

# *The use of MARPE for adult*

Dina hamid Obaid

- **Conventional rapid palatal expansion (RPE)** has been proven to be a reliable treatment for correcting transverse maxillary deficiency in young patients. However, side effects including dental tipping and risk of periodontal problem limited its application to young patients after the pubertal growth spurt.
- **Surgically assisted rapid palatal expansion (SARPE)**, a supplement to RPE, could be applied in skeletally mature patients. However, SARPE was an invasive method, and the morbidity, risks and cost related to surgical treatment might discourage many adult patients.

- **The use of Microimplant-Assisted Rapid Palatal Expansion (MARPE)** appliance, which can potentially avoid surgical intervention, is gaining popularity in treatment of maxillary transverse deficiency (MTD) in young adolescent patients.
- Even for adults, many clinical results shows the effectiveness of the active transverse correction by using MARPE.

# Maxillary transverse expansion in adults: Rationale, appliance design, and treatment outcomes



*Kee-Joon Lee, Sung-Hwan Choi, Tae-Hyun Choi, Kyung-Keun Shi, and Byeong-Tak Keum*

Balanced transverse relationship between maxillary and mandibular dentition is a prerequisite for establishment of normal occlusion regardless of patient's age. In particular, considering the high prevalence among adults, maxillary transverse deficiency does not appear to be diagnosed or treated properly possibly due to the lack of diagnostic measures and treatment modality. A center-of-resistance perspective of the transverse dimension may be helpful for the clinicians to understand the pattern and severity of discrepancy. In terms of treatment, non-surgical expansion of the maxillary

**it can be concluded that the non-surgical palatal expansion in young adults can be a useful modality exhibiting high success rate of suture separation and clinically acceptable stability following expansion. (Semin Orthod 2018; 24:52–65.) © 2018 Elsevier Inc. All rights reserved.**

**clinically acceptable stability following expansion. (Semin Orthod 2018; 24:52–65.) © 2018 Elsevier Inc. All rights reserved.**

## Prevalence of transverse problem in adults

Angle's classification of malocclusion is based on the relative position of maxillary and mandibular occlusal counterparts in the anteroposterior direction and has been widely in use in the orthodontic practice. In spite of the simplicity of defining malocclusion, however, the Angle's classification has its limitation in three-

dimensional description of jaw relation particularly in the vertical and transverse dimension. Andrews suggested six keys to normal occlusion, providing a specific condition of the conformation of normal denture relationship.<sup>1</sup> In terms of vertical relation, flattening the curve of Spee was described as an essential key to the normal occlusion.

Nonetheless, definition of adequate transverse relationship has been scarce in the orthodontic literature, possibly causing lack of understanding on the significance of transverse control. It is clear that obvious transverse discrepancies such as facial asymmetry, midline deviation, posterior crossbite and scissors bite, disrupt the occlusal relationship and hinder orthodontic correction into normal occlusion. Therefore, diagnosis of transverse relationship is as important as that of anteroposterior discrepancy. In this article, recent attempts to recognize and correct the

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## Systematic Review

# Efficacy of Miniscrew-Assisted Rapid Palatal Expansion (MARPE) in late adolescents and adults: a systematic review and meta-analysis

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Jan G.J.H. Schols<sup>1</sup> and Tong Xi<sup>3</sup>

## Conclusions

This systematic review demonstrated that MARPE is a successful treatment modality for maxillary expansion (mean success rate: 92.5%), inducing both skeletal (MD: 2.33 mm) and dental (MD: 6.55 mm) transverse maxillary expansion. These results are clinically comparable to the expansion achieved by SARPE. Furthermore,

\* \* \* patients with the age of 10 onwards with transverse maxillary deficiency who were treated with MARPE and which included any of the predefined outcomes.

**Data collection and analysis:** Inclusion eligibility screening, data extraction and risk of bias assessment were performed independently in duplicate. When possible, exploratory meta-analyses of mean differences (MDs) with their 95% confidence intervals (CIs) were conducted, followed by the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) analysis of the evidence quality.

**Results:** Eight articles were included: two prospective and six retrospective observational studies. One study had a moderate risk of bias, whereas seven studies had a serious risk of bias. GRADE quality of evidence was very low. MARPE showed a high success rate (mean: 92.5%; 95%CI: 88.7%–96.3%), resulting in a significant skeletal width increase (MD: 2.33 mm; 95%CI: 1.63 mm–3.03 mm) and dental intermolar width increase (MD: 6.55 mm; 95%CI: 5.50 mm–7.59 mm). A significant increase in dental tipping, a decrease in mean buccal bone thickness and buccal alveolar height, as well as nasal soft tissue change was present ( $P < 0.05$ ). The mean duration of expansion ranged from 20 to 126 days.

**Limitations:** One of the main drawbacks was the lack of high-quality prospective studies in the literature.

**Conclusions and implications:** MARPE is a treatment modality that is associated with a high success rate in skeletal and dental maxillary expansion. MARPE can induce dental and periodontal side effects and affect peri-oral soft tissues. Given the serious risk of bias of the

## Miniscrew-assisted rapid palatal expansion for managing arch perimeter in an adult patient

### CONCLUSIONS

The MARPE is a clinical effective technique for correction of transverse discrepancies in skeletal mature patients as it provides maxillary expansion at sutural levels and decrease dentoalveolar side effects. It should be considered as an alternative for managing arch perimeter length, especially in limited adult orthodontic treatments.

foi utilizada para a correção da relação de Classe II subdivisão direita, adequação do perímetro da arcada inferior e correção do desvio da linha média antes da inclusão dos incisivos centrais superiores. **Resultados:** os registros pós-tratamento demonstraram o aumento de 5,0mm na distância intermolares, relação bilateral de Classe I de molares e caninos, resolução do apinhamento superior e inferior, linhas médias dentárias coincidentes e intercuspidação adequada. **Conclusões:** a técnica MARPE é uma abordagem de tratamento efetiva para a resolução da deficiência de perímetro das arcadas dentárias relacionada à discrepância maxilar transversa em pacientes adultos.

**Palavras-chave:** Procedimentos de ancoragem ortodôntica. Técnica de expansão palatina. Adulto. Má oclusão.

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» The authors report no commercial, proprietary or financial interest in the products or companies described in this article.

» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

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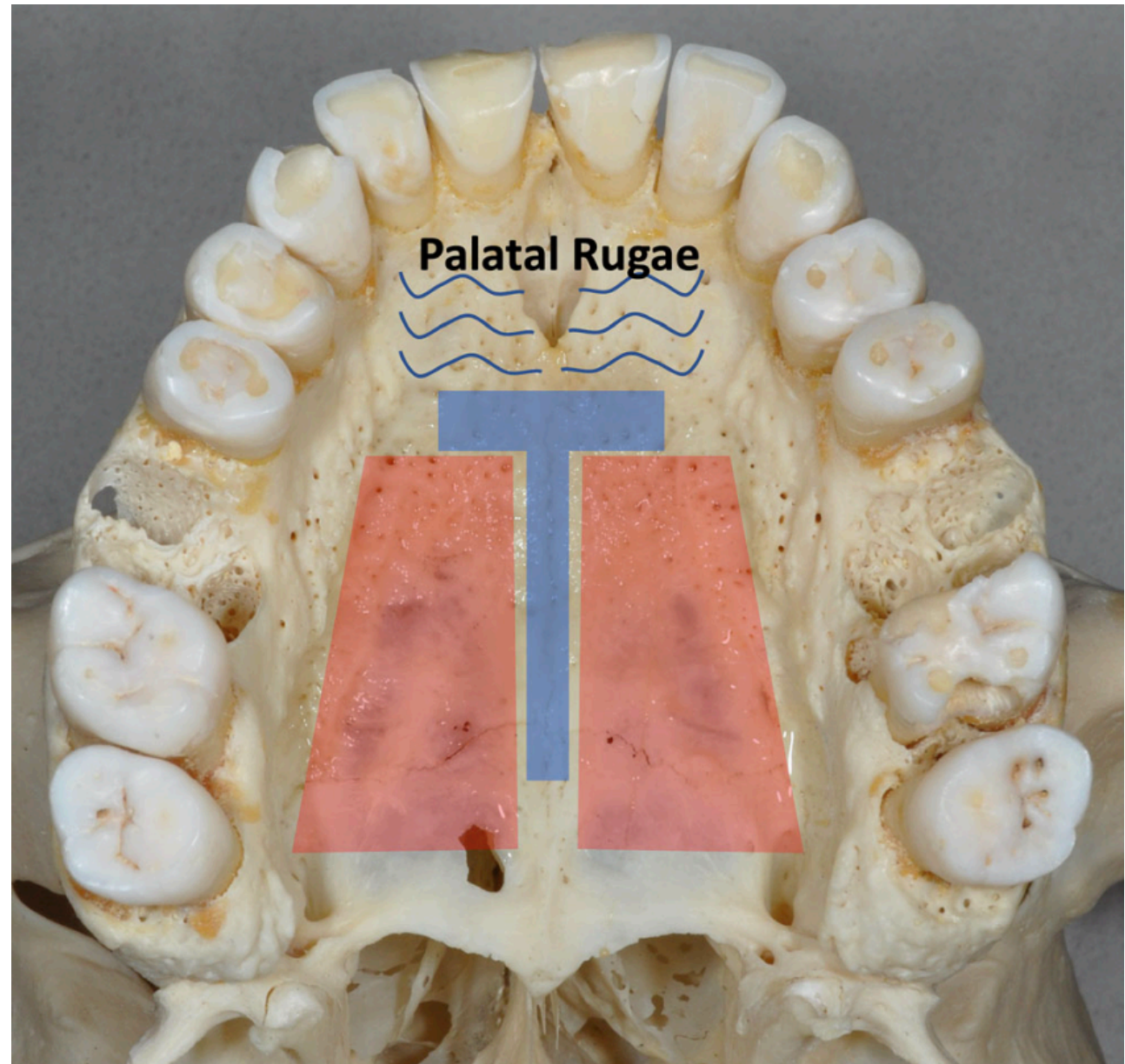


