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CASE REPORT

Keratocystic odontogenic tumor and its radiological diagnosis by 3 dimensional Cone Beam Computed Tomography (CBCT).

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ABSTRACT

Keratocystic odontogenic tumor is a special type of odontogenic cyst. Frequent recurrence after surgical removal, world health organization termed it as a tumor instead of cyst. It is a real challenge for oral and maxillofacial surgeon to deal with this tumor. To manage this tumor, a detailed radiological diagnosis may be of a great help to prevent recurrence. In this presented case, we used Cone beam computed tomography to find out the margin of the extension of cortical perforation diameter of the lesion and type of bone destruction.

Introduction

Keratocystic odontogenic tumor (KCOT) is a benign neoplasm that has keratinized epithelial lining and a very high recurrence rate1. It develops from cells originating from the dental lamina, basal cells of oral epithelium or from the stellate reticiulum of the enamel organ1. The method of enlargement is thought to be mostly by proliferation of the lining. The osmotic pressure is less of a factor for enlargement than in the case of other dental cysts.

This mechanism of growth has led to evolving keratocystic odontogenic tumor from the cystic category (known as Odontogenic Keratocyst) to the benign tumors category under the name KCOT2.

Cone beam computed tomography (CBCT) is a medical imaging technique that has become increasingly popular in treatment planning and diagnosing in oral and maxillofacial diseases[3]. During a CBCT scan, the scanner rotates around the patient's head, obtaining up to nearly 600

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distinct images. The scanning software collects the data and reconstructs it, producing what is termed as a digital volume composed of three dimensional voxels of anatomical data that can then be manipulated and visualized with specialized software[4].

Case report

18 years old boy was admitted to update dental college hospital with complain of Pain and swelling of right lower jaw for the last six (6) months. On examination, hard swelling on the right jaw found expanded buccally and displacement of teeth in right side of mandible. Clinically, mandibular right 1st molar was missing. Cervical group of lymph nodes were not palpable. The patient was advised for a panoramic radiograph for radiological investigation.

Fig. 1: Panoramic radiography shows the lesion.

Panoramic radiograph (Fig-1) showed a radiolucent lesion extending posteriorly from mandibular right 2nd molar to left lateral incisor anteriorly. Right mandibular 1st molar was shown impacted in the panoramic radiograph. Radiolucent lesion suppressed the inferior alveolar canal more inferiorly. Teeth displacement was noted. However, in this panoramic radiograph, it is very difficult to clarify about the bucco - lingual expansion, position of right mandibular 1st molar or presence of any perforation on buccal or lingual cortical plate. For the confirmative diagnosis, we chose more advanced imaging technology named cone beam computed tomography scan which could give us three dimensional images.

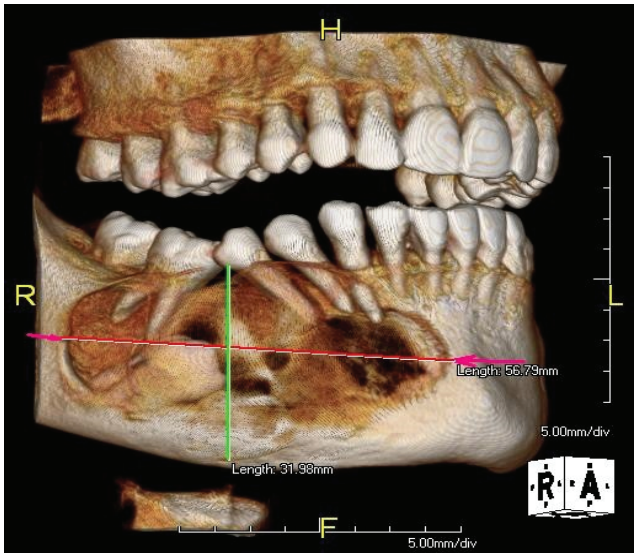

Fig. 2 : Cone beam computed tomography

Usually, Cone beam computed tomography (Fig. 2) shows a three dimensional image of both jaws. The image showed a multilocular hollow cavity on right side of the mandible. The cavity extended antero-posteriorly around 56.79 mm, and supero-inferiorly around 31.98 mm. Impacted mandibular 1st molar situated along the lower border and crown placed more lingually (Fig. 3). Teeth displacements were noted more clearly.

