

Matheus Melo Python<sup>1,2</sup>

### MICRO-OSTEOPERFORATION DOES NOT ACCELERATE ORTHODONTIC MOVEMENT

Fast-acting orthodontic treatments are desired by both patients and orthodontists. In recent years, a multitude of methods and products have been developed to this end. Osteoperforations are currently in fashion, mainly because the industry was able to take this old idea to sell customized osteoperforators. It is not the product that will make the difference, but rather the procedure. Thus, Iranian researchers developed a study<sup>1</sup> aimed at assessing the effect of micro-osteoperforation (MOP), made with mini-implants, over a period of three months, and determining the influence of the number of perforations on the canine retraction rate. In addition to assessing the amount of pain and discomfort caused by the method, a controlled, randomized triple-blind clinical trial was carried out with twenty-eight patients, ranging in age from 16.3 to 35.2 years, who needed

fixed orthodontic treatment. The patients were randomly assigned to groups MOP1 and MOP2. In each patient, one side of the mouth acted as a control that did not receive MOPs. Four months after extraction of the first premolars, patients in the MOP1 group received 3 MOPs in the vestibular of alveolar bone, on the experimental side, to accelerate canine retraction, while patients in the MOP2 group received three vestibular MOPs and three palatal MOPs on the experimental side (Fig 1). The amount of canine retraction was measured every 28 days, at three time intervals. Pain perception was also assessed, both on the day of the MOP procedure and subsequently at 24 h. The results of the study revealed that MOPs were effective in accelerating tooth movement over a period of three months; however, the increase in tooth movement after MOP application was not clinically significant. The results also revealed that there was no increase in the level of pain or discomfort with MOP.



**Figure 1** - A) MOP procedure. B) Nickel-titanium spring stretched between the force arm and the mini-implant. C) Canine retraction was calculated in the models by measuring the distance between two lines drawn at the midline of the lateral incisor and canine at three points – the incisal, middle and cervical thirds of the crowns. Source: Babanouri et al.<sup>1</sup>, 2020.

<sup>1</sup> Universidade Estadual do Sudoeste da Bahia, Disciplina de Ortodontia (Jequié/BA, Brazil).

<sup>2</sup> Universidade Federal do Rio de Janeiro, Programa de Pós-Graduação em Odontopediatria e Ortodontia (Rio de Janeiro/RJ, Brazil).

**Submitted:** April 21, 2020 - **Revised and accepted:** May 05, 2020

**Contact address:** Matheus Melo Python

Av. Otávio Santos, 395, sala 705 – Vitória da Conquista/BA – Brasil

CEP: 45.020-750 – E-mail: matheuspithon@gmail.com

### **THERE IS NO GOOD SCIENTIFIC EVIDENCE TO PROVE THE LOW CYTOTOXICITY OF AND RELEASE OF MONOMERS FROM THERMOPLASTIC DEVICES**

The use of thermoplastic materials in orthodontics has been growing daily. Their use has been concentrated on the manufacture of aligners and retainers. Despite widespread popularity, there is no consensus regarding the safety of these materials when in contact with oral tissues. Recently, a group of Greek and Swiss researchers published a systematic review and meta-analysis,<sup>2</sup> aimed at collectively evaluating the existing evidence from clinical and laboratory studies, concerning whether thermoplastic devices are associated with estrogenic/cytotoxic effects or bisphenol-A (BPA) release and monomers. Eight electronic databases were searched. In total, 58 articles were initially identified, with five included in the qualitative synthesis and two of those contributing to the quantitative syntheses. Four were in-vitro studies, while one was randomized; all evaluated some type of aligner or orthodontic retainer. The results revealed that no cytotoxic effects of thermoplastic devices could be confirmed based on the available evidence. Regarding the release of monomers or BPA, the evidence remained ambiguous. The authors emphasized that, due to the inconsistency of the available evidence, new laboratory and clinical studies with higher-quality methodologies are necessary.

### **INDIVIDUALS WITH AGENESIS OF THE UPPER LATERAL INCISOR HAVE AN INCREASED FREQUENCY OF CERVICAL ABNORMALITIES**

A common problem in orthodontic clinic is the congenital absence of any dental element, also known as agenesis. The upper lateral incisors are teeth that are often absent. There is a chance that the agenesis of upper lateral incisors could be accompanied by other bodily changes such as cervical abnormalities. In the search for evidence to prove this hypothesis, Chinese researchers developed a study<sup>3</sup> that aimed to evaluate the association between the congenital absence of the upper lateral incisor (MLI) with fusions of the cervical vertebral body, posterior arch deficiency and both anomalies. The study involved 64 individuals with agenesis of the upper lateral incisor (24 men and 40 women with a mean age of  $16 \pm 4.5$  years). Two hundred and fifty-six individuals (87 men and 169 women, with an average age of  $18.1 \pm 3.2$  years) were assigned

to the control group. The results revealed that in the group with lateral agenesis, 53.7% revealed fusion of the cervical spine, 11.1% indicated posterior arch deficiency and 9.3% showed fusion of the cervical spine with posterior arch deficiency. The morphological deviations of the cervical spine showed significant associations with the congenital absence of an upper lateral incisor, compared to the control group ( $p < 0.001$ ). Concluding that the individuals with MLI tend to have an increased frequency of cervical anomaly.

