



# A PROPOSAL OF A NEW FUNCTIONAL APPLIANCE SUPPORTED BY SKELETAL ANCHORAGE

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**INTRODUCTION.** Orthopedic treatment of third-class in growing patients with palatal expander and facemask is the gold standard approach to resolve malocclusion from maxillary retrusion<sup>1</sup>. To limit the dental-alveolar effects and to maximize the skeletal advancement, several Authors have proposed the use of a **mixed-anchorage RPE**, skeletal and dental supported<sup>2</sup>. Maino et al. have developed a system of digital planning for the guided insertion of palatal miniscrews, thanks to an high precision surgical guide<sup>3</sup>.

At the end of the orthopedic phase, to keep the skeletal result reached, the use of a removable functional appliance is recommended. The most common appliances, such as the Frankel III and the Reverse Bionator, are effective but very bulky, they alter the phonation and the compliance is difficult<sup>4</sup>. They do not allow to improve the dental alignment. For this reason the Postgraduate School in Orthodontics of Ferrara recently proposed the use of the Runner, which is an aesthetic functional aligner with digital setup, according to the principles of the Reverse Twin Block of Clark<sup>5</sup>.

**THE AIM OF THIS STUDY** is to describe the case report of a Class-3 patient treated in **orthopaedic phase** with a mixed-anchorage RPE (skeletal and dental supported) and Petit Mask, and in **functional phase** with the Class-3 Runner supported by a single palatal miniscrew.

**CASE REPORT.** The patient LG, 8 years old, is affected by hypodivergent skeletal class III malocclusion, molar class 2 relationship and retroclined lower incisors (Figure 1).



Figure 1



For the orthopaedic phase, the precise directional positioning of two palatal miniscrews was planned with the aid of cone-beam computed tomography (CBCT) images and digital casts (Figure 2). Liou's Alt-RAMEC protocol was followed with 6 months of Petit Mask use.