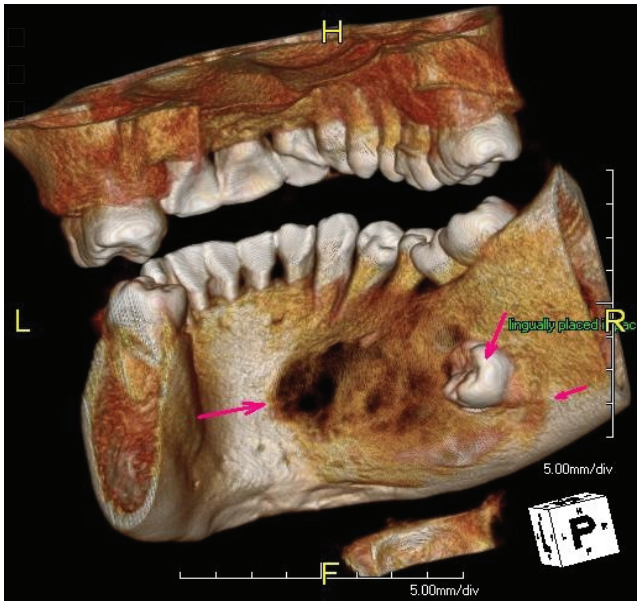

Fig. 3 : Cone beam computed tomography Lingual view.

In lingual view (Fig. 3), bone resorption was noted less than buccal cortical plate. Evidence of lingual cortical perforation by the right impacted mandibular Ist molar was also noted.

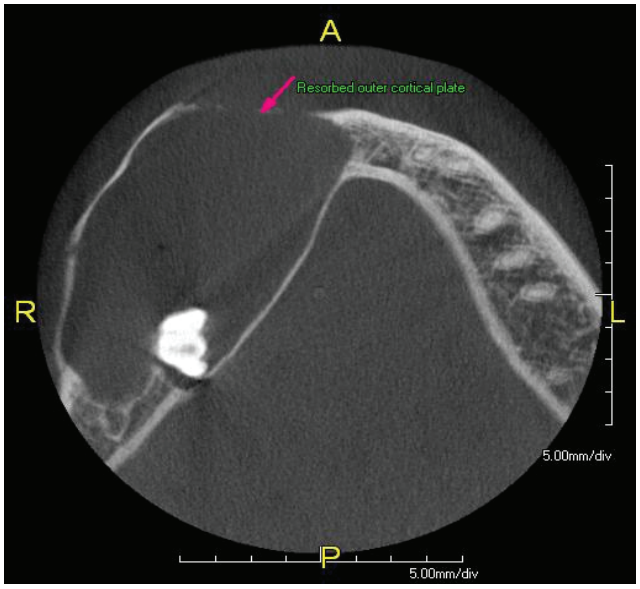

Fig. 4 (a): Axial tomographic view at different section level

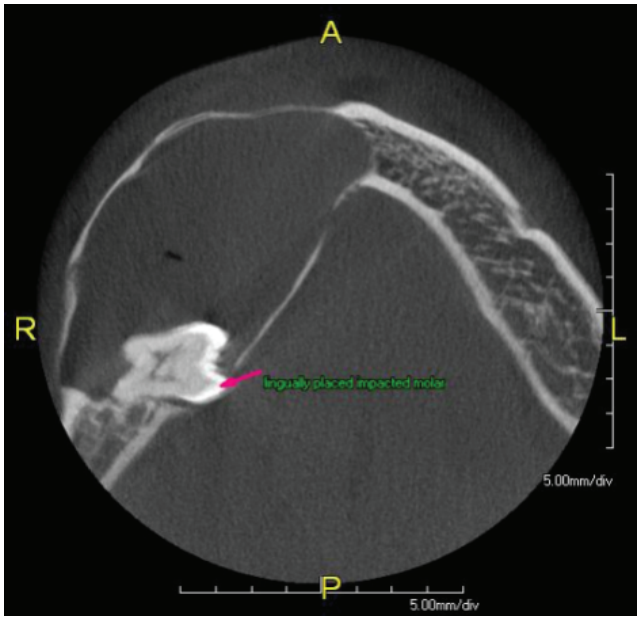

Fig. 4 (b): Axial tomographic view at different section level

In axial tomographic view 1st image (Fig.4. a) showed both buccal and lingual cortical perforation. In 2nd image (Fig.4. b) lingual cortical perforation was observed by mandibular 1st molar tooth.