**Miniscrews**  
**1.8 x 11mm**  
**1.8 x 13mm**  
**SS**

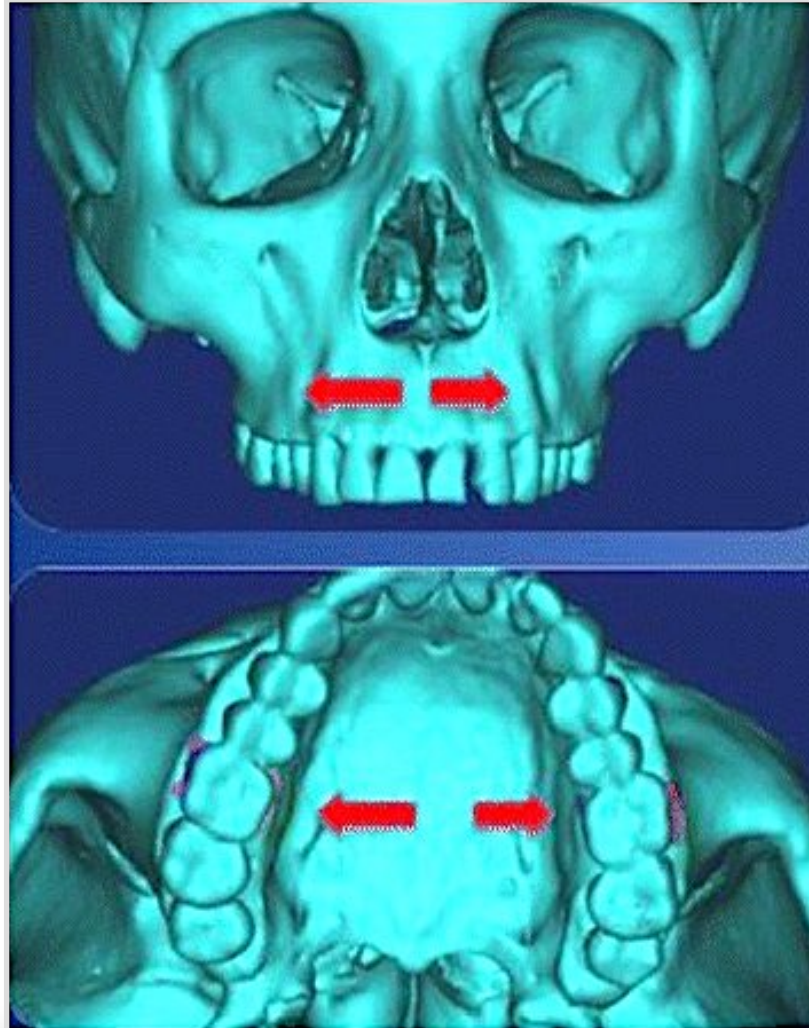


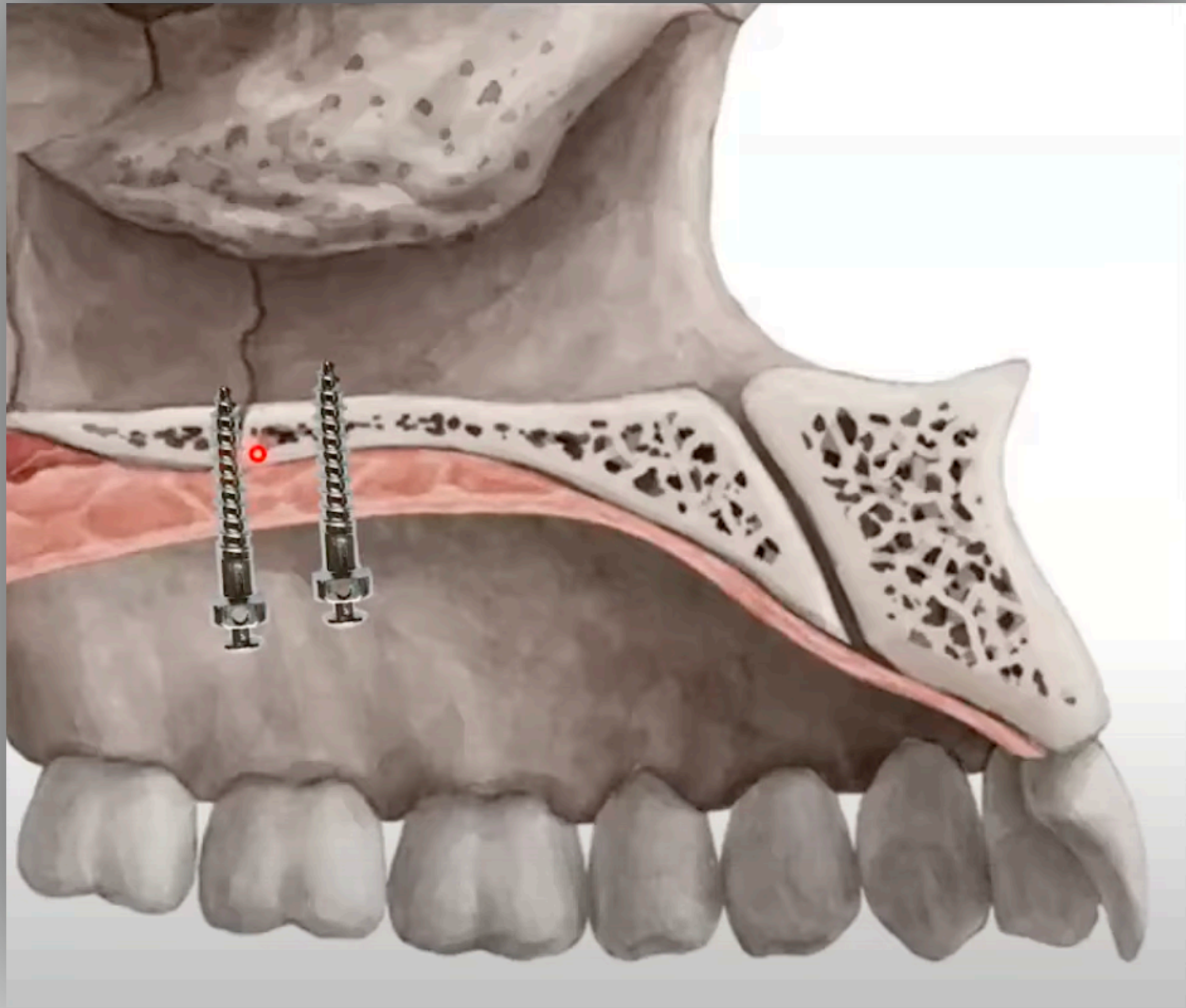


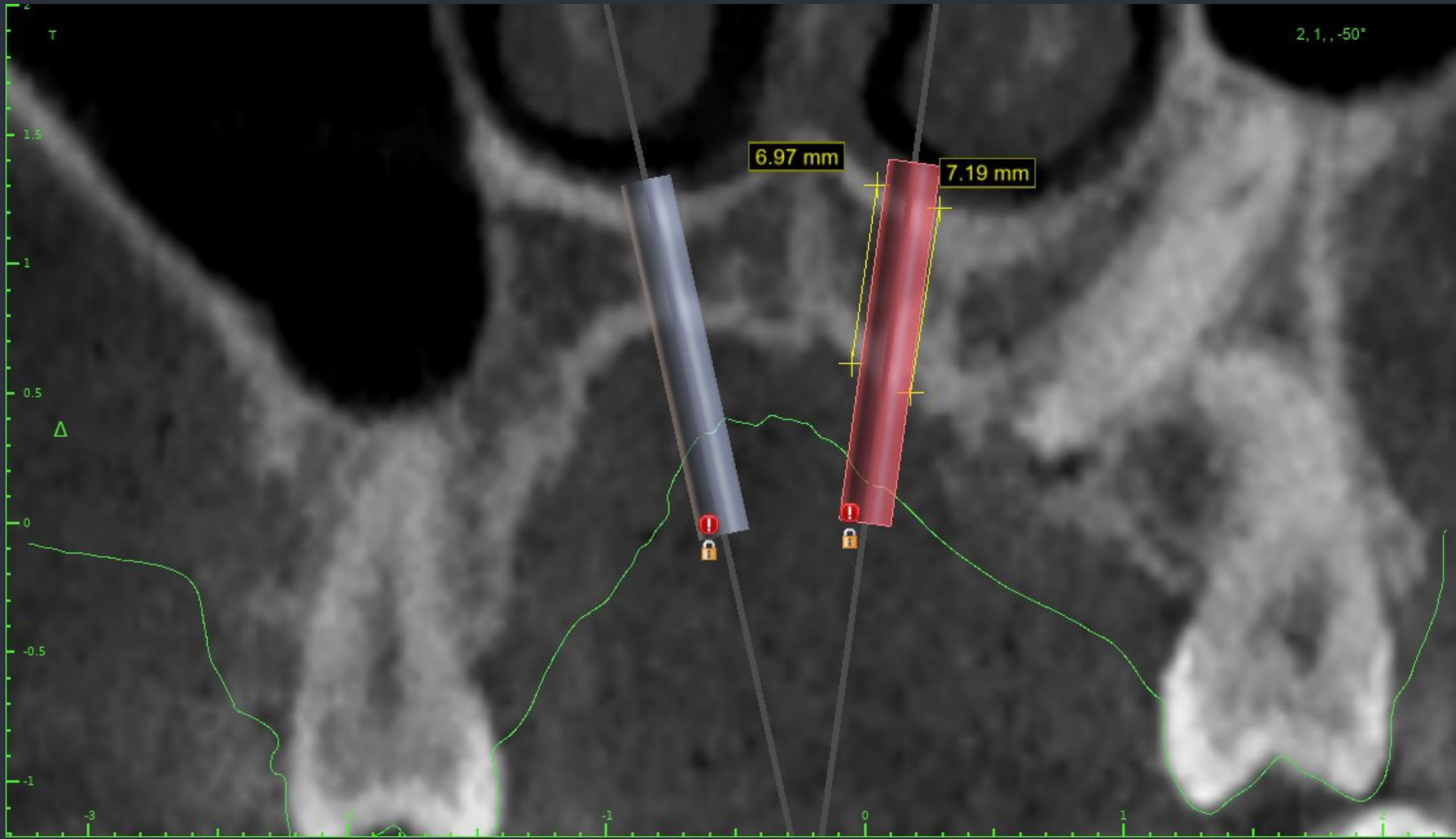
The anterior palate offers an outstanding amount and quality of bone, particularly an area distal to the third rugae extending medially toward the bicuspids and over the midpalatal suture posteriorly. Clinicians refer to this area as the “**T-Zone**”.



