

Orthodontic retainers: Analysis of prescriptions sent to laboratories

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Objective: To investigate the most commonly fabricated orthodontic retainers.

Methods: Information on the type and amount of maxillary and mandibular retainers produced in a three-month period was collected from six laboratories (in the cities of São Paulo, Mauá and Guarulhos). The retainers were grouped according to the total production. For the maxillary arch, the groups were: 1S – Begg retainer, 2S – Hawley retainer, 3S – transpalatal arch retainer, 4S – buccal resin-arch retainer, and 5S – vacuum-formed retainer, Planas appliance, bonded lingual retainer and V-loop bonded lingual retainer. The groups relative to the mandibular arch were: 1I – 3-3 bonded lingual retainer (canine-to-canine), 2I – Hawley retainer and V-loop bonded lingual retainer, 3I – Begg retainer, 4I – buccal resin-arch retainer, vacuum-formed retainer and Planas appliance. The data were presented in box plots. Groups were compared using the Student's t-test with Bonferroni correction.

Results: The average of maxillary appliances fabricated ranged from 189.5 (1S) to 3.95 (5S). There were significant differences between groups 1S versus 5S and 2S versus 5S ($p < 0.0001$). Mean values for the mandibular retainers ranged from 55.3 (1I) to 4.2 (4I). Significant difference was observed between groups 2I and 4I ($p < 0.0001$).

Conclusions: For the maxillary arch, the most requested retainers were Begg and Hawley retainers. Regarding the mandibular arch, bonded lingual retainers and Hawley retainer were the most frequent ones.

Keywords: Orthodontics. Corrective. Orthodontic appliances. Relapse.

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Editor's abstract

Relapse of orthodontic treatment may be associated with several factors, such as periodontal and occlusal status, pressure applied by soft oral tissues, and growth. Consequently, the important function of retainers is to provide stability to the results of orthodontic treatment. Several orthodontic retainers have been described in the literature, and the frequency at which certain appliances are prescribed has raised a controversy because there are variations according to geographic areas and patient characteristics. This study investigated which retainers are most frequently manufactured in laboratories in the city of São Paulo and two other neighboring towns in Brazil. The authors collected information about the types and numbers of retainers for the maxillary and mandibular arches produced during three months in six laboratories that manufacture orthodontic

appliances in the city of São Paulo (n = 4), Mauá (n = 1) and Guarulhos (n = 1). Cluster analysis was used to group appliances according to total number of retainers made during the study time. For the maxillary arch, in descending order of demand, the groups were: 1S – Begg retainer (Fig 1), 2S – Hawley retainer, 3S – retainer with transpalatal arch, 4S – retainer with buccal resin bar and 5S – vacuum-formed acetate or polyethylene appliance, Planas retainers, fixed lingual arch, modified fixed lingual arch or V-loop bonded lingual retainers (Fig 2). Groups according to mandibular retainer were: 1 – 3-3 fixed lingual arch; 2 – Hawley retainer, modified fixed lingual arch and V-loop bonded lingual retainer; 3 – Begg retainer; 4 – retainer with buccal resin bar, vacuum-formed acetate or polyethylene appliance and Planas retainer (Fig 3). Results for the groups of maxillary and mandibular appliances were compared using the Student t test and the Bonferroni correction. The level of



Figure 1 - Maxillary Begg retainer after manufacture.



Figure 2 - Begg retainer placed in maxillary arch. This retainer has an area to stop the tongue at the level of the incisive papilla.

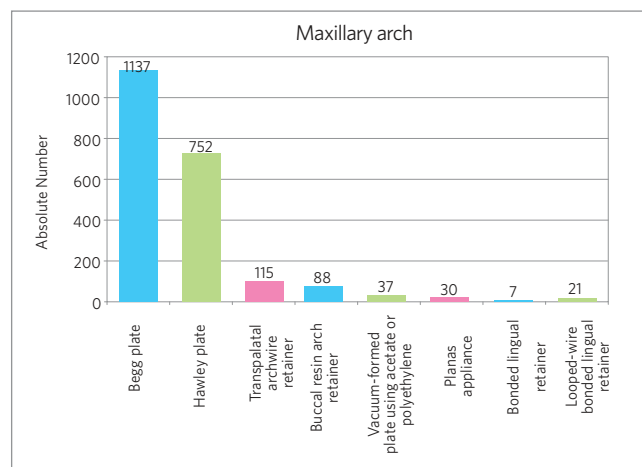


Figure 3 - Absolute numbers corresponding to the total production of maxillary orthodontic retainers, in six laboratories.

