



**THREE DIMENSIONAL ASSESSMENT OF CORTICAL BONE OF INFRA-ZYGOMATIC
CREST AND MANDIBULAR
BUCCAL SHELF IN ADULTS FOR ORTHODONTIC
BONE SCREW INSERTION IN A SAMPLE OF
ERBIL CITY**

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ABSTRACT

Background and objectives: One of the important factors for placing orthodontic bone screws in the maxilla and mandible is the cortical bone thickness. The objectives of this study were to anatomically assess the infra-zygomatic crest (IZC) in the maxilla and buccal shelf in the mandible as the insertion site for orthodontic bone screw and determine any differences according to side and gender.

Subjects and Methods: The study included CBCT scans of 40 untreated orthodontic adult patients (20 males, 20 females; with average age, 20-40 years). In the maxilla, IZC thickness, lateral wall thickness of the maxillary sinus, and insertion positions were evaluated. In the mandible, the measurements of cortical bone thickness, buccal shelf bone width at 4, 6 and 8 mm below the cemento-enamel junction (CEJ) and distance between the inferior alveolar nerve and the outer surface of the cortical bone were taken at 4 different sites: buccal to mesiobuccal cusp of mandibular first molar (6M), distobuccal cusp of the first molar (6D), mesiobuccal cusp of the second molar (7M) and distobuccal cusps of the second molar (7D).

Results: In the maxilla, the IZC thickness above the maxillary first molar showed the highest thickness when it was measured at 70° insertion angle and it showed the least thickness at 40° insertion angle and it was 9 to 17 mm above the maxillary occlusal plane when measured at 40° to 70° insertion angles. In the mandible, the cortical bone thickness was the thickest at 6M site and the thinnest at 7D site. Buccal shelf width at 4, 6 and 8 mm below CEJ; the thinnest site was at 6M site and the thickest site was at 7D site. However, 6M site had the nearest distance to the nerve and 7M site had the furthest. The cortical bone in the infra-zygomatic crest and mandibular buccal shelf areas were significantly thicker in males than females. However, no significant differences were found between the right side and left sides.

Conclusions: The most appropriate bone screw insertion position in the IZC was 12 to 15 mm above the maxillary occlusal plane and the first molar at an angle of 50° to 60° to the maxillary occlusal plane and in the buccal shelf it was at the mesiobuccal site of the mandibular second molar (7M).

Keywords: CBCT, orthodontic bone screw, infra-zygomatic crest, buccal shelf, cortical bone.

