

Crowding and protrusion treated by unusual extractions



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Abstract

A 16-year-old male with Class II malocclusion, anterior open bite, crowding and labial inclination of incisors with the treatment plan for avoiding upper premolars extraction because of bad conditions of first upper molars. The choice was four extractions and specifically upper first molars and lower first premolars. TADs were used in mesial area of upper second molars and applied usual sliding MBT mechanics with lacebacks and posted/tie-backs. In upper arch the tie-backs were from head of TAD to hook of wire, in order to allow the exclusive movement in distal direction of upper anterior teeth. Once the canine Class I is obtained, the TADs have been unscrewed, and the tie-backs anchored to the molar tubes. Sliding is achieved without difficulty and the case – after a brief period of occlusal settling – was completed in 19 months.

Introduction

The use of extractions in an orthodontic treatment is generally due to the absence of space and the obtainment of canine and molar keys. The teeth that are most frequently subjected to extractions are the premolars. However, on some occasions it's convenient to extract other teeth, for example teeth with destructive caries, with root canal treatments, impacted or with compromised periodontium. Choosing unusual extractions is made easier by good anchorage control due to the widespread use of TADs. Furthermore, it is necessary to associate efficient brackets that allow sliding biomechanics to provide low friction and resistance to breakage and detachments.

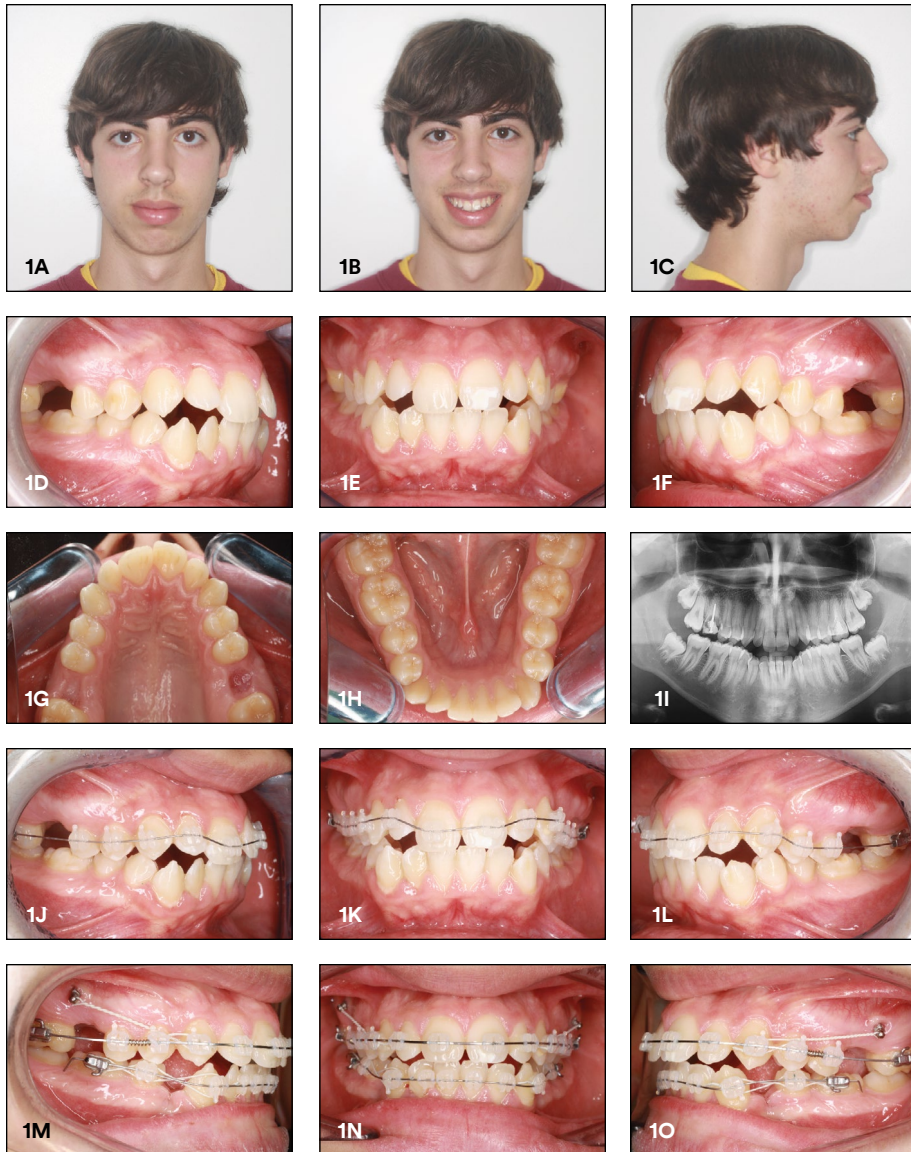


Figure 1A-O

Case Report

The case shown is a 16-year-old male with Class II skeletal characteristics and Class I dental relations. The intraoral clinical description is completed with crowding, incisors protrusion, negative overbite, positive overjet, upper compromised first molars and, in extraoral aspect, labial incompetence and back position of the chin. The analysis of space and the evaluation of the profile