Current and related literature abstracts

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Nutrient canals are small neurovascular bundles originating from the incisive branch of the inferior dental canal, in the mandibular anterior region. These canals travel upwards to the apices and interdental areas of the mandibular incisors. Identifying these canals is essential in obviating clinical morbidity, which may include a neurosensory disturbance and/or haemorrhage. Their prevalence on traditional periapical films has been reported in the literature as anywhere from 5 to 40%. This study used CT images to assess canal prevalence, location, number, size, shape and Hounsfield units (HU) of the nutrient canals themselves.

The study showed that the prevalence of nutrient canals in the mandible is 94.3%, with the majority of these in the anterior region (92.7%), premolar region to a lesser extent (42.4%) and rarely in the molar region (1.4%). As for the exact canal locations, the preponderance of these canals was found between mandibular central and lateral incisors, both left and right. This is true because these teeth are furthest from the inferior alveolar canal and therefore require alternate blood supply. While gender specific differences were not observed, the prevalence of nutrient canals in the mandibular premolar region for males was greater than for females—a clinically significant difference. Additionally, there were no gender differences when comparing the HU of males and females. Age did impact the foramina size. The shapes of the foramina were generally ovoid and did not change shape with age. Lastly, the size of these canals ranged from 0.4 to 2.0 mm in diameter. This paper underscores the diagnostic value of CT in visualising anatomy and reducing surgical morbidity.


Proper diagnosis and treatment planning is critical when placing immediate implants in the maxillary anterior region. In order to achieve optimum aesthetic results detail must be paid to the soft tissues. The soft tissue around implants is affected by three major factors: the position of the implant within its receptor site, labial bone thickness and tissue biotype. Studies show that a minimum of 2 mm labial bone thickness is sufficient to provide adequate soft tissue thickness. Thicker soft tissue will result in less recession and more stable interdental papillae. Additionally, thicker tissue will sufficiently mask potential discoloration of the underlying abutment. CBCT provides a cost-effective, low dose method of assessing both cortical bone thickness as well as tissue thickness.

In this study, cross-sectional images of maxillary central incisors where measured for facial and palatal...
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A literature review of current publications focused on the relationship between cortical thickness, facial and palatal tissue thickness, and alveolar crest width. The bone and tissue thickness were measured at three locations: cervical, middle, and apical. In the cervical areas, strong correlations were found between the labial bone thickness and corresponding soft tissue, palatal bone thickness and corresponding soft thickness, as well as a correlation between bone thickness and buccal-palatal socket dimensions (wider sockets may associate with thicker labial cortices). The authors found no correlation between the position of the maxillary central incisor (forwards inclined, normal or backwards inclined) in the socket to the thickness of cortical bone in the cervical area. The majority of teeth (64%) had proclined roots compared to 30% having normally positioned roots, with the proclined teeth having a lower thickness of bone on the palatal in the apical area. As for the facial bone, this study demonstrated that 36.7% had labial bone thickness greater or equal to 1 mm, whereas 63% had < 1 mm of bone.

While no correlation was found between the position of the tooth in the alveolus and the labial cortical bone thickness, the tooth position does have significant implications for implant placement and underscores the importance of CBCT analysis prior to tooth extraction. The position of the tooth in the socket can dictate the implant trajectory and this will, in turn, be affected if grafting is needed, as well as if the implant will be cement vs screw retained.

When placing immediate implants in the maxillary anterior region, the position of the tooth within the alveolus must be evaluated prior to implant placement. Sagittal slices from CBCT are a cost-effective way to do this with low dose radiation. This study evaluated the angulations of upper and lower anterior teeth with respect to alveolar bone in a Chinese population.

Sectional slices containing maxillary and mandibular central incisors, maxillary and mandibular lateral incisors, and maxillary and mandibular canines were analyzed to compare the angulation of the root relative to the bony housing itself (Fig. 3). The study found that maxillary anterior teeth were closer to the labial alveolar surface and therefore more divergent to the alveolus itself (17.65 degrees for the central incisor, 18.79 degrees for the lateral, and 23.82 degrees for the canine). The mandibular incisors, however, were usually less than 8 degrees difference from the alveolus itself. Measurements of the maxillary alveolar bone were measured in three places: crestal, midroot, and apical. What was noteworthy was that at the midroot level, the labial thickness was less than 1 mm in 77–90%; 42.4% of maxillary canine teeth were less than 5 mm and almost all maxillary anterior teeth had labial thicknesses less than 2 mm. The authors suggest these numbers as a plausible explanation to the higher frequency of perforation at the midroot level.

Given the greater incidence of the maxillary roots being closer to the labial plate, the implant would be placed with a more labial inclination to access the available palatal bone necessitating the need of angled abutment. Conversely, because the mandibular incisors are closer in angulation to the alveolar bone, it is more likely a straight abutment can be used. CBCT is, therefore, instrumental in treatment planning immediate implants in the anterior region prior to tooth extraction.

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**About the Author**

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