

**DIAGNOSIS AND LOCALIZATION OF THE MAXILLARY IMPACTED
CANINE BY USING DENTAL MULTI-SLICE COMPUTED
TOMOGRAPHY 3D VIEW AND RECONSTRUCTED PANORAMIC 2D
VIEW**

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By
Nadia Bassim Al-Ansari
B.D.S.

Supervised by
Professor Dr. Nidhal H. Ghaib
B.D.S., M.Sc. (ortho)

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Abstract

Diagnosis and treatment planning can be difficult with conventional radiographic methods as the orthodontic-surgical management of impacted canines requires accurate diagnosis and precise localization of the impacted canine and the surrounding structures. It is important to define the exact position relative to the neighboring structures and the inclination of the longitudinal axis of the impacted tooth. Several authors have used, computed tomography (CT), particularly spiral CT for localization of the canine impaction and for evaluation of incisors resorption, because it can provide more reliable information than conventional methods, as it provides excellent tissue contrast, eliminating blurring and overlapping of adjacent teeth.

The present study was carried out to investigate with dental multi-slice computed tomography using three dimensional volumetric images and two dimensional CT derived panoramic images the location of the impacted maxillary canines, the contact; overlapping; and resorption severity of the neighboring incisors, and to compare and evaluate whether there is any differences in the diagnostic information provided by both imaging modalities.

Unilaterally and bilaterally impacted maxillary canines from 30 patients (24 female, 6 male) were evaluated on images taken with Brilliance™ 64, Philips multi-detector computed tomography. The spatial relationships of the impacted maxillary canines relative to the adjacent structures was evaluated using linear and angular measurements, and the adjacent lateral incisor root resorption was assessed with three dimensional and two dimensional visualization software.

The result of the present study revealed that the inclination of the impacted maxillary canine measured to the midline and to the occlusal plane did not differ significantly when it was evaluated using the two imaging modalities, as the percentage of agreement between the 3D CT and the 2D panorama was 55.55%.

However, there was significant differences between the 3D and 2D images with respect to the mesiodistal width of the impacted canine crown, in the impacted canine vertical height, and in the bucco-palatal impacted maxillary canine localization as the percentage of agreement between the 2D and the 3D was 19.44%.

Furthermore, the presence of canine incisor overlap and root resorption of the lateral incisor was also significantly different between both imaging modalities and the percentage of agreement of the overlap and resorption between them was 33.33%, 47,22% respectively.

Lastly, In the current study a marked females prevalence in the canine impaction than males was observed. Also, canine impaction problems were more common unilaterally than bilaterally, and the left side was more prevalent than the right side.

In conclusion, the increased precision in the localization of the impacted canines and the improved estimation of the root overlapping and resorption obtained with the spiral three dimensional CT resulted in a difference in the diagnosis and treatment planning towards a more clinically oriented approach.