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FENESTRATION OF THE COMPACT PLATE OF JAW BONE TISSUE AFTER

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Orthodontic treatment, while effective in correcting malocclusions, can inadvertently lead to fenestration of the compact cortical plate.

Fenestrations, which are isolated areas in which the root is denuded of bone and the root surface is covered only by periosteum and overlying gingiva, represent a key side effect, influenced by biologic and biomechanical factors upon orthodontic treatment. Pre-treatment imaging of alveolar morphology is essential to predict and mitigate these defects.

Fenestration can arise from orthodontic mechanics that decentralize teeth beyond the alveolar bone envelope, particularly in thin bone plates. Primary factors include crowding, misaligned teeth, buccolingual movements, and treatment design elements like intrusion amount or type, retraction, molar distalization, and attachment numbers.

Moreover, inadequate bone support, rapid maxillary expansion, and excessive force magnitude and frequency heighten risks of fenestration. High-risk profiles feature thin alveolar thickness and initial tooth malposition.

Fenestrations predominate on buccal surfaces, with greater maxillary prevalence, especially at first premolars and molars. Class II malocclusion shows significantly higher rates than Class I or III. Labial fenestrations notably affect maxillary lateral incisors/canines and mandibular central incisors/canines, linked to intrusion amounts.

Currently, techniques such as periodontal accelerated osteogenic orthodontics as well as combination of bone grafting and free mucosal graft have demonstrated promising results in the treatment of orthodontically induced fenestration.

Understanding alveolar anatomy and tailoring mechanics via CBCT-guided planning, enables safer orthodontics. Limiting tooth movements within bone limits preserves periodontal integrity and minimizes fenestration risks.