

ARTICLES FROM CURRENT ORTHODONTIC LITERATURE, SELECTED AND REVIEWED BY: RESIDENTS, DEPARTMENT OF ORTHODONTICS, UNIVERSITY OF TEXAS, SAN ANTONIO

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Surgery-first stability concerns

Wei H, Liu Z, Zang J, Wang X. Surgery-first/early-orthognathic approach may yield poorer postoperative stability than conventional orthodontics-first approach: a systematic review and meta-analysis. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2018;126:107-16.

The surgery-first/early-orthognathic approach (SFEA) can involve orthognathic surgery either without presurgical orthodontic preparation or with minimal orthodontic preparation of less than 6 months. The purpose of this systematic review and meta-analysis was to explore the stability of the SFEA approach. Two of the authors selected 12 articles comparing postoperative stability between SFEA and the conventional orthodontic approach (COA). Owing to the esthetic significance of the chin and its role in facial profile balance and harmony, the primary outcome measure was the postoperative horizontal changes of the pogonion. There was a total of 498 participants. In 6 of the articles, there was no active orthodontic treatment before surgery, and the other 6 articles had a minimal phase of presurgical orthodontic treatment. The SFEA group had less postoperative stability than COA group (weighted mean difference 1.50; $P < 0.00001$). One of the interesting findings was that the mandible tended to rotate counterclockwise in the SFEA group. There are several factors that could contribute to this instability: unstable occlusion after

surgery with compressive forces of the masseter muscle, mandibular autorotation after removal of surgical splints, and a high degree of tooth movement in the postsurgical orthodontic phase. Postsurgical regionally accelerated tooth movement can also cause immediate rotational relapse. The authors also found that a minimal phase of presurgical orthodontic treatment did not reduce the postoperative relapse. However, it is important to recognize that all of the studies included by the authors were skeletal class III malocclusions. Therefore, the conclusions are not generalizable across malocclusion type. Occlusal stability seems to play an important role in minimizing relapse.

Reviewed by Megan Favor

Early anterior crossbite correction

Vasilakos G, Koniaris A, Wolf M, Halazonetis D, Gkantidis N. Early anterior crossbite correction through posterior bite opening: a 3D superimposition prospective cohort study. Eur J Orthod 2018;40:364-71.

Early correction of anterior crossbite is integral to optimizing skeletal development and TMJ function. This prospective cohort study attempted to assess the effectiveness, clinical performance, and adverse effects of early correction of anterior crossbite with the use of bilateral occlusal buildups. Sixteen consecutively selected patients (mean age 8 ± 0.9 years, range 6.2-9.3 years) with anterior crossbite in the mixed dentition were included in the study. Resin-modified glass ionomer buildups were added to the occlusal surfaces of the lower mandibular second primary molars or first permanent molars to raise the bite 1-2 mm more than an edge-to-edge bite relationship. The buildups were removed immediately after correction of anterior crossbite and attainment of positive overjet. Active treatment lasted an average of 2.5 months (range 0.6-8.9 months). Anterior crossbite was corrected in 14 of the 16 patients (87.5%), and the results remained stable during the follow-up visit without any active retention. Dental casts were obtained 6-17 months after active treatment (T1) and superimposed over the initial casts (T0). Crossbite correction occurred primarily by means of maxillary incisor advancement—2.05 mm (0.97-5.45 mm)—and proclination— 9.35° (2.32° - 14.52°). The mandibular central incisors that were the antagonists of the teeth in crossbite moved 0.93 mm lingually (range 2.39-0.16 mm) and retroclined 4.15° (range 3.04° - 8.76°). Seven patients reported

moderate to severe pain during mastication in the first week, and no other adverse effects were reported. The relatively small sample size and lack of independent control were some limitations of the study. This simple technique seemed to work very well with a single incisor in crossbite (and adequate space for labial movement), but it was not as successful when more than 1 tooth was in crossbite.

Reviewed by Catalina Zambrano

Reduced tongue pressure in mouth-breathing patients

Azevedo ND, Lima JC, Furlan RMMM, Motta AR. Tongue pressure measurement in children with mouth-breathing behavior. J Oral Rehabil 2018;45:612-7.

Mouth breathing has been associated with facial and dental abnormalities, and reduced tongue pressure has been observed in some subjects with mouth-breathing behavior. This cross-sectional study attempted to compare tongue pressure between children with mouth-breathing behavior and those with nasal-breathing behavior. A secondary objective was to analyze the relationship between age and tongue pressure. Forty participants aged 5-12 years were assigned to 2 groups based on breathing pattern. Each group had a total of 20 subjects who were matched by sex and age. Tongue pressure was evaluated with the use of the Iowa Oral Performance Instrument. Subjects were asked to raise their tongue and squeeze the bulb of the instrument against the palate for 3 seconds. Three measurements were repeated for each individual, with 30-second intervals between measurements. The maximum value was recorded for each participant. The authors found that the mean tongue pressure of the mouth-breathing group (32.4 kPa) was significantly lower than that of the control group (51.4 kPa). There was a strong positive correlation between tongue pressure and age in the nasal-breathing group but not in the mouth-breathing group. There was no difference in tongue pressure between sexes in either group. However, the authors did not provide reliability data for the tongue-pressure measurements. In addition, it is unknown if these differences between the 2 groups would persist into adolescence. An

interesting topic for future research might be to evaluate the change in tongue pressure after cessation of mouth breathing.

Reviewed by Hala Alsalman

Shorter treatments in surgery-first cohort

Jeong JH, Choi SH, Kim KD, Hwang CJ, Lee SH, Yu HS. Long-term stability of preorthodontic orthognathic bimaxillary surgery using intraoral vertical ramus osteotomy versus conventional surgery. J Oral Maxillofac Surg 2018;76:1753-62.

In recent years, there has been an increase in the “surgery-first” approach for patients requiring combined orthognathic and orthodontic care. This has led to research evaluating the stability of conventional orthognathic/orthodontic treatment (CS) versus preorthodontic orthognathic surgery (POGS). The purpose of this study was to evaluate the posttreatment stability of CS versus POGS in Class III malocclusions treated with the use of intraoral vertical ramus osteotomy (IVRO) rather than sagittal split ramus osteotomy. Only cases that were treated without premolar extractions were included. Each patient’s treatment included a 1-piece Le Fort I osteotomy with rigid internal fixation and IVRO setback, followed by 7 days of intermaxillary fixation. Postsurgical stability was evaluated regularly for 31 patients over 2 years. The only measurement that the authors identified as having statistical significance was the sella-nasion to occlusal plane angle (SN-OP). In the CS group, SN-OP increased by $2.0 \pm 2.4^\circ$ and in the POGS group it decreased by $0.8 \pm 1.5^\circ$. Previous studies have shown a similar postsurgical increase in the SN-OP angle in IVRO-treated cases, which might be due to a downward and backward movement of the mandible after surgery. The authors conclude that POGS and CS have similar long-term stability. On average, treatment time was 4 months shorter in POGS-treated patients (14 months vs 18 months). This might be attributable to a postsurgical regionally accelerated phase of tooth movement. It would be beneficial to include an objective measure of the quality of the final orthodontic result, such as the American Board of Orthodontics cast-radiograph evaluation, to confirm that the shorter treatment time with POGS is not due to a reduction in the quality of the orthodontic outcome.

Reviewed by Calvin Tardy