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QUALITY OF LIFE IS SIMILAR BETWEEN FIXED APPLIANCES AND INVISALIGN USERS

The role of orthodontic treatment in improving patients' quality of life is well known. In the past, orthodontic treatment only focused on the esthetics of the smile. However, recent publications have found that these treatments also improve quality of life, thus enhancing their importance. Today, one cannot think of orthodontics without thinking of orthodontic aligners. Much has been said about the esthetic improvements of these devices. However, evidence of aligners' other

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benefits in terms of function, stability, and quality of life remains inconclusive. Thus, Canadian researchers developed a study that aimed to compare quality of life in users of fixed orthodontic appliances and aligners.¹ The researchers recruited adolescent patients under active treatment for a minimum of six months with Invisalign or fixed appliances. In total, 74 patients (37 in each treatment group) participated in the study. These patients answered a questionnaire that assessed quality of life. The authors found that both treatment groups were very satisfied with their treatment modality, and their quality of life was similar.

EXCESSIVE FORCE ON MOLAR INTRUSIVE MOVEMENT DOES NOT INCREASE THE AMOUNT OF ROOT RESORPTION

The intrusive movement of molars is one of the most difficult types of dental movement. In the not-so-distant past, intruding posterior teeth was a nearly impossible task. However, thanks to the advent of skeletal anchorage devices, intrusion supported by mini-implants and miniplates has become routine in orthodontic offices. However, the ideal amount of force to achieve this movement without damaging the tooth structure remains unknown. To address this, Egyptian researchers developed a randomized controlled clinical study² comparing root resorption resulting from the intrusion of maxillary posterior teeth using two different magnitudes of force. Adult patients with skeletal open bite and indication of dentoalveolar intrusion were recruited and

randomly divided into two groups. The control group received 200g of intrusive force, and the experimental group received 400g (Fig 1). Based on the results, the authors concluded that root resorption was inevitable with orthodontic intrusion. However, increased intrusive force did not increase resorption.

