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Radiographic assessment of Maxillary posterior teeth roots in relation to Maxillary sinus and adjacent cortical plates using Cone Beam Computed Tomography

A thesis

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by

Ali Hakiem Tawfieq

B.D.S.

Supervised by

Assistant Prof. Dr. Ahlam Ahmed Fatah

M.Sc. Oral Radiology

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Abstract

Background:

Evaluation and detection of the anatomical relation between the roots of the maxillary posterior teeth and the floor of maxillary sinus is essential before planning any surgical procedure also the anatomical relation between roots and the cortical plates is essential which result in spread of odontogenic infection. The craniofacial area can be properly imaged by using cone beam computed tomography,it offers perfect images of extremely contrasted structures and is very suitable for bone assessing.

The aims of study:

To assess the validity of CBCT in studding the topographical relationship of the roots of posterior maxillary teeth and maxillary sinus and to measure the bone thickness toward buccal and palatal cortical plates, and the effect of side, age, gender prior to dental intervention in the area of interest.

Materials and methods:

In this prospective study, the sample included 70 adult Iraqi subjects comprised of 35 male and 35 female with age range between (25-65) years old, who have visited the Second Specialized Dental Center in Baquba city taking Cone Beam Computed Tomography scanning for different diagnostic purposes from October 2016 to February 2017.

Using Cone Beam Computed Tomography, cross sectional images demonstrate the relation between the root of the maxillary premolars and molars and the sinus floor in 4 types classifications:-

- Type 0: the root is separate from the sinus floor.
- Type1: the root is in contact with the sinus floor.
- Type2: the root is projecting laterally along the sinus cavity, but is outside the sinus borders.
- Type3: the root is projecting into the sinus cavity.

The mean of thickness of bone between the root and the alveolar cortical plate was obtained using cone beam computed tomography cross-sectional images. For both buccal and palatal roots, the distance to the cortical plate is attained.

Both types of measurement were compared between genders and between different age groups and sides (Left and right). The unit of measurement was millimeter.

RESULTS:

In second molar the percentage of type 3 was highest in mesiobuccal root, while in type 2 was in mesiobuccal root of first molar, and in type 1 highest percentage was in palatal root of second premolar. Statistically the difference in vertical relation between maxillary posterior teeth and maxillary sinus floor for all examined teeth roots in all types was significant. Age had obvious effect on the risk of having positive contact. Gender had no obvious effect on the risk of having positive contact. The highest bone thickness was seen in buccal and palatal roots of second premolar. Statistically the difference in mean of mean bone thickness between the four examined teeth was significant. The bone thickness covering the roots of premolars and molars was has minimum thickness in type-2 vertical relation and thickest in type-1 vertical relation.

Conclusion

Cone Beam Computed Tomography scanning is important valuable imaging modality for assessment of the association of the roots of posterior maxillary teeth and maxillary sinus topographically, such relationship has important role in the prediction of movement of tooth during orthodontic management and spread of preapical or periodontal infection to the sinus or endodontic implications of the maxillary sinus.