suggest for an extractive treatment and, despite the initial choice about the extraction of four first premolars, it has been decided to sacrifice the first upper molars and the first lower premolars. This idea requires great attention to anchorage control and for this reason it is established that two TADs will be used in the buccal area mesially to the second upper molars.

Two weeks after the first molars were extracted, the 3M™ Clarity™ Advanced Brackets using the 3M™ MBT™ System prescription were applied in the upper jaw in combination with a 0.014" NiTi SE archwire. No laceback was applied to avoid unwanted mesialization of the second molars. The extractions of first lower premolars were performed within two weeks of upper bracketing, but no braces were applied to allow distal driftodontics of canines. At the fourth month, the braces were also applied in the lower arch in combination with lacebacks and archwire 0.014 NiTi SE; in the meantime, in the upper arch, the sequence was 0.016 NiTi SE and 0.017"×0.025" NiTi with tie-back from TADs to canines to anchor them and open coil spring between first and second premolars. The open coil spring causes a desired action on the second premolar which can distalize and the unwanted reactive force is neutralized by the tie-back.

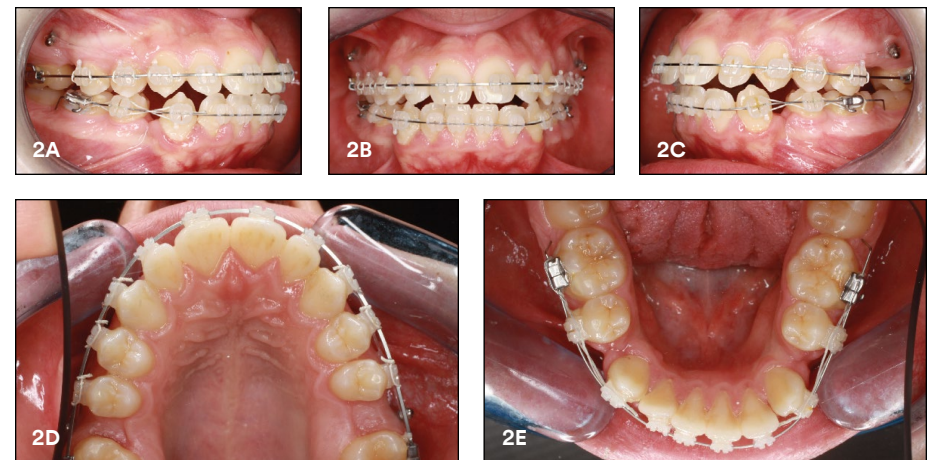


Figure 2A-E

At the sixth month, the second premolar reached the final position with the palatal cusp in contact with the central area of the mesio-distal sulcus of the first lower molar; the closure of the extractive space, already partially realized for spontaneous movement, continues thanks to the laceback in esthetic coated wire 0.012". The backward movement of the other upper dental elements takes place with an elastic long chain connecting the TADs to the canines, while the premolars are tied by preformed coated 0.012" ligature to reduce friction. The long chain is pulled as little as possible, to avoid canine's negative tip and bowing effect on the arch. The incisors follow the distal movement of the canines through the pressure of the lip.

