

Mandibular Angle Bone Apposition Is Associated With a Class II Cephalometric Phenotype: A Retrospective Cross-Sectional Radiographic Study

Nishat Bharde

Qatar University, Doha, Qatar

Ahmad Atta

Dental Student, College of Dental Medicine, Qatar University, Doha, Qatar

Dr. Dania Ahmad

Orthodontist, Department of Orthodontics, University of Jordan, Amman, Jordan

Dr. Mohanad Gamal Al-Nahdi

Research Collaborator, King Abdulaziz University, Jeddah, Saudi Arabia

Dr. Khandaker Reajul Islam

Department of Orthodontics, Dhaka Dental College, Dhaka, Bangladesh

Muhammad E.H. Chowdhury

Professor, Department of Electrical Engineering, Qatar University, Doha, Qatar

Faleh Tamimi

Professor, Faculty of Dentistry, McGill University, Montreal, Canada; College of Dental Medicine, Qatar University, Doha, Qatar

Abstract:

Background: Mandibular angle bone apposition has been proposed as a radiographic marker of adaptive remodeling at the masseter muscle insertion site. However, its relationship with craniofacial and facial-profile characteristics remains unclear.

Objective: To investigate whether mandibular angle bone apposition is associated with skeletal, dental, and soft-tissue cephalometric features in adults.

Methods: This retrospective cross-sectional radiographic study included 437 adult lateral cephalometric radiographs. Mandibular angle bone apposition was graded using the Türp et al. classification system. Due to small numbers in higher-grade groups, Grades 1–3 were combined and compared with Grade 0. Thirty-three cephalometric variables were analyzed using independent-samples t-tests.

Results: Grade 0 included 298 participants, while Grades 1–3 included 139 participants. Sixteen of 33 cephalometric variables differed significantly between groups. Participants with mandibular angle bone apposition showed features consistent with mandibular retrusion and a greater skeletal Class II tendency. Dental findings suggested compensation, including reduced upper incisor prominence,

increased lower incisor prominence, and greater occlusal cant. Soft-tissue findings included greater upper and lower lip prominence relative to the esthetic plane and a larger nasolabial angle.

Conclusions: Mandibular angle bone apposition was associated with a distinct cephalometric phenotype characterized by mandibular retrusion, Class II skeletal tendency, dentoalveolar compensation, and altered soft-tissue profile. These findings may be relevant to orthodontic diagnosis, facial-profile assessment, and esthetic treatment planning.