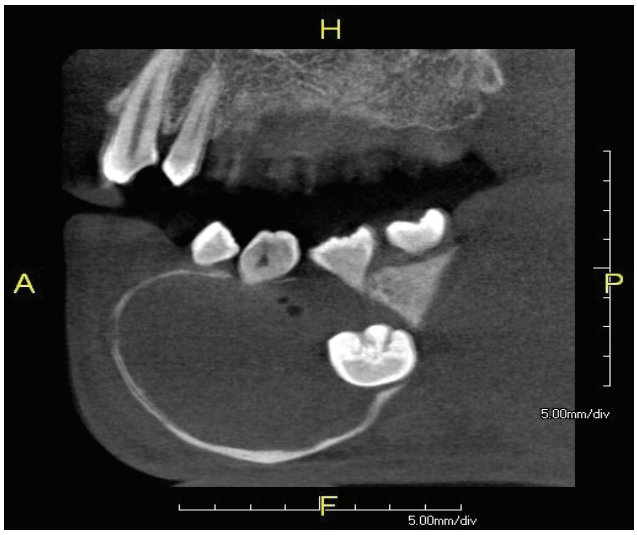

Fig. 5 (a) :- Sagittal image

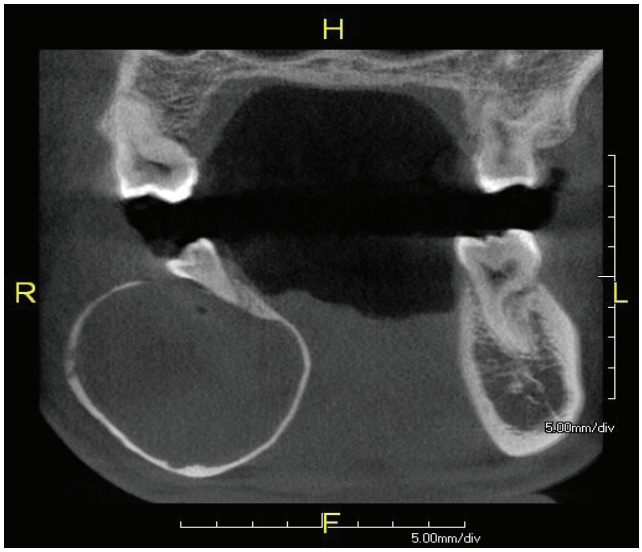

Fig. 5 (b) :- Coronal image

Sagittal and coronal image (Fig. 5a & 5b) shows a balloon like expansion, which indicated the lesion may be a cyst.

For further confirmation, incisional biopsy was performed. Biopsy reveled odontogenic keratocyst, and cyst wall lined by orthokeratinized stratified squamous epithelium.

On the basis of Radiological and histopathological diagnosis, the cyst was surgically treated by enucleation with removal of involving teeth. Patient was advised for long term followup and referred to prosthodontist for prosthetic replacement of teeth. Excisional biopsy revealed same result as preoperative histopathological examination.

Discussion

KCOT usually observed occur in a wide range of ages and have peak incidence between the second and third decade of life. The male to female ratio is 1.3:15. The mandible is affected twice as much as the maxilla and most commonly found in the mandibular third molars and ramus areas[3]. KCOT can form around unerupted tooth. It has a great potential for recurrence due to the existence of small satellite cysts or fragments left after surgical removal[3]. KCOT, that is associated with crown on unerupted tooth may be indistinguishable from a dentigerous cyst. If it is connected apical to the cementoenamel junction or if there is no expansion then it is more likely to be a KCOT[1]. KCOT can resemble an odontogenic myxoma when it is multilocular and has mild expansion1. Although simple bone cyst has scalloped margins and minimal expansion which can resemble KCOT; however, a simple bone cyst margins are harder to detect. When multiple KCOT are detected, it is likely to be associated with basal cell nevus syndrome[3].

Since KCOT has a great potential to recur, a Cone Beam CT examination can best detect the extensions of the margins, thus referral to a radiologist for complete radiographic examination is recommended. Multi-scanner computed tomography is also a useful tool for radiological investigation, however, it liberates more radiation than cone beam computed tomography[6]. In multi-scanner computed tomography we can measure CT value, which is quite impossible with cone beam computed tomography. Metal artifacts are more likely to be seen in multi-scanner computed tomography than cone beam computed tomography[6].

Surgical treatment can include resection, curettage, and marsupialization to reduce size of the lesion[3]. Periodic follow-up every 6 months is recommended to monitor the patient for any signs of recurrence which can develop within the first 5 years or delayed to 10 years[1].

Complete removal of the walls of KCOT is important due to its high recurrence rate. To diagnose the accurate extension of KCOT, Cone Beam CT (CBCT) can be a very useful diagnostic aid. CBCT helps us to surgically remove KCOT more accurately and thus helps to reduce its recurrence rate.

References

1. A. Chkoura, S. Chbicheb, W. El wady: Keratocystic Odontogenic Tumor: A Case Report And Review Of The Literature. The Internet Journal of Dental Science. 2009 Volume 6 Number 2
2. Reichart P A, Philipsen H P, Sciubba J J. The new classification of Head and Neck Tumours (WHO) - any changes. Oral Oncol 2006; 42: 757-758.
3. De Vos, W; et al. Cone-beam computerized tomography (CBCT) imaging of the oral and maxillofacial region: A systematic review of the literature. Int J Oral Maxillofac Surg 2009;38:609-625.
4. Hatcher, DC. Operational principles for cone-beam computed tomography. JADA 2010;141(10S):3S-6S
5. El-Hajj G, Anneroth G. Odontogenic keratocysts - a retrospective clinical and histologic study. Int J Oral Maxillofac Surg 1996; 25: 124-129.
6. Myoung H, Hong S P, Hong S-D et al. Odontogenic keratocyst : Review of 256 cases for recurrence and clinicopathologic parameters. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001; 91 : 328- 33.