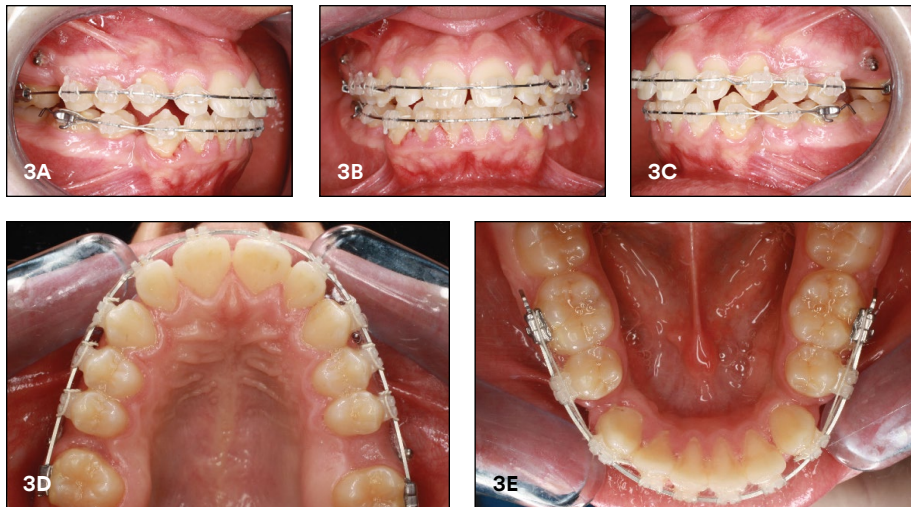


Figure 3A-E

In the seventh month, the lower spaces are reduced to about 2 mm per side and the biomechanics continues with laceback and 0.017"×0.025" NiTi HA archwire. In the upper arch, instead, a long elastic chain connects the TADs to all six anterior teeth, while a step-up using archwire 0.017"×0.025" NiTi HA compensates for the possible bowing effect and the reduction of incisors' inclination.

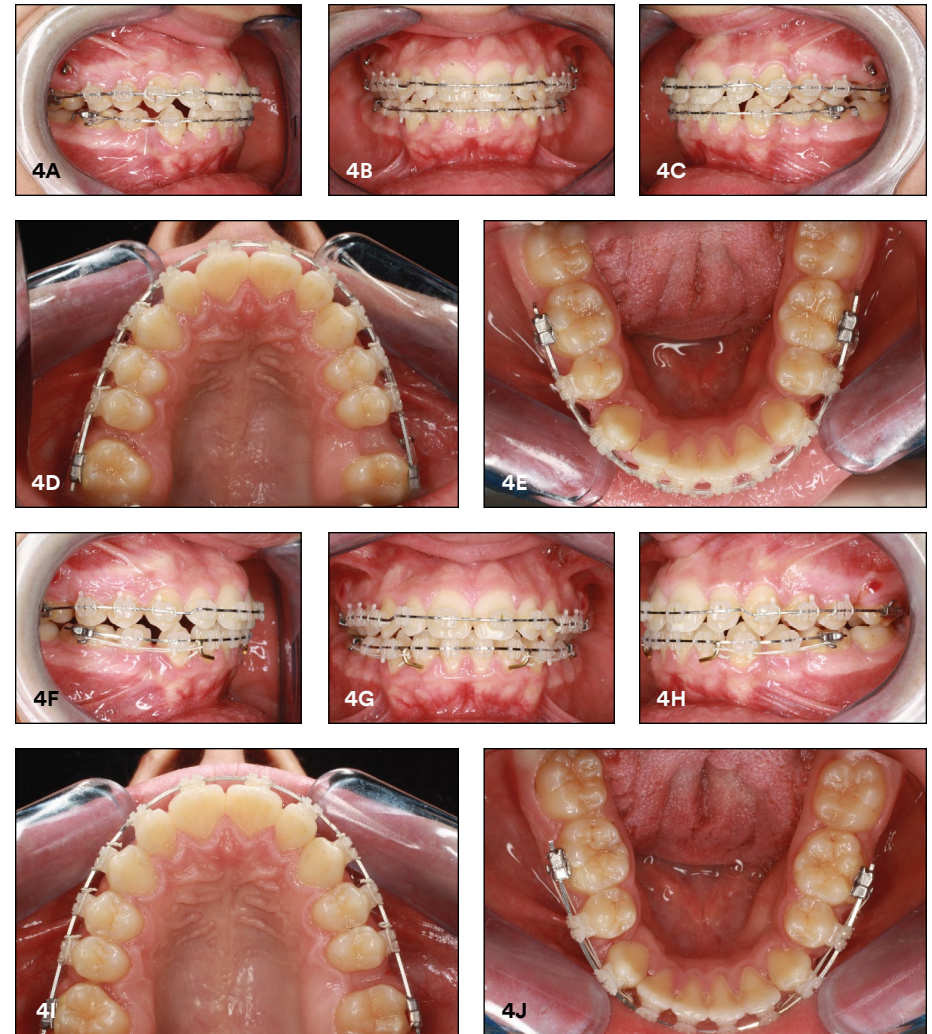


Figure 4A-J

At the eighth month, a 0.019"×0.025" posted archwire, with classic passive Teflon coated 0.012" wire tie-backs, is applied in the lower arch. In the upper arch a 0.019"×0.025" NiTi Super Elastic archwire with step-up on the incisors and bend backs to maintain the arch length during leveling and anterior torquing. Both miniscrews (Ortho Implant, 8 mm) are removed because they have finished their function. Having sped up the closure of the spaces compared to the usual MBT method, at this point it is necessary to, as they say, let it cook.

