CBCT- a Boon in the Treatment of Impacted Maxillary Canine in Close Approximation to Maxillary Sinus

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Abstract

An impacted tooth is the one that has failed to erupt into the oral cavity within the expected time, hence has to be surgically extracted or exposed. This article presents a case of deeply impacted maxillary left canine in a 21 yr old female which was difficult to remove as it was in close approximation to maxillary sinus and nasal cavity. CBCT proved to be very beneficial in determination of exact positioning of impacted canine by which an extensive surgical procedure was avoided

Keywords: CBCT (Cone-Beam Computed Tomography), Deeply Impacted Maxillary Canine, Maxillary Sinus.

Introduction

An impacted tooth is the one that is prevented by the soft and hard tissues to erupt into the oral cavity, beyond the chronological age with completed root formation.[1] Canines are known as Corner stones as these are the longest teeth located at the corner of mouth. These are frequently found to be impacted after 3rd molars. Permanent maxillary canines develop late deep within maxilla hence gets mostly effected with eruption disturbances.[2] Various etiology for impaction canine includes presence of supernumerary, delayed exfoliation of deciduous canines, ankylosis, trauma to maxilla, pathologies etc. Different radiographic techniques can be used to determine the presence and location of impacted canine but CBCT is considered superior to the conventional methods [3]

Case Report

A 21 year old female reported to the department of Oral and Maxillofacial Surgery with the chief complaint of pain in upper left anterior region of jaw since 2-3 months. On clinical examination missing 23 and over-retained 63 was seen. Patient was advised OPG which showed impacted 23 in close approximation with maxillary sinus (Fig1a). For better visualization, CBCT was advised. On CBCT, the position was clear, mesioangular impaction with 23 was seen. Crown of 23lies in the periapical region of 21. The crown was causing thinning of buccal and palatal cortical plates. The root was wedged between lateral wall of nasal cavity and anterior wall of maxillary sinus,(Fig1b) as stated on CBCT report. The case was planned under local anaesthesia and under all aseptic precaution Crevicular incision was made from 21 to mesial aspect of 24 followed by a releasing incision mesial to 24 (fig2a). A full thickness mucoperiosteal flap was raised. According to the position evaluated through CBCT, buccal cortical plate was trimmed and the canine was exposed (fig2b). As the canine was deeply impacted, it was sectioned and removed. Irrigation followed by closure with 3-0 silk suture was done.(3a) There was no

damage to the sinus lining and nasal floor during the procedure.

Patient was recalled after 24 hrs for follow up and after 7 days for the removal of suture. Satisfactory healing was seen.
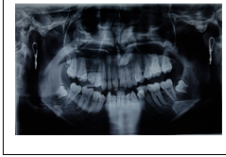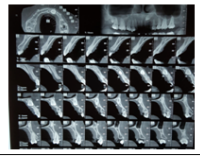

Fig:1a: Preoperative- OPG

Fig:1b: Preoperative- CBCT

Fig: 2a: Incision.

Fig: 2b: Exposure of impacted canine.

Fig: 3a: Closure.

Fig: 3b: Surgically extracted canine.

Discussion

Most common impacted teeth after 3rd molars is canines. It is seen that canines have the longest path of eruption as compared to the other teeth. Incidence of impaction of canines shows slight female predilection, and is more common in maxilla (0.8 to 2.8%) than mandible (0.2%) and is usually unilateral than bilateral affecting left side more common than right. [4] In this case it was maxillary left canine. Removing a deeply impacted canine has always been a challenge. Proper clinical and radio graphical investigation is essential. Visual inspection for buccal or palatal bulge and proper radiographic evaluation for position of canine is important. Commonly used radiographic methods for determination of impacted canine include Panaromic, periapical, cephalometric, maxillary occlusal view etc., but CBCT is most preferred and precise method as it has maximum diagnostic yield, proper evaluation of impacted canine and its association with adjacent structures can be made, reduces patient's exposure and allows minimal invasive surgery.[5] In this case CBCT proved very beneficial as the canine was deeply impacted and the root was intercalated between lateral wall of nasal cavity and anterior wall of maxillary sinus, so the risk of penetration and damage to sinus or nasal floor was high. Thus the anatomical basis provided by CBCT was very helpful in preoperative planning.

Role of CBCT in determining the impacted Canine

CBCT (Cone- Beam Computed Tomography) is a 3-D investigation radiographic method developed in 1990 is a low dose volumetric CT system which is cost effective and enables clinician take advantage of 3d information provided by low dose of radiation. With a single exposure of about 18 seconds, it provides with detailed 3D imaging thus gives reliable data on the management of impacted canine[6] The limitations of conventional 2D imaging such as image distortion, image enlargement, structural overlap, and limitation in identifying landmarks can be overcome by using CBCT.[7]

As reported by a study 3D imaging of impacted canine using CBCT can accurately determine the exact position, inclination of long axis of teeth, relative buccal/ palatal position, anatomical bone structure, 3D proximity with surrounding structure and adjacent teeth and also the overall stage of dental development. Thus CBCT is a reliable method for assessment of impacted tooth and helps in proper surgical management. [8]

Conclusion

A detailed information about the position of impacted tooth and its association with adjacent structure is very important for preoperative planning. CBCT is the most reliable method for assessment to position of impacted tooth. The healing was satisfactory in this case.

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