

# Orthodontic Mini-Implants Hybrid Expanders in Palatal Expansion

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*The purpose of this case report is to evaluate the role of mini-implants hybrid expanders in the orthodontic treatment of narrow maxilla. A female patient with a skeletal asymmetry and unilateral posterior crossbite presented for orthodontic treatment. Digital records were sent to the orthodontic laboratory. The orthodontic lab made the mini-implants hybrid expanders and a 3D surgical guide for an accurate insertion of the mini-implants. After two months, a successful expansion of the maxilla was obtained. Orthodontic mini-implants hybrid expanders could eliminate surgical treatment in many narrow maxilla cases.*

*Keywords: hybrid expander, orthodontics, rapid palatal expansion*

Maxillary transversal development has always been a major problem in orthodontics, leading to unilateral or bilateral crossbites, facial asymmetries, breathing and swallowing deficiencies [1,2]. Throughout the years many orthodontists have used rapid maxillary expansion (RME) in order to correct maxillary constriction. [3] Appliances and treatment protocols used in the past rely mostly on posterior teeth for anchorage [4,5]. Due to the high orthodontic forces needed to open the maxillary suture, complications such as secondary tooth movement, resorption of the root or alveolar bone could occur when using classic RME appliances [6]. Nowadays, along with the progress in the field of bone anchorage orthodontic components, the use of hybrid RME appliances is starting to become widespread. Using cone beam computed tomography (CBCT) as a tool to accurately predict the height and density of the palatal bone, either two or four mini-implants are positioned in the palate [7]. In our study we used a hybrid palatal expander that used the bone anchorage of two palatal orthodontic mini screws and tooth anchorage of the first maxillary molars. Our aim was to evaluate the role of this type of expander in the treatment of a narrow maxilla.

## Experimental part

### Materials and method

A female patient aged 23, presented herself to our clinic for an orthodontic consult. Initial observations revealed facial asymmetry, lip incompetence, a narrow maxilla and a unilateral crossbite on the right side (fig. 1).



Fig. 1. Intraoral photographs of the patient

After a full evaluation of the case and orthodontic treatment planning, the decision for the first stage of treatment was to address the maxillary constriction. Given the age of the patient, surgical intervention followed by classic RME with tooth borne appliances would be the first choice. In order to avoid the surgical intervention and decrease treatment time, the decision to use a hybrid orthodontic expander was taken. A cone beam computer tomography (CBCT) was taken with CRANEX 3D (Soredex, Finland) in order to obtain a 3D model of the palatal bone of the patient. An intraoral 3D scan with TRIOS 3SHAPE system (provided by Dentcof Clinic, Timisoara) was needed for the appliance fabrication process. Both the CBCT and intraoral scan were sent to the orthodontic laboratory by digital transfer.

We received the mini-implants hybrid expander and also a 3D surgical guide for an accurate insertion of the mini-implants (fig. 2). Insertion of the mini-implants was done at the same time with the bonding of the appliance (fig. 3).

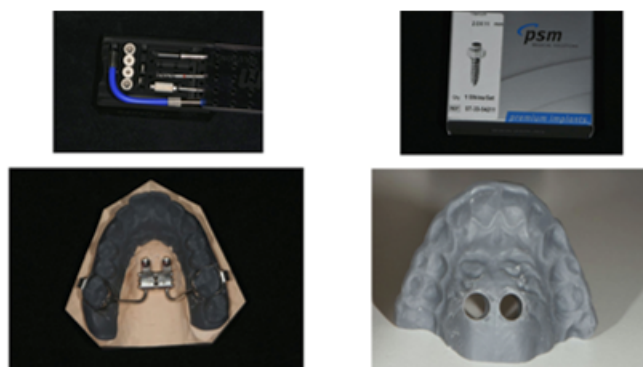


Fig. 2. Insertion burs, mini-implants, hybrid expander on 3D printed model and 3D printed surgical guide

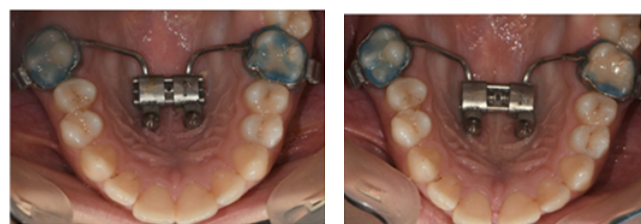


Fig. 3. Intraoral photographs after appliance insertion

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## Results and discussions

After two months of daily activation, a successful expansion of the maxilla was obtained. Opening of the maxillary suture was evident by the appearance of a 3 mm midline diastema. Bone borne RME appliances are more effective than tooth borne expanders, but at the same time stresses in the upper jaw are increased when hybrid expanders are used [8]. Rapid palatal expansion can significantly increase both the maxilla and nasal cavity and using hybrid expanders can lower the dental and periodontal side effects of classic rapid transversal expansion appliances. [9-11]

## Conclusions

Orthodontic mini-implants hybrid expanders could eliminate surgical treatment in many narrow maxilla cases.

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