In the 10th month, a posted archwire 0.019"×0.025" is also applied in the upper arch, and also on this thread the step-up is done: the alternative would have been to reposition the braces on the incisors. At the same time the patient applies intermascellar Class II elastics (3/16", 6 oz), to improve the molar and canine keys. In both arches, elastic tie-backs are present to close the remaining extraction spaces.

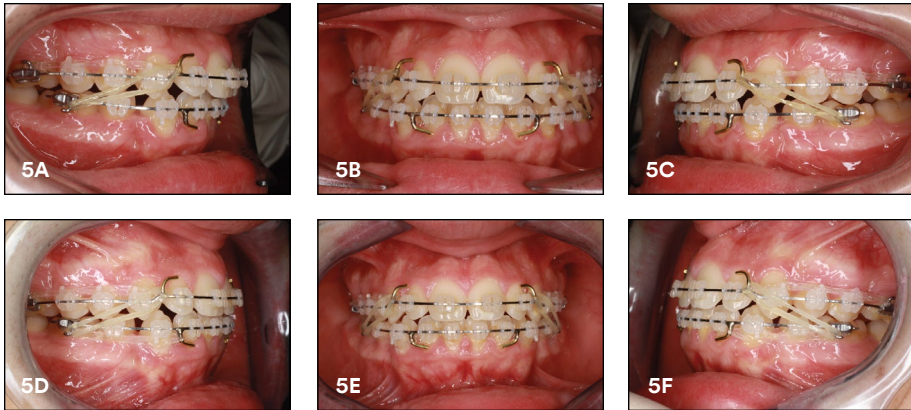


Figure 5A-F

At the 13th month, we are in the finishing phase: in the lower arch we recapitulate by applying again an 0.017"×0.0125" NiTi HA archwire, on which we can model second order bends on the right side to obtain the occlusal landing. To achieve this, a 1.5 mm step plier was used. The lower second molars are excluded on the device because they show a good alignment with a good coincidence of the marginal ridges.

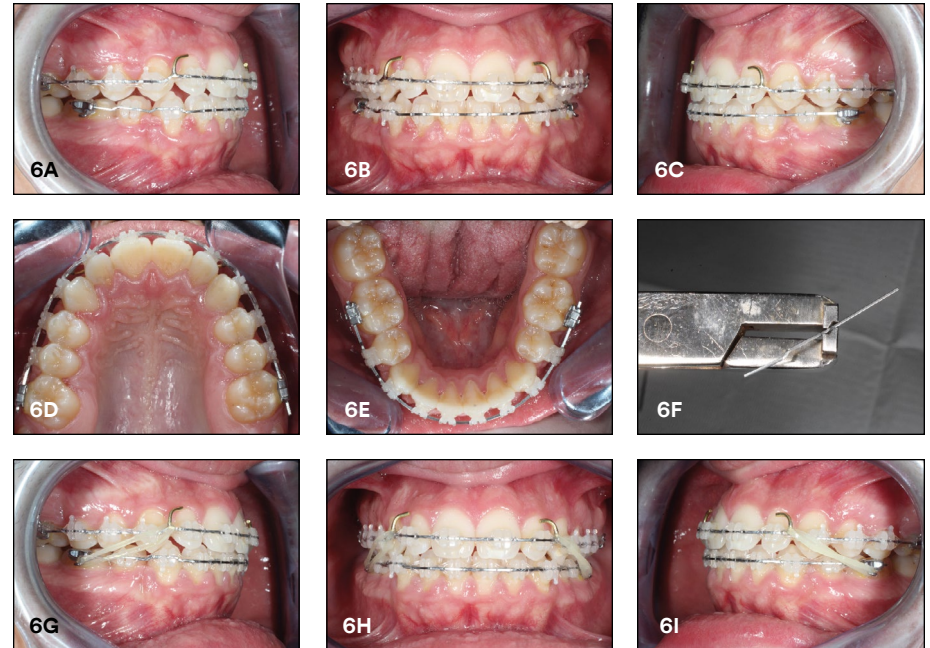


Figure 6A-I

Conclusions

The treatment is carried out in a very short time for an extractive case in which some of the extractive spaces correspond to about 10 mm.

