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Original Article

Comparison of 3-dimensional postoperative dental movement in Class III surgical correction with and without presurgical orthodontic treatment

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ABSTRACT

Background: Surgery-first approach (SFA) is an emerging concept that surgically reposition the jaw bones without presurgical orthodontic treatment phase. The study investigated 3D dental movement in the postoperative orthodontic phase with orthodontic-first (OF) and SFA in orthognathic surgery (OGS).

Methods: This study included consecutive 40 patients (20, SF group; 20, OF group) skeletal Class III who underwent 2-jaw OGS correction. The data of cone-beam computed tomography were acquired at 3 stages with the scan of dental models to replace the dentition of the craniofacial images; at before OGS (T0), 1 week after OGS (T1) and at the completion of treatment (T2). The skeletal changes were obtained by overall superimposition. The post-operative dental movement was measured by 3D regional superimposition between T1 and T2.

Results: There were no significant difference in the postsurgical orthodontic movement in both groups except significant upper and lower molars extrusion by 2 mm in the SF group. Both groups exhibited no significant difference in mandibular stability in sagittal and vertical directions. The amount of extrusion in the molars was correlated with a post-operative sagittal mandibular forward movement. The total treatment duration was significantly shorter 230 days in the SF group.

Conclusion: The completion of the orthodontic treatment after OGS in the SFA was mainly accomplished through molar extrusive movement in both arches. The surgical setup of dental occlusion with 4 mm posterior open bite could be corrected during the postsurgical orthodontics in SFA through molar extrusion. The dental occlusion outcome was no different between OF and SFA.

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