

PRE-SURGICAL PREPARATION AFFECTS PATIENTS' QUALITY OF LIFE

The correction of maxillomandibular skeletal discrepancies by means of orthognathic surgery leads not only to occlusal and aesthetic improvements, but also improves patients' quality of life and self-esteem. Classically, treatment with orthognathic surgery requires orthodontic preparation, which aims to harmonize the teeth with their bone bases. However, in recent years, anticipated-benefit surgery has become popular. This technique opts for surgery before orthodontic treatment. Its supporters argue that it allows for immediate facial improvement, with a consequent improvement in patients' self-esteem and quality of life. However, little evidence is available to support these claims. To address this gap in the literature, English researchers developed a study¹ that aimed to determine whether early-benefit surgery improves or not quality of life, anxiety, and depression in patients with dentofacial deformities. A team of multidisciplinary researchers collected data from 32 patients with ages ranging from 17 to 47 years. The authors concluded that both treatment modalities (prior orthodontic preparation or surgery first) improved patients' quality of life and facial aesthetics after six weeks post-surgery. However, the authors point out that preoperative orthodontics worsened patients' quality of life and symptoms of anxiety and depression, although the timing of the operation did not affect those symptoms.

MOUTHGUARDS: AN ORTHODONTIC PATIENT'S ALLY WHEN PLAYING SPORTS

Playing sports benefits individuals and society, preventing disease and contributing to people's physical and psychological formation. Playing sports should be encouraged for everyone, including orthodontic patients. However, when playing sports, a patient using orthodontic appliance must take care to safeguard the integrity of the teeth and the orthodontic appliance. Orthodontic patients often use mouthguards,

but doubts remain as to whether they are effective and whether the type of bracket influences their effectiveness. To answer these questions, Brazilian researchers developed a study² that aimed to analyze the influence of using a mouthguard and the type of orthodontic bracket (metallic or ceramic) on the biomechanical response during an impact. For this purpose, a two-dimensional model of a patient with an increased overjet was created based on a tomographic image (Fig 1). Then, the researchers conducted a finite element analysis of the dynamic impact, in which a steel object collided with the model at a speed of 1 m/s. Based on the results, the authors concluded that the presence and type of orthodontic brackets alter the stress distribution and deformation of the teeth during impact. Ceramic brackets generated greater tension than metallic brackets, and mouthguards reduced stress and deformation regardless of the composition of the bracket.

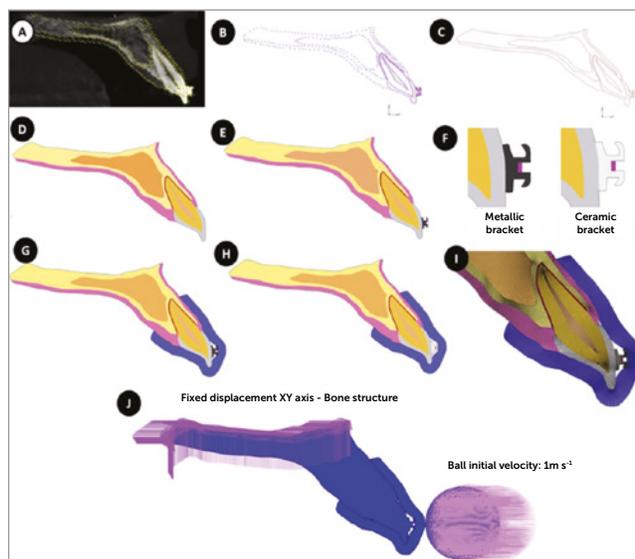


Figure 1 - Generation of two-dimensional finite element models. Source: Alves et al.², 2020.

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RAPID EXPANSION COMBINED WITH REVERSE MAXILLARY TRACTION PROMOTES FAVORABLE CHANGES TO THE AIRWAYS

The treatment of Class III malocclusion is one of the greatest challenges faced by orthodontists. A range of possibilities can be associated with this malocclusion, such as maxillary retrusion, mandibular prognathism or both. The gold standard for treating maxillary retrusion in a growing patient is rapid expansion combined with maxillary reverse traction. These therapies promote transverse and anteroposterior maxillary correction. Several studies have evaluated the effects of this treatment modality on the oropharyngeal and nasopharyngeal dimensions; however, they have yielded conflicting results. To verify this unconfirmed hypothesis, Italian researchers developed an study³ in which they analyzed 47 patients with Class III malocclusion who were treated with rapid maxillary expansion followed by reverse traction (Fig 2) and compared them to 18 untreated control patients. Their results demonstrated that treatment with rapid maxillary expansion followed by reverse traction promoted favorable and significant sagittal changes in the oropharyngeal and nasopharyngeal airways in individuals with Class III malocclusion, compared to untreated controls. They also found that these changes were maintained long term.

