic defect



Fig. 7: Cystic cavity after enucleation

After the confirmation of KCOT, the definitive plan for the management was made which included RCT of non-vital teeth followed by complete enucleation of cystic lining along with apicectomy of involved teeth, followed by application of Carnoy's solution in the entire cystic cavity. The patient was prescribed antibiotics and analgesics for next five days. The patient was advised to maintain good oral hygiene and mouthwash was prescribed. Surgical procedure involved, crevicular incision starting from midline and extending up to the distal surface of the second molar, with the anterior releasing incision. After elevating the mucoperiosteal flap, the bony defect was slightly widened(Fig. 6) The

cystic lining was completely enucleated, defect rinsed with saline and povidone-iodine solution and a sterile gauze swab presoaked with Carnoy's solution was placed in the cystic defect and left there for 3 minutes. Then, the cavity was re-rinsed with saline to enable sight of the cystic wall remains, which were dark brown colored and fixated, enabling their complete removal(Fig. 7) After thorough rinsing with saline and povidone-iodine solution, the defect was packed with the iodoform gauze, and the wound was closed. The iodoform gauze packing was completely removed on the 7th postoperative day, and the sutures were removed(Fig. 8) At present, the patient is on a regular follow-up examination, and iodoform pack is changed weekly. Two months post-surgery, the overlying soft tissue was healthy in appearance(Fig. 9). As 36 was well into the cystic cavity, in spite of being vital (on pulp vitality test), it was decided to get its RCT done.



Fig. 8: Postoperative OPG (1-week post op)



Fig. 9: Postoperative OPG(4 weeks post op)

Discussion

Unlike most cysts which are thought to grow solely by osmotic pressure, the epithelium in OKC is thin, the high mitotic index showing innate growth potential consistent with a benign tumor. The connective tissue shows small islands termed as daughter cysts which

represent the ends of folds of the lining epithelium of the main cystic cavity.⁽³⁾

Since the lesion has a very high recurrence rate, various treatment modalities are used on the basis of size, location, proximity to vital structures and perforation of cortical plates but enucleation and packing is by far the most preferred method when the patient is young and has no cortical perforation.⁽⁸⁾ Morgan et al., categorize treatment methods for KCOT as conservative or aggressive, both being forms of surgical intervention. As a result of the difficulty of enucleating the thin, friable wall of the KCOT as one piece and due to small daughter cyst treatment should aim to eliminate the possible vital cell. Microcysts and epithelial islands were always seen in the overlying mucosa. Therefore, excision of the mucosa overlying the lesion has been recommended.⁽¹⁰⁾ Carnoy's solution did not show significance recurrence rate yet decreased recurrence rate following treatment with enucleation and Carnoy solution (2.5%) compared with enucleation alone (13.5%) reported by Varsoomi et al. The effects of Carnoy's solution on the inferior alveolar nerve were first reported by French et al. (1994). No axonal damage was observed. In contrast, another study noted the alterations in neural conductivity after 2 min of direct application with recovery after two weeks reported by Wolden et al.⁽⁹⁾

In our case patient was having foci of cortical perforation has undergone aggressive treatment including enucleation with peripheral osteotomy using Carnoy's solution.

Conclusion

The aggressive nature of OKC warrants an aggressive treatment strategy and its recent reclassification by WHO as a neoplasm should further motivate clinicians in this direction. Resection of the jaw results in the lowest recurrence rate. However, considering the radical nature of the procedure, unless resection is necessary, it is acceptable to use enucleation in combination with Carnoy's solution or marsupialization.

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