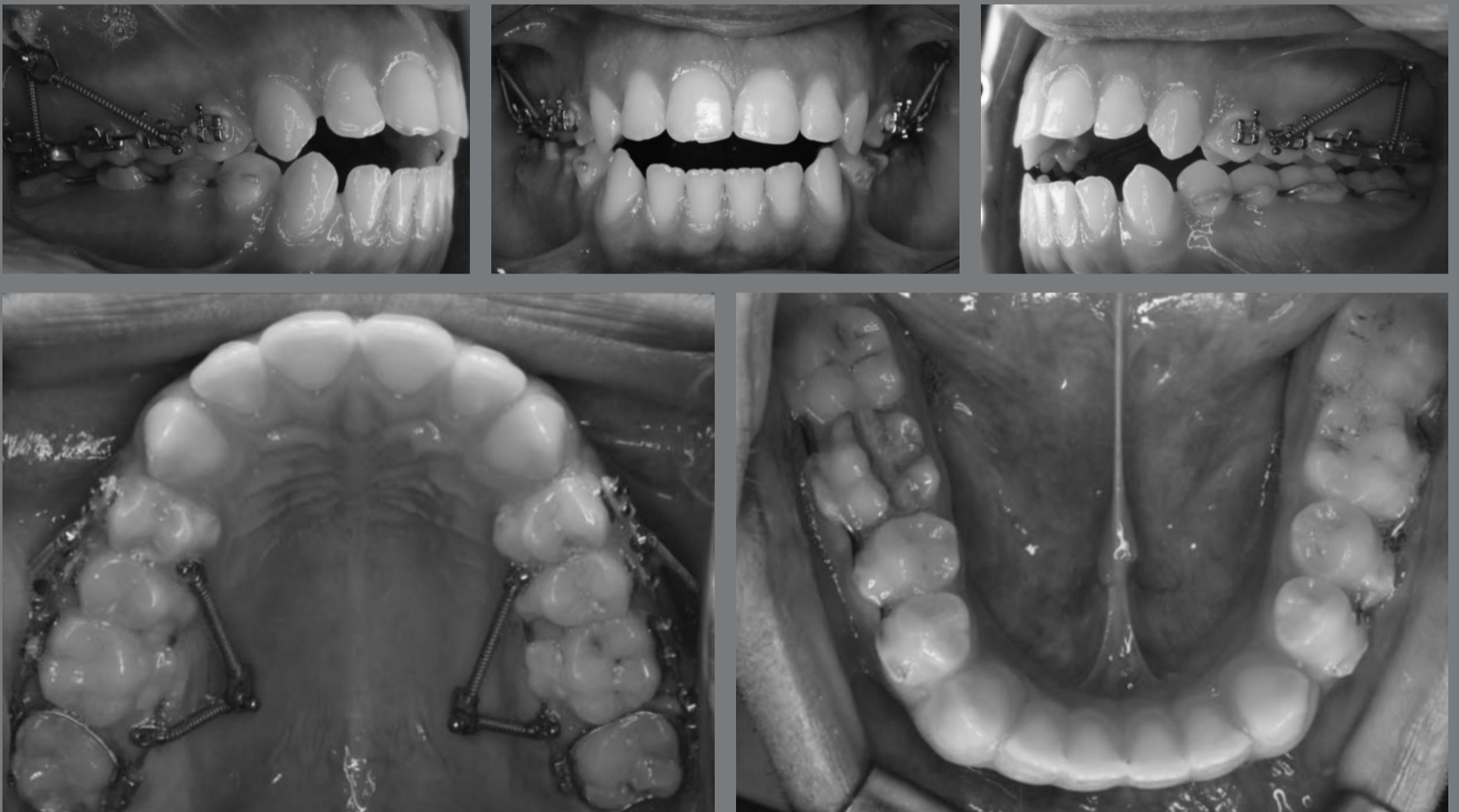


Figure 1: Appliance assembly showing the infra-zygomatic and palatal miniscrews and closed coil springs applying intrusive force on the maxillary posterior segments. Source: Akl et al.², 2021.

INVISALIGN IS INEFFICIENT FOR CORRECTION OF CLASS II MALOCCLUSION

The relentless search for aesthetically pleasing orthodontic appliances resulted in the development of orthodontic aligners by Kesling in 1945. Aligners became popular as they received more publicity and technology advanced. Aligners are seen by many as a successor to conventional fixed appliances. However, scientific literature evaluating this treatment modality is scarce. Uncertainty remains about how much correction can be achieved with aligners. Recently, a group of American researchers and one Brazilian researcher developed a study³ that aimed to determine whether Class II malocclusion can be treated with Invisalign orthodontic aligners. A sample of 80 adult patients using Invisalign was divided into two groups: one with Class I malocclusion and the other with Class II malocclusion. To evaluate the treatment, seven measures adopted by the American Board of