The total duration of the treatment was 16 months, with a final result that is characterized by a good Class I canine relationship, a desired hyper Class III molar, coincidence of the midlines, good control of the incisor torque and consequent good support of the lips and functional labial competence.

During the treatment, there were only two detachments of molar tubes and a bracket of the second right lower premolar, no breakage and the closure of the spaces in sliding mechanics occurred without delay to the apparent and usual speed of about 1 mm per month. The choice to exploit driftodontics initially proves to be effective especially in cases of protrusion and crowding where labial pressure can be exploited; moreover, the choice of extracting the upper molars allowed not to disturb the smile for a long period – considering the “social moment” of the teen patient. In the meantime, the third molars have found space to make their appearance in the arch. To conclude, it should be pointed out that without the skeletal anchorage, obtained with two 8 mm mini screws, we would not have been able to distalize five teeth per side leaving the second molars in the initial position.

References

1. Effects of first molar extraction on third molar angulation and eruption space. M.Bayram, M.Özer, S.Arici. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology,. Volume 107, Issue 2, 2009, Pages 14-20
2. Upper Canine Extractions in Adult Cases with Unusual Malocclusions. G.Fiorillo, F.Festa, C.Grassi. Journal of clinical Orthodontics. Feb 2012, Pages 102-110
3. Stability of anterior open-bite extraction and nonextraction treatment in the permanent dentition. G.Janson, F. Pinelli Velarelli, R.Targino Beltrao, M.R.de Freitas, J.F.Castanha Henriques. American Journal and Dentofacial Orthopedics, Volume 129, Issue 6, June 2006, Pages 768-774
4. A cost-effectiveness analysis of anchorage reinforcement with miniscrews and molar blocks in adolescents: a randomized controlled trial. Ni. Ganzer, I. Feldmann, S. Petré, La. Bondemark. European Journal of Orthodontics. June 2018

Case photos provided by Dr. Gianluigi Fiorillo.

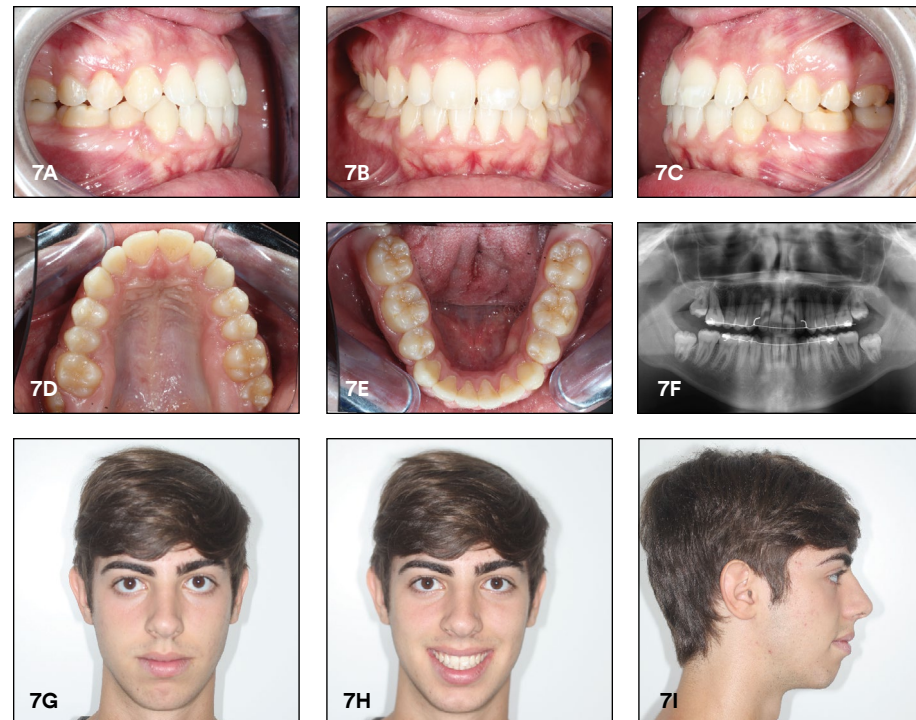


Figure 7A-I