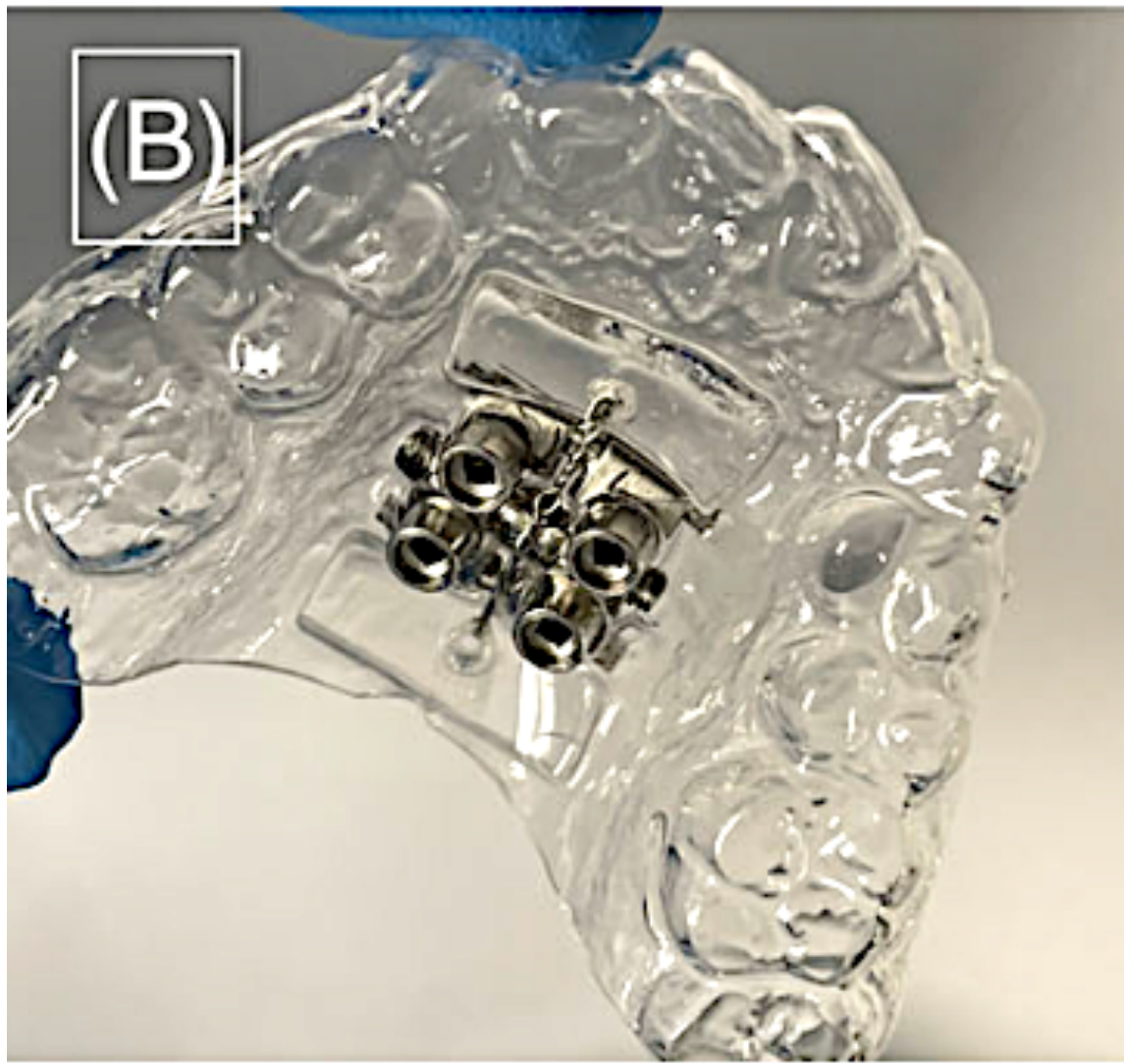
## Principle of expansion by MARPE



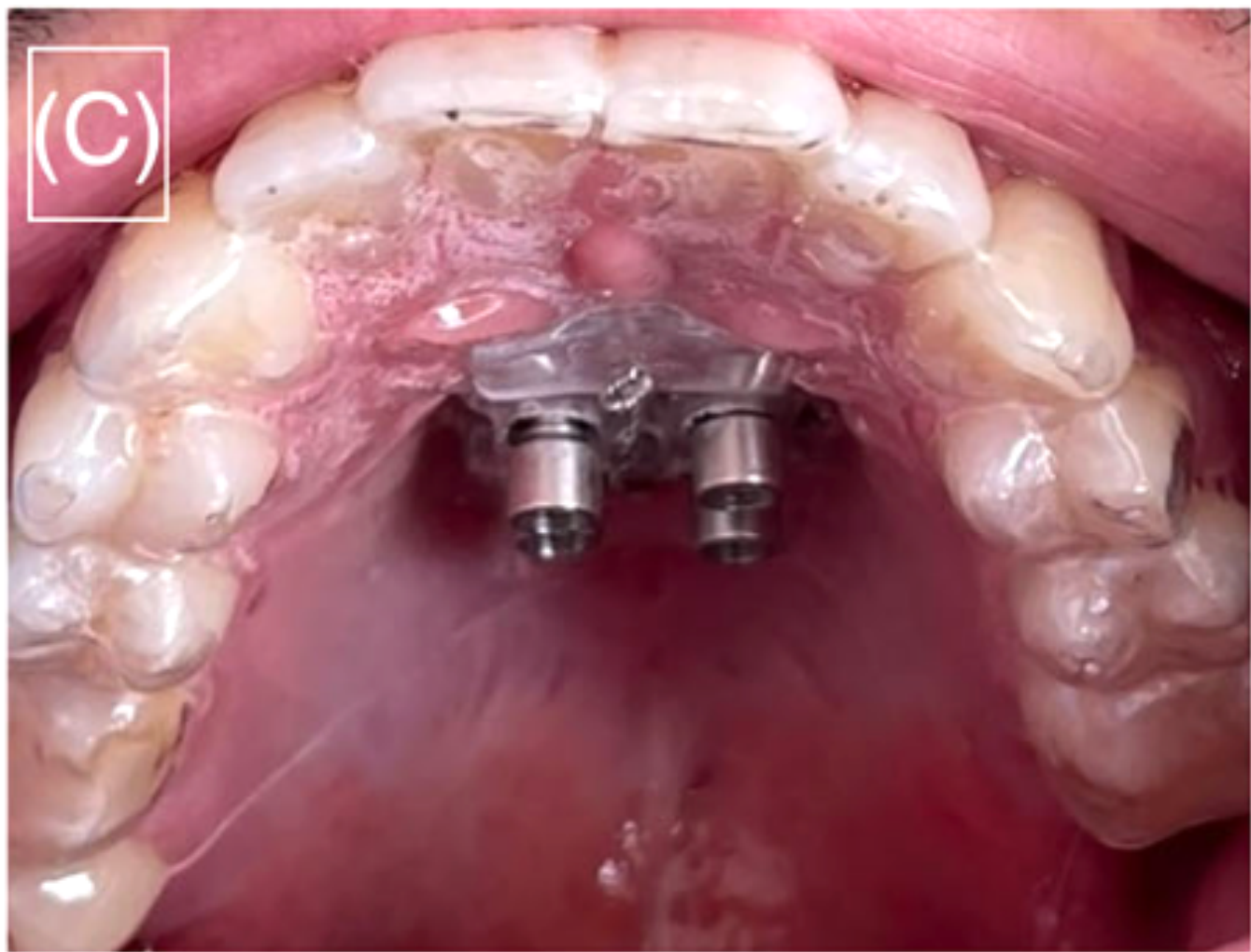


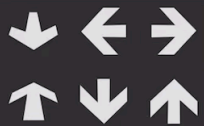
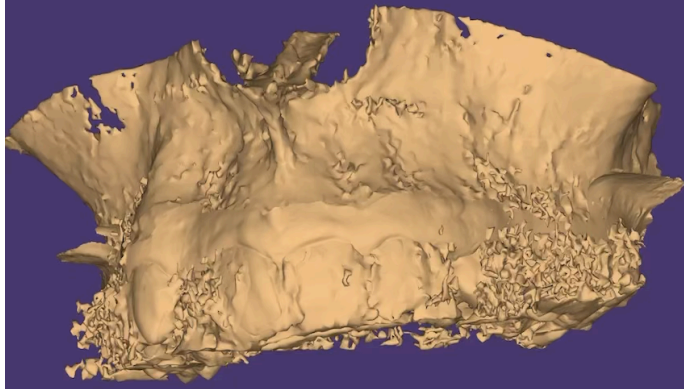


(B)



(C)