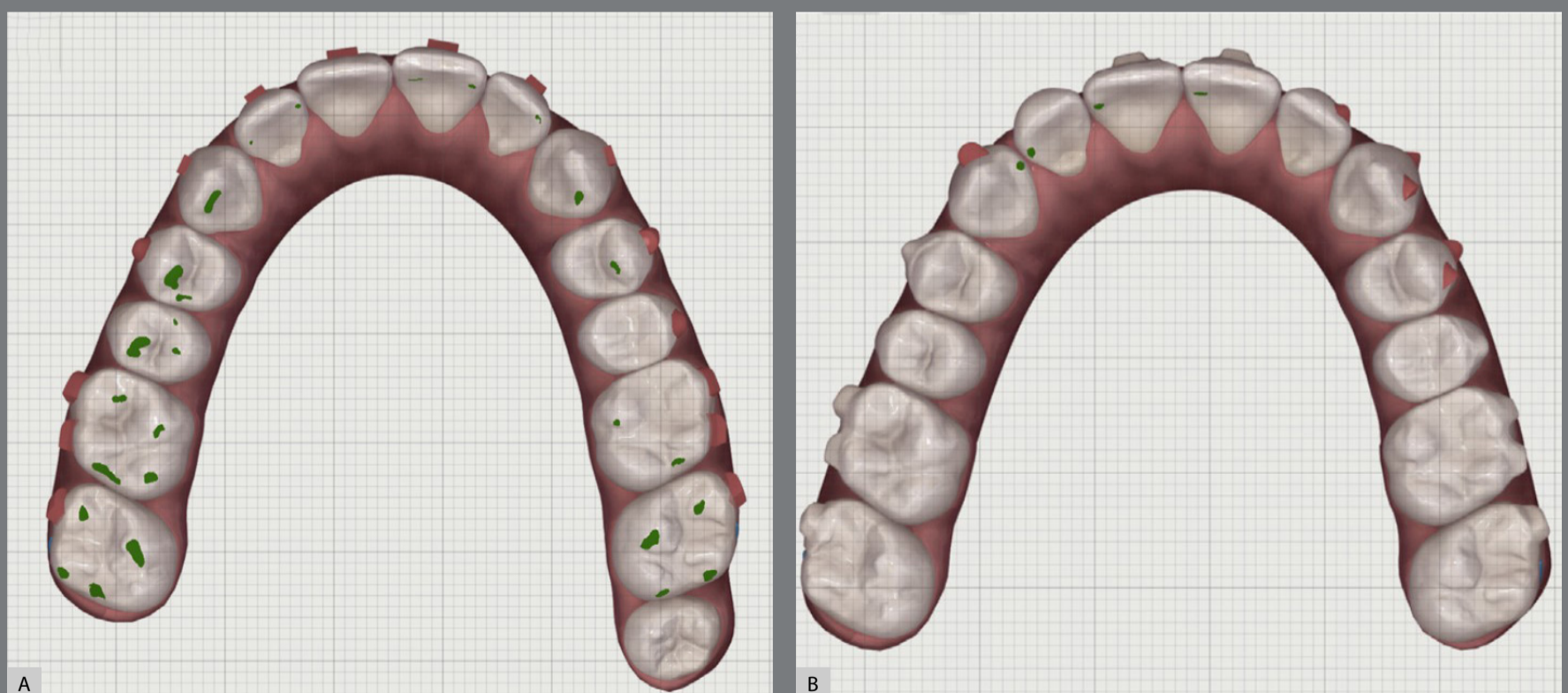


Figure 2: Occlusal contacts: **A)** before treatment; **B)** after treatment. Source: Patterson et al.³, 2021.

Orthodontics were used to evaluate anteroposterior and vertical dimensions. The initial measurements, a prediction by ClinCheck (Align Technology), and the post-treatment measurements (Fig 2) were compared. The results revealed that the amount of anteroposterior correction in patients with Class II malocclusion was 6.8% of the predicted value. The amount of overbite correction achieved was 28.8% and 38.9% of the predicted values in patients with Class I and Class II malocclusion, respectively. The authors also noted that no patient with Class II malocclusion would meet the American Board of Orthodontics standards after treatment with Invisalign.

OVERJET CORRECTION CHANGES PATIENTS' POSTURE

It has become scholarly consensus that orthodontic corrections not only improve smile esthetics, but also improve patients' general and mental health. For example, the scientific literature reports that early treatment of children with severe malocclusion, especially Angle Class II malocclusion, prevents trauma to the incisors and positively influences orthopedic malformations. However, this nascent area requires more research. To advance knowledge in this area, a group of German researchers developed a study⁴ with the objective of analyzing the relationship between body posture and overjet in children before and after orthodontic treatment with removable functional orthodontic appliances (Fig 3). For this

study, 54 patients with increased overjet (> 9 mm) were recruited, and their body posture was assessed before and after orthodontic treatment. Open bite and crossbite cases were excluded. The authors concluded that the reduction in overjet during early orthodontic treatment may be associated with a detectable effect on pelvic torsion.

