



SIMPLIFIED SURGICAL EXTRACTION PLANNING USING CONE BEAM COMPUTED TOMOGRAPHY

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Case presentation:

A 43 years old woman was complained of facial pain and headache, with no signs of any disorders. On panoramic radiograph, both third molars were impacted with a connection to the root of second molar and maxillary sinus (Fig. 1). CBCT scans were performed to evaluate the position and direction of the impacted teeth in the maxillary sinus and related tooth. Both coronal and sagittal images showed the close proximity to the root of left second molar and right maxillary sinus. Under sedation, Caldwell-Luc procedure was performed for the removal of the right upper wisdom tooth, while a standard third molar surgery was made for the other. The right wisdom tooth between sinus mucosa and alveolar bone was carefully removed without mucosal perforation of the sinus (Fig. 5). Postoperative period was uneventful and no complaints at 2 years follow-up (Fig. 6).

Background:

An impacted tooth is one which fails to erupt within the dental arch in the expected time and away from their anatomic position. Treatment decision depends on several factors: location of the impaction, prognosis of the intervention on the impacted tooth and adjacent teeth, surgical accessibility, impact of treatment on the final functional occlusion, and possible surgical morbidity. This decision has traditionally been based on planar 2-dimensional (2D) radiography. New imaging techniques like cone-beam computed tomography (CBCT), which has a lower-dose and lower-cost alternative to conventional CT can direct us in a proper planning and make it easier.

CBCT is a valuable imaging technique in oral and maxillofacial surgery (OMS) that can help direct a surgeon's approach to a variety of conditions. A 3-dimensional analysis of head and neck anatomy allows practitioners to plan appropriately, operate with confidence, and assess result post-operatively. It offers 3-dimensional and multi-planar views for a more accurate diagnosis and treatment without the financial burden and radiation exposure of conventional computed tomography (CT) scans. Furthermore, CBCT overcomes certain limitations of 2-dimensional imaging, such as distortion, magnification and superimposition. In the present case, both impacted third molar with a connection to the root of second molar and maxillary sinus were not clearly demonstrated on panoramic radiography. The best images demonstrating the bone and/or mucosa of maxillary sinus were taken on frontal view of 3D CBCT.



Figure 1. Panoramic view of bilaterally impacted maxillary third molar

Figure 2. 3D CBCT image shows the close proximity to the root of the left second molar and proximity to the right maxillary sinus; the root of the left second molar is placed in the middle of occlusal surface of the impacted tooth

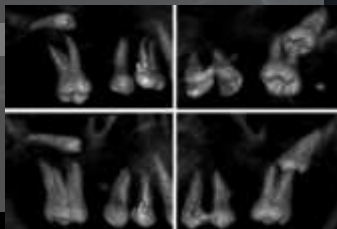


Figure 3. On the frontal view of 3D volumetric image, while the right tooth, without bony coverage, was in the maxillary sinus, the crown of the left impacted tooth was fully covered with bone

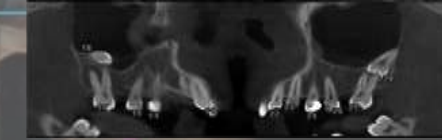


Figure 4. The sagittal view of the right (a) and lateral view of the left (b) impacted maxillary teeth



Figure 5. The impacted tooth (white arrow) was seen under the sinus mucosa (black arrow)



Conclusion:

3D computed tomographic model provide valuable information for improved diagnosis and treatment plan and ultimately results in more successful treatment, as in present case. The surgeon, knowing the precise location of the tooth and shape of the roots in all projections would reduce the invasiveness of surgery.

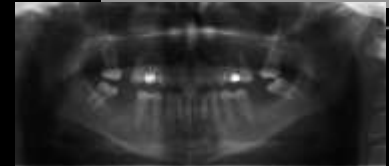


Figure 6. Final panoramic view of patient

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