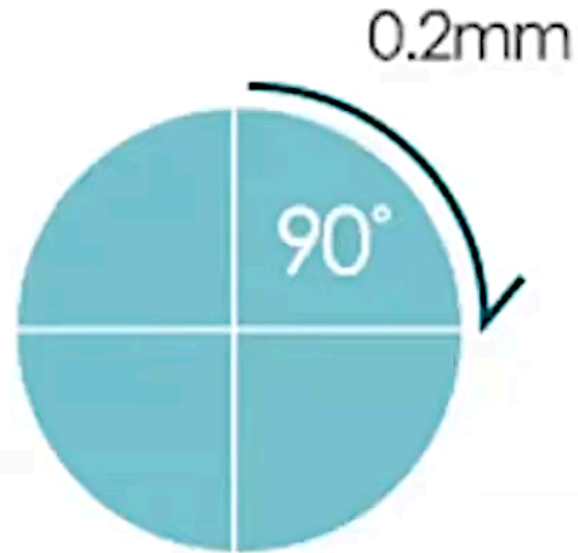




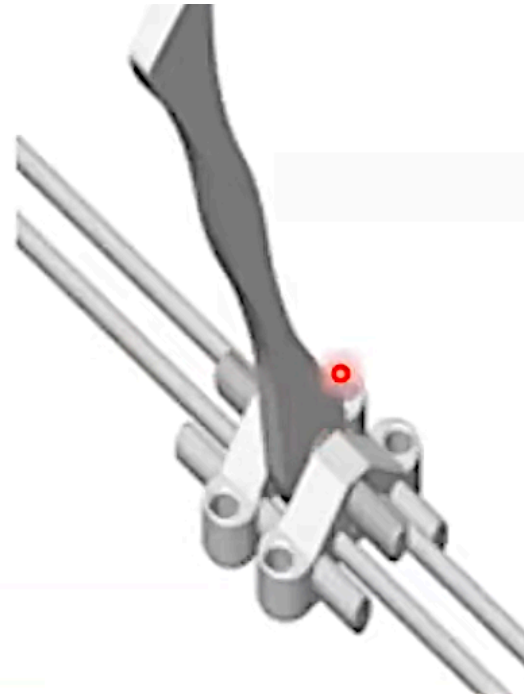
exocad



## MSE I



## MSE II



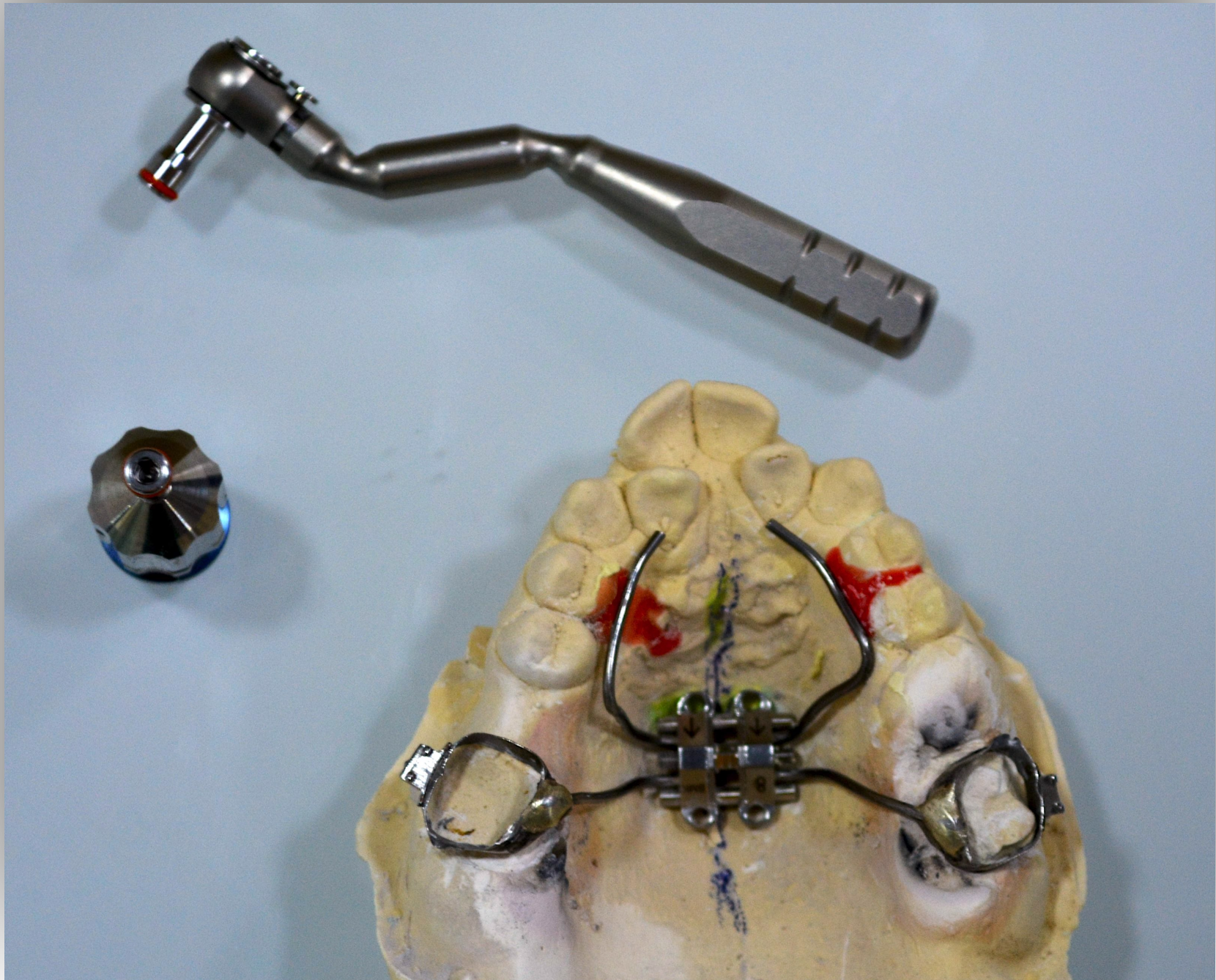
**Pin**  
**Quarter turn**  
**1.5mm TADs**