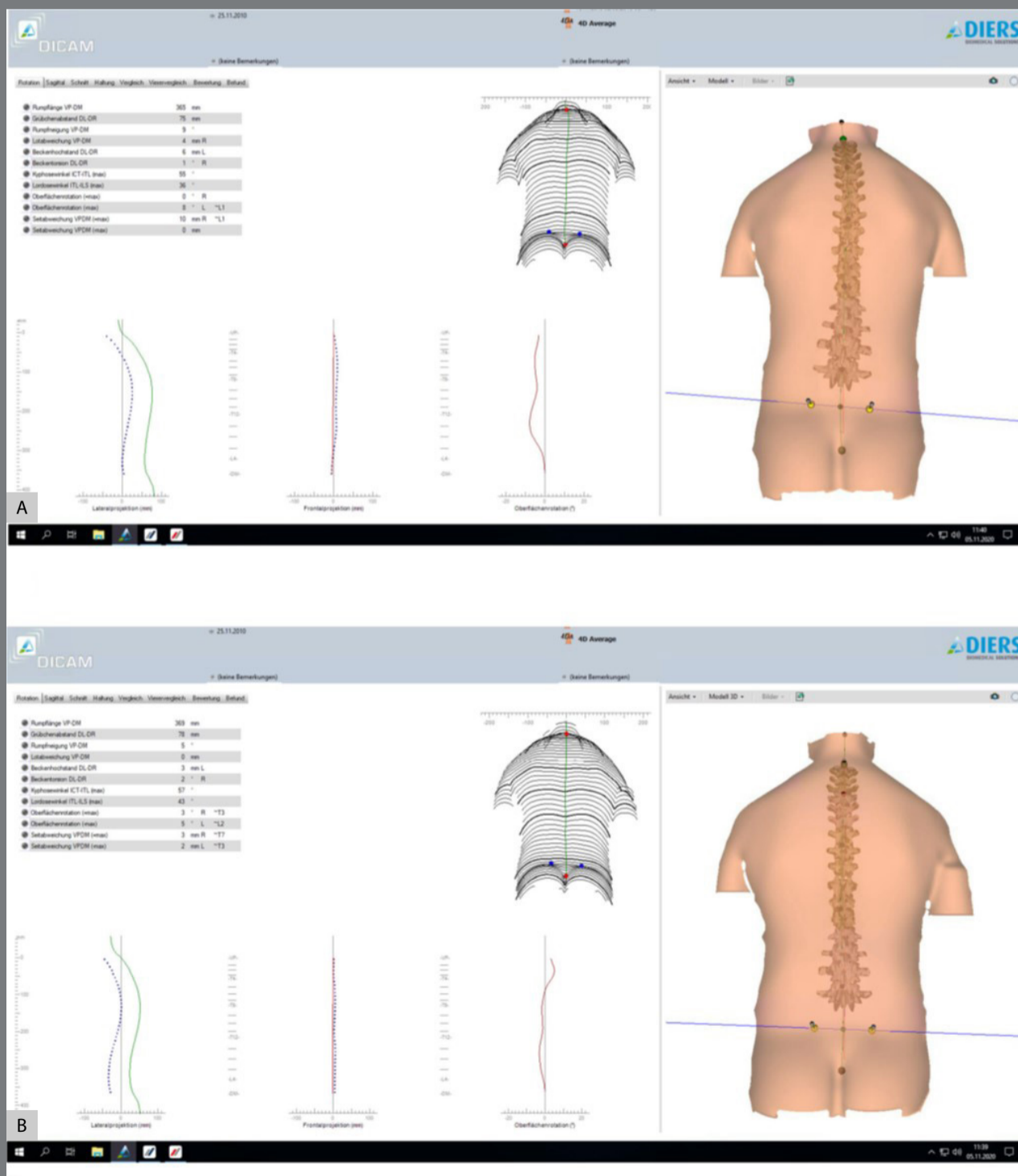


Figure 3: Rasterreographic measurement of a sample patient before (A) and after (B) early orthodontic treatment. Source: Klostermann et al.⁴, 2021.

MOBILE ORTHODONTIC APPLIANCES MADE OF ACRYLIC RESIN CAUSE CHROMOSOMAL DAMAGE

Acrylic resins have many applications in orthodontics, from the prevention and interception phases through treatment and containment of orthodontic results. Despite the various methods used in polymerizing acrylic resins, the monomer-to-polymer conversion is never complete, resulting in the release of monomers into the oral cavity during its use. The presence of residual monomers can alter the resins' final physical properties and lead to local and systemic tissue reactions. These reactions can manifest as local chemical irritation, hypersensitivity, and mucosal inflammation. The genotoxic potential of methyl methacrylate is not fully understood, and research in this area is needed because genetic damage at an early age can lead to the development of health problems later in life. Thus, Brazilian researchers developed a study⁵ aiming to investigate the occurrence of chromosomal damage and degenerative nuclear changes indicative of apoptosis and necrosis in exfoliated cells of the mouth and palate mucosa of children and adolescents using orthodontic appliances made of acrylic resin. Micronuclei and nuclear alterations were evaluated in cells collected from the cheeks and palates of 30 patients of both sexes, aged between 6 and 12 years. Cell evaluations were performed before device installation and 15 to 21 days after installation. The results revealed that direct contact of orthodontic appliances made of acrylic resins with the oral mucosa increases the incidence of chromosome damage and degenerative nuclear alterations.

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