Non-surgical rapid maxillary expansion in adult patient: Report and review
Thiago Fonseca-Silva¹, Ângelo Fonseca-Silva², Raquel Gonçalves Vieira-Andrade¹, Carolina Carvalho de Oliveira Santos¹

¹Department of Dentistry, School of Dentistry, Faculdade Leão Sampaio – FALS, Juazeiro, Ceará, Brazil, ²Department of Dentistry, School of Dentistry, Faculdades Integradas do Norte de Minas - FUNORTE, Brazil

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Abstract
Maxillary transverse deficiency in adults is a malocclusion of relative high prevalence in orthodontics. The rapid maxillary expansion (RME) surgically assisted is considered the preferred procedure to correction of this alteration in patients skeletally mature. Evidences indicate that rapid palatal expansion may be used without surgery in young adults. The purpose of this paper was report a case of the RME without surgery in a 19-year-old female adult. The palatal expansion was accomplished by means of a Hyrax device with post-treatment radiographs revealing an opening of the midpalatal suture.

Introduction
The transversal discrepancy between the dental arches is one of the most frequent malocclusions in orthodontics.¹ Premature loss of deciduous teeth, crowding, genetic factors, arch deficiencies, abnormalities in tooth anatomy or eruption sequence, oral digit habits and buccal respiration during critical growth periods configure important etiological factors for this malocclusion.²,³

The rapid maxillary expansion (RME) is the treatment indicated for the transverse maxillary deficiencies and is realized through midpalatal suture opening.⁴ The correction of transverse discrepancies and the gain in arch perimeter appear to be the important effect of this treatment.⁵

Maturation level of the patient is an important point when considering the effects of the RME on craniofacial structures.⁶ The literature described that maxillary sutures close around 14-15-year-old in females and 15-16-year-old in males.⁶,⁷ Based on the maturation of palatal suture, the non-surgical RME treatment has been considered a successful in children and adolescents because their palatal suture is not closed.⁸,⁹ In adults, the surgically assisted RME is the main alternative for treatment to transversal maxillary discrepancies. However, complications of the surgical procedure and financial cost can be difficulties in the adult patients treatment.¹⁰,¹¹

In the last years, the non-surgical RME has been identified as another possibility for treatment skeletally mature patients.¹² The aim of the present study is report a case of non-surgical RME in the 19-year-old female adult patient.

Case Report
A 19-year-old female was referred to orthodontic treatment. A clinical examination and orthodontic records revealed skeletal and dental Class I malocclusion, bilateral crossbite with a skeletal deficiency in the transverse dimension of the maxillary arch and negative deficiency in maxillary and mandibular arch perimeter [Figure 1].

The patient was informed about the possibility of surgically assisted RME for correction of maxillary changes because she was adult and her palatal suture had already established. All details about this procedure were informed to the patient, however, she had concerns regarding this approach and refused the surgical option. It was decided that non-surgical (RME)
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should be performed before placing full fixed orthodontic appliances. The patient was informed of all possible sequelae, risks, and benefits of this therapy, including the possibility of unsuccessful treatment.

Clinical measurements of transversal discrepancies were performed on maxillary and mandibular arch with a paquimeter. The expansion measured for correction of maxillary deficiency was approximately 8 mm. A maxillary Hyrax appliance was installed, and the patient was instructed to turn the screw twice a day for 3 weeks [Figure 2]. About 5 days of appliance activation, it was observed the expansion in the maxillary arch perimeter. After ten days, the expansion measured was 10 mm, and the patient presented a midline diastema of approximately 4 mm. An occlusal radiograph was taken to verify if the midpalatal suture had been opened [Figure 2]. The patient not related pain symptoms or mucosal changes during non-surgical RME.

The bilateral crossbite was treated and skeletal deficiency transverse of the dimension of the maxillary arch was corrected [Figure 3]. A stainless steel ligature was placed through the expansion screw to fixate its position. To allow osteogenic formation in the midpalatal suture, it was instituted a phase of retention of 4 months. After this time, the patient was referred to the treatment of crowding with fixed appliances.

**Discussion**

RME is a procedure that aims orthopedic and orthodontic treatment of transverse maxillary deficiency.[13] Due to RME be based on the profile of skeletal maturation, several studies suggest that this treatment is indicated to children and adolescents patients.[7,8] The literature described that non-surgical RME is contraindicated in patients older than 18 years because their palatine suture would be very difficult to open and often impossible, requiring surgery procedure for correction of transversal changes.[10,11,14] However, several authors had been related the possibility of non-surgical RME in young adult patients with the high successful index in the treatment of maxillary transversal discrepancies.[2,3,5,8,15]

The present case showed a procedure of non-surgical RME in the 19-year-old adult patient. The midline diastema emphasizing the skeletal effect of the Hyrax appliance and clinical success was judged by the evidence of the creation of a midline diastema. Capeloza Filho et al., described about the non-surgical REM in young adult patients as a very good possibility of maxillary expansion.[15] In their study, although non-surgical expansion may fail in some patients because of painful reactions, the rapid palatal expansion in younger adults was completed successfully. Other similar studies also support the use of non-surgical RME in young adults. A study showed the non-surgical maxillary expansion of 82 patients under the age of 25-year-old and all cases with successful.[3] Studies evaluating long-term stability have also produced encouraging results.[14,16] Northway and Meade, related the follow-up of 15 patients ranging in age from 15 to 39 for 11 years; none of the patients experienced a recurrence of their crossbite.[16]

The Hyrax or Hass appliances are the most common devices to use in non-surgical REM. The activation may be performed twice a day over a period of 21 days, and a real opening of the
midpalatal suture will be observed by occlusal radiography; after stabilization, the expander was maintained in position for 4 months, based on the osseous maturity of the patient.[2,15]

Conclusion
The non-surgical treatment of transverse maxillary deficiency seems to be a considerable possibility in younger adults. The orthodontist must decide for each individual adult patient whether it is best to expand its maxilla with non-surgical or surgical rapid palatal expansion. The decision of which approach to use in many different situations maxillary atresia is dependent on several factors, and none should be singly analyzed. There were two viable options of treatment greatly enhances the ability to treat maxillary arch deficiency cases.

References