**Ratchet Wrench**  
**One sixth turn**  
**1.8mm TADs**

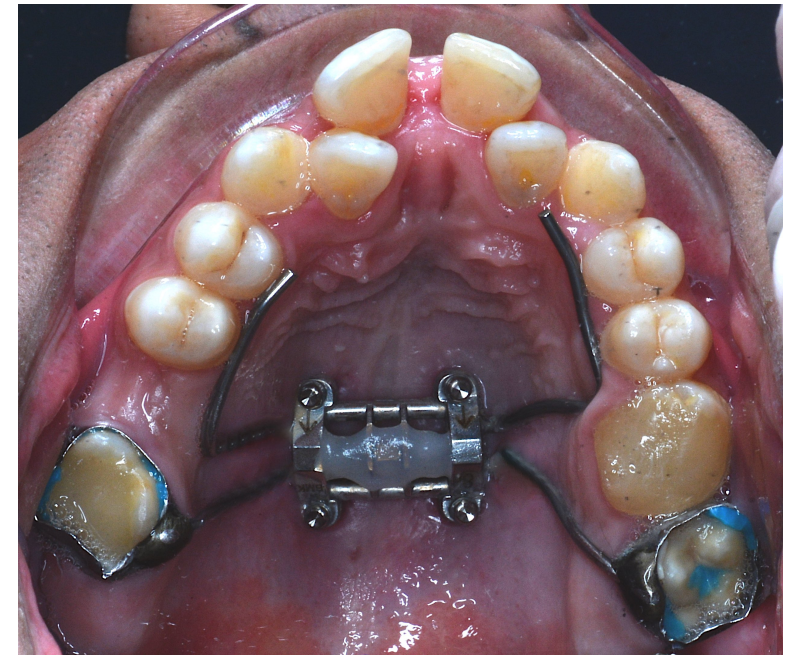
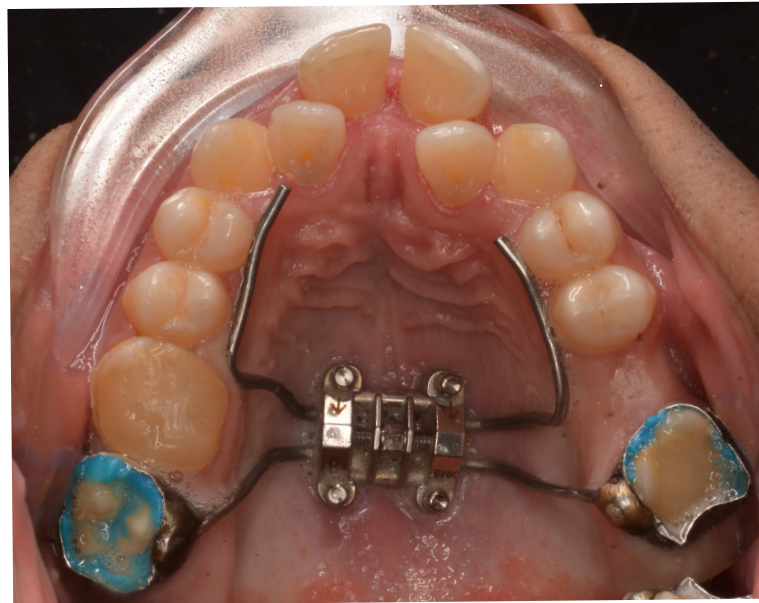
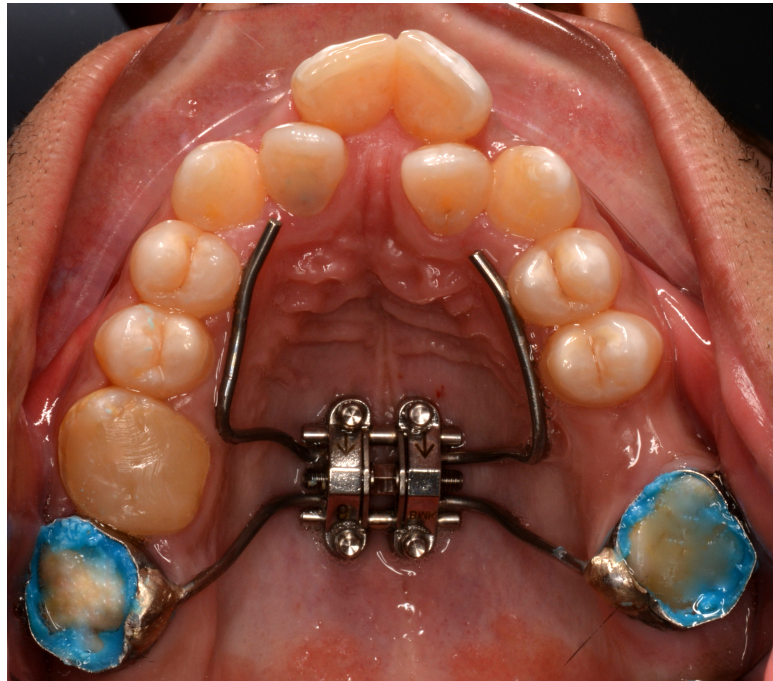
# Guideline for activation