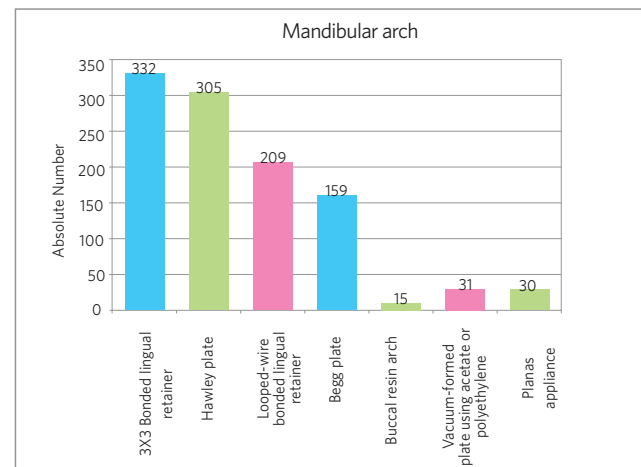


Figure 4 - Absolute numbers corresponding to the total production of mandibular orthodontic retainers, in six laboratories.

significance was set at 5%. Results showed that the mean number of maxillary appliances ranged from 189.5 (1S) to 3.95 (5S). There were significant differences between groups 1S and 5S, and between 2S and 5S ($p < 0.0001$). Mean number of mandibular retainers ranged from 55.3 (group 1) to 4.2 (group 4), and

results of group 2 were significantly different from those of group 4 ($p < 0.0001$). The authors concluded that the retainers most often prescribed for the maxillary arch were the Begg and Hawley retainers, and, for the mandibular arch, the fixed lingual arch and the Hawley retainer.

Questions to the authors

1) What criteria should be adopted by orthodontists to choose orthodontic retainers?

Orthodontists should analyze four factors that determine the prescription of retainers:

1. The characteristics of the dental arch to be retained. Adaptation of maxillary fixed retainers is difficult because of the occlusal contacts on the lingual surface of incisors. In contrast, fixed retention is a better choice for the mandibular arch, because it is more prone to the relapse of incisor crowding.
2. However, the compliance of patient should also be taken into consideration, as it is often preponderant when prescribing a fixed or removable retainer.
3. Particularly among young patients, the remaining growth potential and pattern should also be evaluated. In some cases and based on potential growth, prescriptions may be for active retainers, such as maxillary splinters for Class II malocclusions and mandibular positioners for Class III malocclusion.
4. The maintenance of periodontal health is important in all cases. However, in adult patients that presented bone loss before orthodontic treatment, the use of retainers of greater or lower stability and durability should be carefully analyzed before prescribing.

2) Do you believe the results of this study would be the same if conducted elsewhere, in other Brazilian states?

The prescription of a specific type of retainer is often affected by the place where the orthodontist was trained, whether in Brazil or abroad. However, based on the quality of the clinical cases published in the main Brazilian journals in the area of orthodontics, such as the Dental Press Journal of Orthodontics and Facial Orthopedics and the Revista Ortodontia SPO, we conclude that orthodontists have been selecting adequate retainers despite regional differences.

3) How do you explain the fact that most orthodontists prefer the Begg retainer for the maxillary arch and the 3-3 fixed lingual retainer for the mandibular arch?

Mandibular fixed retainers (3-3 wire) are extremely efficient, highly esthetic, and they do not impair speech and mastication significantly. In addition, when guidelines are clear, patients clean the area satisfactorily and, thus, avoid caries and gingival inflammation. The maxillary Begg retainers adapt well to the teeth and palate and do not affect dental occlusion. Some of their inconveniences are the poorer esthetic result and their negative effect on speech and mastication. Therefore, it should be used full time only for a short period and overnight for long-term. The adaptation to maxillary fixed retainers is difficult due to the occlusal contacts on the lingual surfaces of incisors, and the Hawley retainers also affect occlusion.