EARLY SPACE CLOSURE AFTER TOOTH EXTRACTION INCREASES THE OCCURRENCE OF GINGIVAL CLEFTS

A frequent complication associated with space closure after permanent tooth extraction is the development of a gingival cleft, which can delay or prevent the complete closure of the space, cause recurrence (re-opening) after the space closes, or impair the aesthetic result of the treatment. Few studies on this topic are found in the literature, and they tend to have conflicting results. Although hypotheses differ, orthodontists agree that the timing of space closure impacts aesthetics. Based on this assumption, researchers from Sweden and Austria developed a study⁴ that aimed to assess whether prompt or delayed closure of the orthodontic space after the extraction of a permanent tooth affects the incidence of gingival cleft development. The study was conducted with 25 patients who required bilateral extraction of premolars due to orthodontic reasons. One premolar, chosen at random, was extracted eight weeks before beginning the space closure (delayed movement) while the contralateral premolar was extracted one week before the space closure (early movement). The presence or absence of gingival clefts was evaluated at three and six months. The results indicated that gingival clefts are found frequently during the closure of an orthodontic space and occur more frequently with early space closure after extraction.

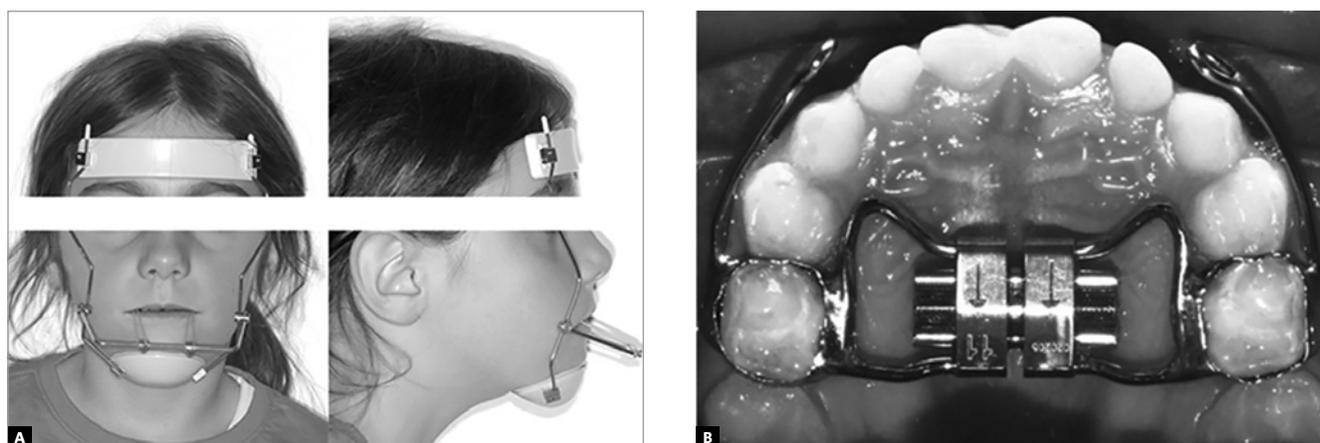


Figure 2 - Facemask (A) and expander appliance (B) used. Source: Cretella Lombardo et al.³, 2020.

PRESENCE OF BRACKETS DOES NOT INTERFERE WITH THE QUALITY OF INTRAORAL SCANNING

The use of an intraoral scanner has become routine in orthodontic clinics. The advent of the intraoral scanner hastened diagnoses and enabled orthodontists to quickly send digital models anywhere in the world via the Internet. Models based on these scans have many uses, including serving as an initial and final study, fitting orthodontic devices, and in orthognathic pre-surgery. However, in the latter application, the question remains whether these models are accurate, since they are obtained in the presence of orthodontic brackets. To address this matter, Korean researchers developed a study⁵ performing intraoral scans on 30 patients using iTero and Trios scanners. In sequence, the two scan sets, with and without brackets, were superimposed to assess any distortion. The results revealed that the general discrepancies between intraoral scans with and without brackets were within 0.30 mm, and the distortion of the images occurred within 0.50 mm around the brackets. This indicates that the accuracy of intraoral scanners, even in the presence of brackets, is clinically acceptable.

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