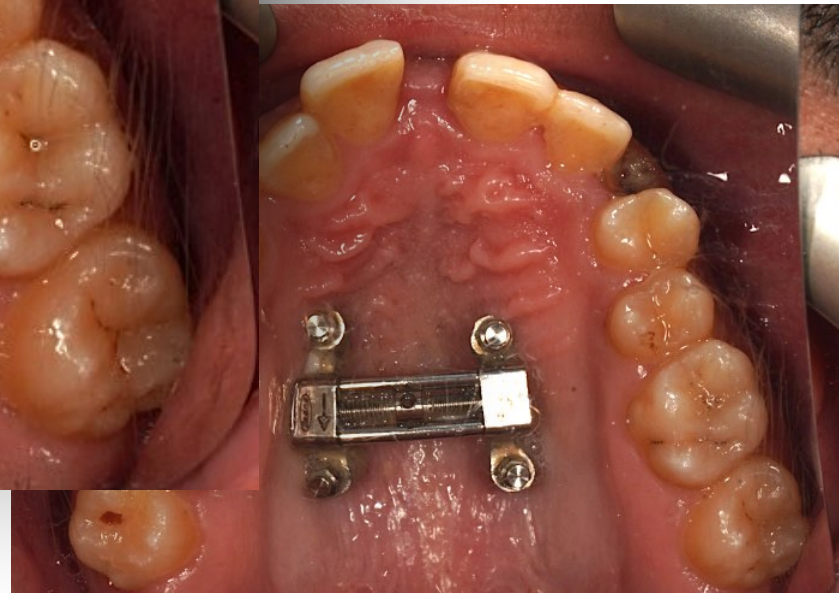
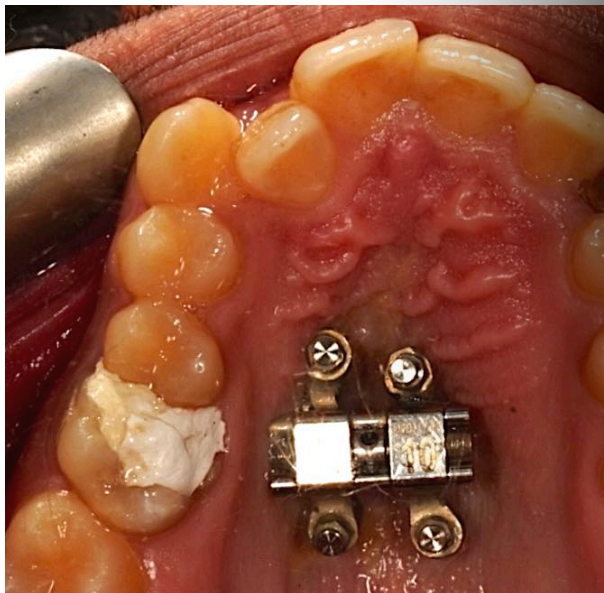
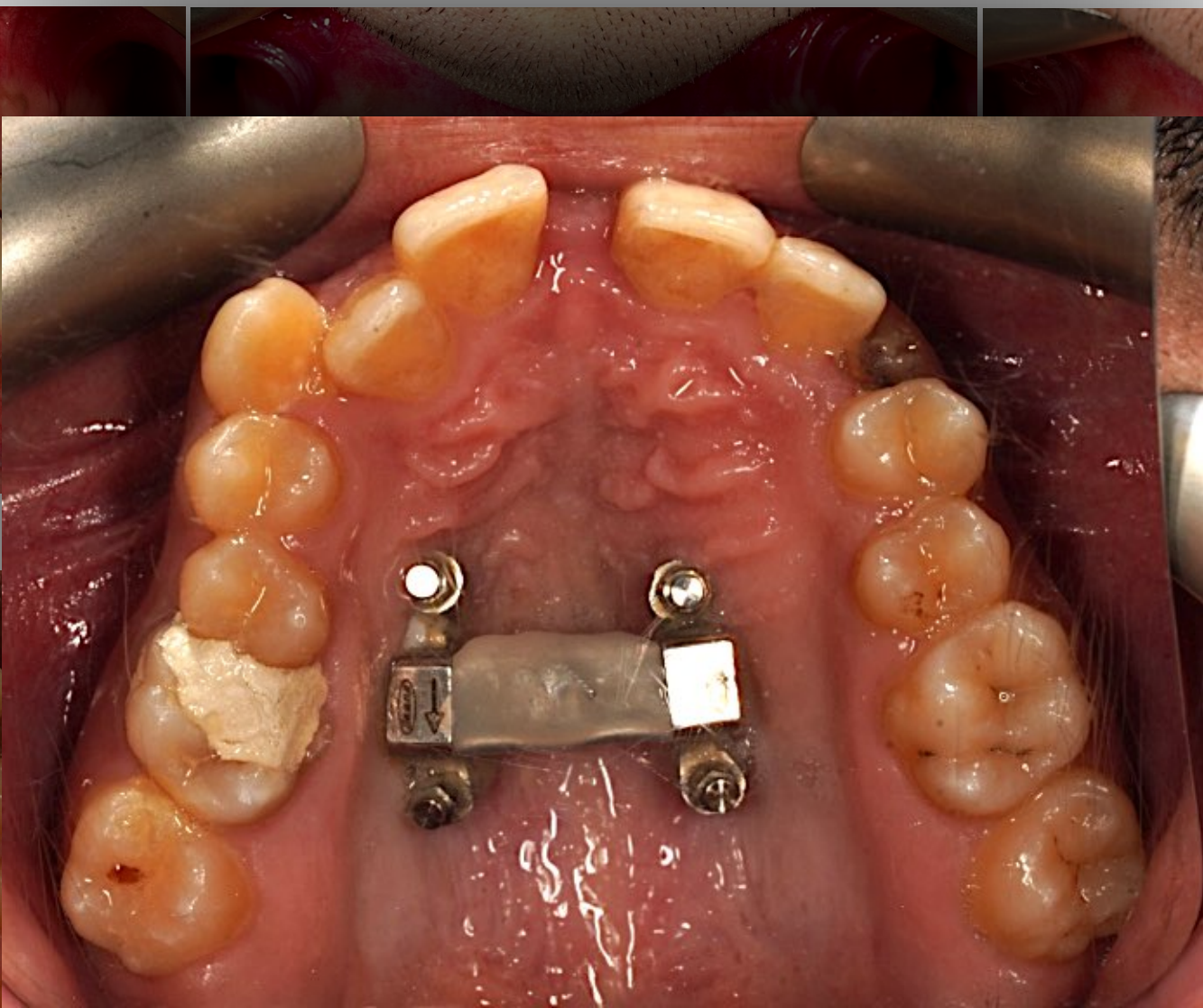
	MSE I	MSE II
Early teens	<b>1 turn</b> (0.1mm) / 2 days	<b>1 turn</b> (0.13mm) / day
Late teens	<b>1 turn</b> (0.2mm)/ day	<b>2 turns</b> (0.27mm)/ day
Early to Mid-20's	<b>2-3 turns</b> (0.4-0.6mm)/ day	<b>4-6 turns</b> (0.5-0.8mm)/ day
Older	<b>≥2-3 turns</b> (≥0.4-0.6mm)/day	<b>≥4-6 turns</b> (≥0.5-0.8mm)/day
After Diastema	<b>1 turn</b> (0.2mm) / day	<b>2 turns</b> (0.27mm)/ day





**Cases**

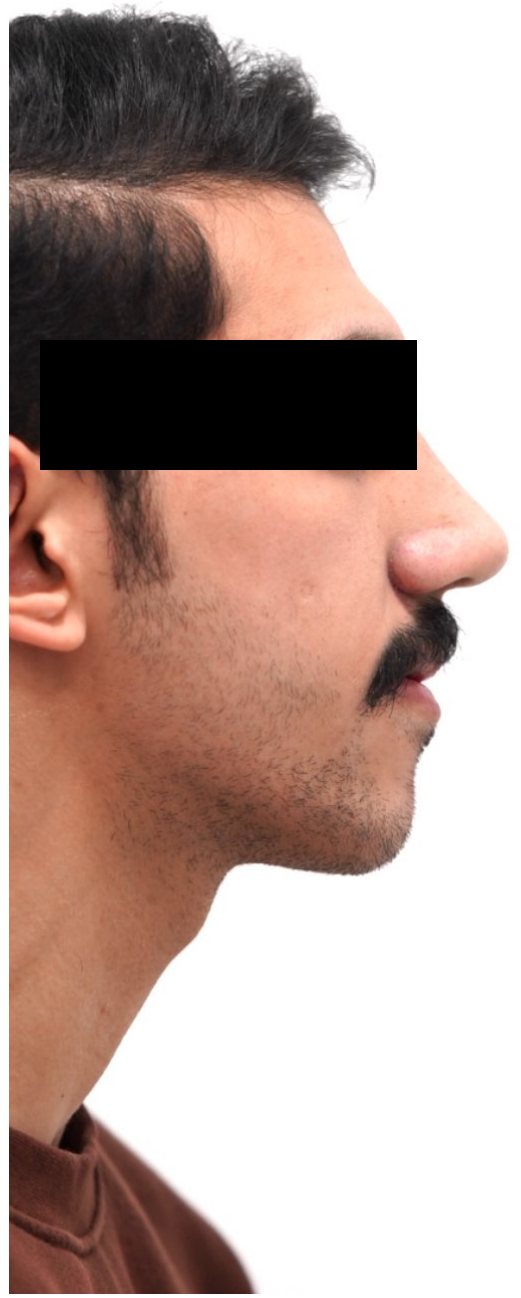




















# Conclusion

MARPE considered an efficient expander for the adult patients, as it avoids the unwanted dental effects that occur by using the conventional RPE and the invasiveness of the surgical expansion.

It produce a good skeletal results.

**Thank you**