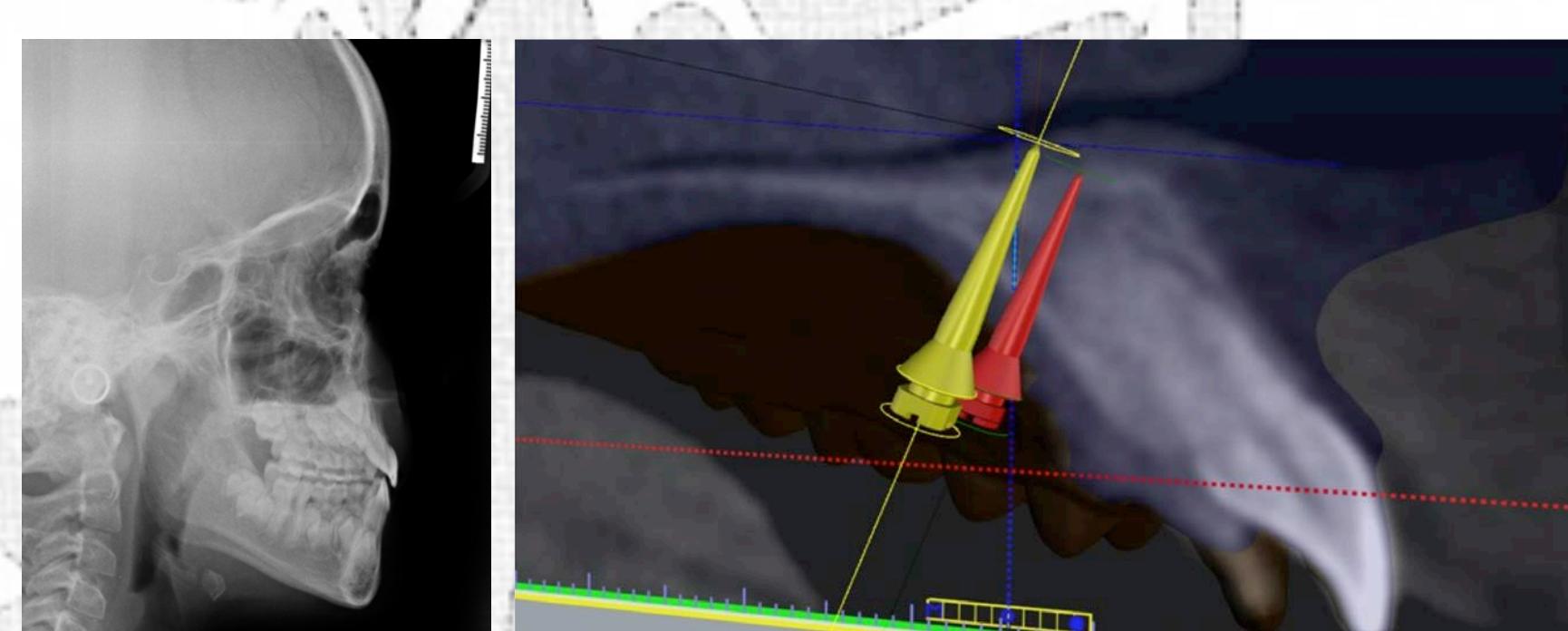


Figure 2

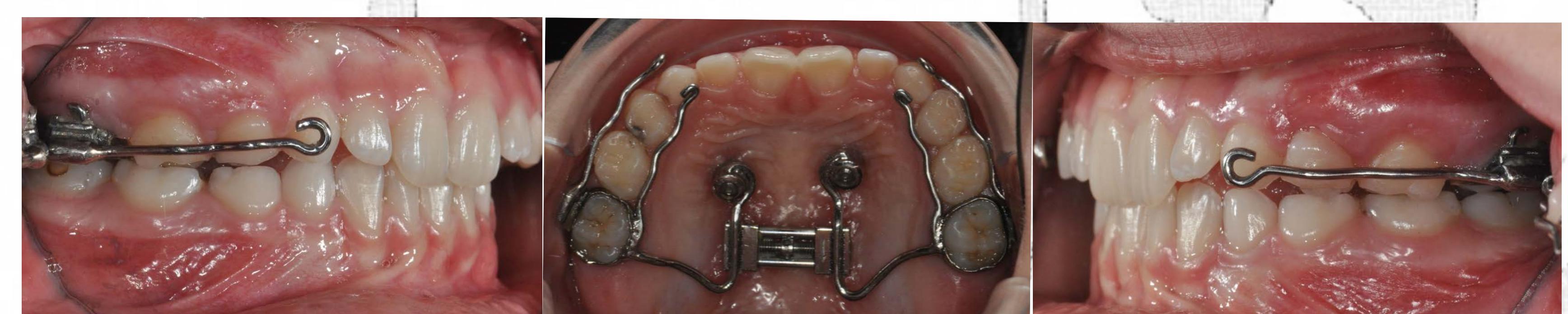


Figure 3

At the end of the orthopaedic phase, the patient presents an improvement of the skeletal transversal and sagittal relationship. As the shape of the upper arch is not adequate, the upper incisors are lingually inclined and the lower are slightly misaligned (Figure 3).

For the functional maintenance of the sagittal correction, five Runner-3 steps were planned, in order to align the upper and the lower incisors at the same time. The upper aligners were extended to incorporate the palatal miniscrew, inserted during the orthopaedic phase, to maximize the fitting of the aligners (Figure 4).



Figure 3.

**RESULTS.** After 4 months of use, the sagittal iper-correction was maintained, and the archform was improved, as planned in the digital setup. The compliance was excellent thanks to the aesthetics and the thinness of the Runner-III appliance, which make the appliance hardly visible (Figure 4).



Figure 4.

**CONCLUSIONS.** The Class-III Runner can be used as functional retention after the orthopaedic treatment to improve the incisor alignment. The skeletal anchorage can be used to improve the stability of the upper aligners and to obtain the planned dental setup aims.

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