### **THE USE OF MOUTHWASH DURING ORTHODONTIC TREATMENT CAN CHANGE THE COLOR OF TOOTH ENAMEL**

Aesthetics are, without a doubt, the main motivating factor in the search for orthodontic correction. At the end of orthodontic treatment, aligned teeth with natural color and texture are desired. The use of a fixed orthodontic appliance favors bacterial accumulation, which, if not eliminated correctly and daily, can frustrate the final result, with a natural color and texture of the enamel potentially not being achieved. Mechanical methods, such as brushing and flossing, are considered the gold standard when addressing plaque removal; however, in orthodontic patients, these methods may not be sufficient, and may require the additional use of chemical methods in the form of mouthwashes. There is no consensus in the literature regarding the effect of different mouthwashes on the color of the enamel after orthodontic detachment, however. In search of an answer to this question, Turkish researchers developed an in-vitro study<sup>4</sup> that was aimed at evaluating the color changes in enamel surfaces after orthodontic bracket detachment, following the use of different mouthwashes. For this, a total of 100 human premolar teeth were used, which were randomly divided into 10 groups. The oral surfaces of each tooth were evaluated using a digital spectrophotometer. Following this, orthodontic brackets were bonded to the teeth. The rinses evaluated were Colgate Plax, Listerine Cool Mint, Klorhex and Tantum Verde. After removing the brackets, a final measurement of the enamel color was made. The results achieved with this study revealed that the use of mouthwashes during orthodontic treatment can cause visible changes in the color of the teeth. According to the authors, the Listerine Cool Mint proved to be the best mouthwash option, having a lesser effect on the color of the enamel.

## THE RELEASE OF IONS BY ORTHODONTIC APPLIANCES DEPENDS ON THE WELDING METHOD

The oral environment favors the biodegradation of metallic materials, associated with corrosion, due to chemical, physical and biological changes. Corrosion releases metal ions, and the products resulting from these reactions can trigger adverse effects, such as hypersensitivity. Although an increase in metal ions is commonly detected after the installation of orthodontic appliances, the levels can be considered low. Even if the amount released is low, however, there is a possibility of biological effects on oral cells, since these devices remain in the oral cavity for an extended period of time. In searching for materials and processes that can promote a lower release of metals from orthodontic

appliances, the science evolves. Recently, a study<sup>5</sup> was published in a well-respected international journal by Brazilian researchers whose proposal was to quantify the release of ions in the saliva of patients with lingual arches who received different welding methods when they were made. Sixty-four patients were divided into four groups: G1 (control), G2 (silver-soldered lingual arch), G3 (laser-welded lingual arch) and G4 (TIG-welded lingual arch). Saliva samples were collected at four different points, and analyzed for ion release over a period of 30 days. The results from this study revealed that, for most of the ions evaluated, there was no significant increase when comparing types of welding; however, in the TIG-welded lingual arches, there was a greater release of Ni ions.

## REFERENCES

1. Babanouri N, Ajami S, Salehi P. Effect of mini-screw-facilitated micro-osteoperforation on the rate of orthodontic tooth movement: a single-center, split-mouth, randomized, controlled trial. *Prog Orthod*. 2020;21(1):7.
2. Iliadi A, Koletsis D, Papageorgiou SN, Eliades T. Safety considerations for thermoplastic-type appliances used as orthodontic aligners or retainers. A systematic review and meta-analysis of clinical and in-vitro research. *Materials (Basel)*. 2020;13(8):1843.
3. Zheng BW, Chen YN, Muhammed FK, Abdullah AO, Liu Y. Association of congenital missing of maxillary lateral incisors with cervical vertebral body fusions and/or atlas posterior arch deficiency. *J Dent Sci*. 2020;15(1):114-7.
4. Korkmaz YN, Bulut M. Effect of mouthwashes on the discoloration of bracket-bonded tooth surfaces: an in vitro study. *Clin Oral Investig*. 2020 Mar 20. Ahead of print.
5. Schacher HRS, Menezes LM. Metal ion quantification in the saliva of patients with lingual arch appliances using silver solder, laser, or TIG welding. *Clin Oral Invest*. 2019 Dez;24:ID: 208646786.

**Author's identification (ORCID<sup>®</sup>)**

Matheus Melo Pithon (MMP): 0000-0002-8418-4139 