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Angle Class I malocclusion with congenitally missing and retention of mandibular second premolars*

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Abstract

This article reports the orthodontic treatment of a 14 year and 6 months old patient that had a Class I malocclusion with an ectopic position and retention of the tooth 45. This case was treated the extraction of the tooth 45 and space closure in the lower arch. Initial, final and post-treatment orthodontic records will be presented and discussed. This case was presented to the Brazilian Board of Orthodontics and Facial Orthopedics (BBO), category 7, free choice, as part of the requirements of achieve the title of BBO diplomate.

Keywords: Angle Class I Malocclusion. Tooth Retention. Congenitally Missing Tooth. Corrective Orthodontics.

HISTORY AND ETIOLOGY

The 14 years old patient presented himself for an initial consultation in good general health, reporting allergy sinus and nasal-oral breathing. He did not report any history of serious illnesses nor trauma. He was in the decelerating phase of the pubertal growth spurt curve and his dental history reported deficient oral hygiene and the presence of marginal gingivitis. His main complaint was the edentulous inferior spaces and the orthodontic treatment was prescribed by his dentist. The patient had not had any orthodontic treatment until this moment.

DIAGNOSES

The patient presented a Class I skeletal pattern with ANB of 1° (SNA=81° and SNB=80°) and increased FMA and Y axis values in relation to Steiner and Down analysis (FMA=31° and Y axis = 64°). This information can be seen on Table 1.

The dental features can be observed in Figures 1 and 2. The patient had a dental Class I relationship with problems (spaces) located in the inferior second premolars region, lower medium line deviation of 1mm to the left, 1mm anteroinferior crowding, 2mm overjet, 3mm overbite and the following teeth (15, 25, 22, 23 and 31) were rotated.

In the facial evaluation, the subject had a slight labial protrusion with lower lip ahead of the upper lip (UL=1mm and LL=3.5mm). He had passive lip sealment, a slightly enhanced lower facial third and no evident asymmetries nor mandibular functional deviation (Fig. 1).

* Case report, category 7, free choice, approved by the Brazilian Board of Orthodontics and Facial Orthopedics (BBO).
The radiographic evaluation revealed the absence of teeth 35 and 45 and the root resorption of tooth 46 (Fig. 4, 5). Previous panoramic radiographs indicated prolonged retention of teeth 75 and 85, ectopia and cystic lesion in tooth 45 that was later diagnosed as fibroameloblastoma (Fig. 3), upper teeth roots with incorrect axial inclinations and the presence of third molars. The hand and wrist radiograph showed advanced stages of calcification of the phalanges and wrist bones, and the presence of the sesamoid bone (Fig. 6). The lateral radiograph and cephalometric tracing (Fig. 7) revealed a balanced facial growth, clean upper airways, buccal inclined incisors and a straight facial profile. The cephalometric values are presented in Table 1.

**TREATMENT GOALS**

The goal was to maintain the vertical, transverse and anteroposterior pattern of both jaws. In the upper jaw, the main objective was to level, align and stabilize the teeth for latter use as anchorage unit for Class II elastic mechanics. The specific goal for the lower dentition was mesial...
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FIGURA 2 - Initial dental cast.

FIGURA 3 - Panoramic radiograph previously to the orthodontic appointment.

FIGURA 4 - Initial panoramic radiograph.

FIGURA 5 - Periapical radiographs of anterior superior and inferior teeth and left and right bitewings radiographs.
movement of molars, leveling of Spee curve, the maintenance of lower canine distance and improvement of the overjet and overbite. Therefore, by the end of the treatment, a molar Class III and cuspid Class I relationship was to be obtained. The patient rejected the orthodontic treatment proposal of maintaining the spaces for further implants and prosthetics of teeth 45 and 35. Hence, the treatment plan of totally closing the spaces in the region was chosen.

TREATMENT PLANNING

In order to achieve the treatment goals, the patient was informed about the treatment plan which consisted of upper and lower Edgewise appliance, 0.022” x 0.028” slot and 0.014”, 0.016”, 0.018” and 0.020” stainless steel arches for leveling and aligning. From the 0.020” arch, chain elastic were to be used in order to move mesially the lower molars, keeping the anterior teeth tied-together. Later, this movement would be continued with 0.018” x 0.025” arch and, if necessary, Class II elastics (force magnitude of 180g) would be installed in both sides. For finalization, it was planned the use of 0.019” x 0.026” in both jaws with individualized bends according to the patient’s need. After the active treatment end, a removable appliance (wraparound) made of 0.032” stainless steel wire and a lingual arch bonded to the lower cuspid teeth made of twisted 0.032” wire would be used. The extraction of the upper third molars as well as the bonding of a wire segment in the buccal faces of teeth 46 to 44 and 36 to 34 was not discarded. The patient was formally informed of the needed care of his orthodontic appliances as well as his oral hygiene.

TREATMENT PROGRESS

Orthodontic bands with welded accessories were made for the upper and lower molars. The other teeth were bonded with 0.022” x 0.028” edgewise brackets.

Sequential arches form 0.014” to 0.020” were used for leveling and aligning of both upper and lower teeth. In the lower arch, with 0.020” wire, all anterior teeth as well as both bicuspid were tied-together and the molars were mesialized with the aid of chain elastic. This mechanic was sustained in the 0.018” x 0.025” stainless steel wire. Class II elastics (180g) were used to aid the an-
chorage loss in both sides. After the lower spaces were closed the case was finalized with 0.019” x 0.026” arches in both jaws.

After all treatment goals were obtained, the fixed orthodontic appliances were removed and the retention phase was initiated. A removable appliance (wraparound) made of 0.032” stainless steel wire and a lingual arch bonded to the lower cuspid teeth made of twisted 0.032” wire were used. The upper appliance was to be used 24h a day during the first year and to sleep for following year. The lower arch was to be used indeterminately.

**TREATMENT RESULTS**

The patient’s final records evaluation (Fig. 8-12) show that the primary goals were achieved. The maxilla was kept in its position and the upper incisors were slightly retracted. The lower molars were moved mesially and their distance decreased from 46.5mm to 43mm, while the intercanine...
FIGURE 9 - Final dental cast.

FIGURE 10 - Final panoramic radiograph.

FIGURE 11 - Final periapical radiographs of anterior superior and inferior teeth and left and right bitewings radiographs.