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**BONE DENSITY IN SIX ANATOMICAL SITES OF THE JAWS IN YOUNG FEMALES AGAINST THE BACKGROUND OF STABLE ESTROGEN LEVELS: A CBCT-BASED STUDY FOR SURGICAL AND DENTAL IMPLANTOLOGY PLANNING**

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**Relevance.** The success of oral surgical interventions—from extraction of impacted second molars and dystopic teeth to achieving primary stability in dental implants—depends critically on alveolar bone quality. Bone density, measured in Hounsfield Units (HU) via Cone Beam Computed Tomography (CBCT), reflects bone strength. According to the Misch classification, bone density is categorized into four types: D1 (>1250 HU, dense compact bone); D2 (850–1250 HU, thick porous compact bone); D3 (350–850 HU, thin porous compact bone); and D4 (150–350 HU, fine trabecular bone). Estrogens play a fundamental role in bone homeostasis, regulating the balance between resorption and formation. In young females of reproductive age (18–44 years), stable physiological hormone levels maintain active bone metabolism and preserve mineral density, in contrast to the postmenopausal state where estrogen deficiency leads to accelerated bone resorption. Understanding bone density under normal hormonal conditions is clinically critical for surgical planning before age-related decline begins.

**Aim:** to characterize bone density values at six anatomical sites in the maxilla and mandible of young female patients using CBCT, classify them according to Misch, and draw clinically applicable conclusions for surgical planning.

**Materials and methods.** CBCT scans of 13 young female patients from the 20th Outpatient Polyclinic in Minsk were analyzed. The age range was 20–43 years, with mean age  $35.5 \pm 7.7$  years (median 38.5 years, lower quartile 34 years, upper quartile 41 years). All patients were of reproductive age without postmenopausal hormonal influence. Bone density was measured at six standardized apical areas: right and left mandibular second molars (Sites 1–2), right and left mandibular central incisors (Sites 3–4), and right and left maxillary first molars (Sites 5–6). For each site, mean and standard deviation were calculated. The Misch classification was applied for clinical interpretation.

**Results and their discussion.** At Sites 1–2 (mandibular second molars), mean bone density was  $694.25 \pm 117.14$  HU (right) and  $686.0 \pm 143.40$  HU (left), corresponding to Misch class D3. The minimal difference between right and left sides (8.25 HU) confirms bilateral symmetry in healthy young women. At Sites 3–4 (mandibular central incisors), mean density was  $779.25 \pm 125.90$  HU (right) and  $774.58 \pm 117.12$  HU (left), approaching the D2 range (850–1250 HU). This high density in the symphysis region—confirms its suitability as the preferred donor site for bone grafting. At Sites 5–6 (maxillary first molars), mean density was  $541.6 \pm 111.80$  HU (right) and  $615.3 \pm 148.12$  HU (left), both within D3 range but notably lower than mandibular sites. The greater right-left difference in the maxilla (73.7 HU) suggests higher inter-individual variability. No D1 or D4 bone was observed, reflecting the protective effect of stable estrogen levels against severe bone loss.

**Conclusions.** In young females of reproductive age, bone density follows a predictable anatomical gradient: mandibular incisor region (approaching D2) > mandibular molar region (D3) > maxillary molar region (D3). The symphysis is the densest region, confirming its suitability as a donor site for bone grafts and for implant placement with predictable primary stability. The absence of D4 bone highlights the protective role of physiological estrogen levels against severe density reduction. Maxillary molars, exhibiting the lowest density within the D3 range, require cautious surgical planning—tapered implants and longer healing periods are recommended. These findings provide clinically useful reference values for patients undergoing oral surgical procedures, enabling evidence-based predictions of extraction difficulty and dental implant prognosis.