

AAO 116th Annual Session
Orlando, FL
May 01 (Sunday), 12:30 - 1:15 pm, Room 311



**Title: Clinical and Biomechanical Considerations of Using TADs
and Novel Appliances to Correct Challenging Cases**

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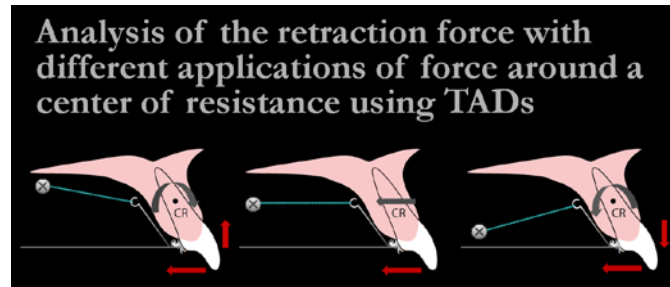
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Three learning objectives:

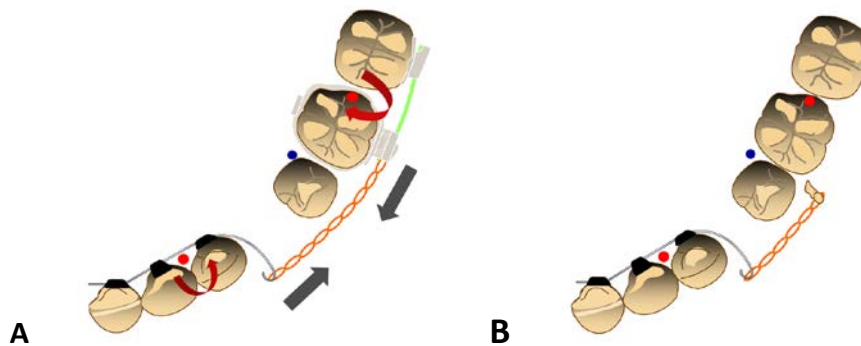
- Discuss clinical applications and biomechanical considerations of temporary anchorage devices (TADs) and novel appliances;
- Describe indications for extraction versus distalization;
- Evaluate pre-treatment and post-treatment superimposed cone-beam computed tomography images after TADs have been applied

The use of temporary anchorage devices (TADs) for reinforcement of orthodontic anchorage has become increasingly popular, especially in adult patients who do not want to wear extraoral anchorage appliances. TADs are convenient and provide good treatment results without the need for patient cooperation. However, if biomechanical factors are not considered during treatment with TADs, there may be undesirable side effects. In this lecture, Dr. Park will present various cases where TADs and novel appliances were used to achieve sagittal correction and treatment outcomes will be discussed using before and after treatment superimposed three-dimensional cone-beam computed tomography scans.

Bimaxillary Dentoalveolar Protrusion Correction with TADs



According to the position of the TADs and length of the lever-arms, during retraction, it can cause clockwise rotation and intrusion of the incisors, bodily retraction, or counterclockwise rotation and extrusion of the incisors.

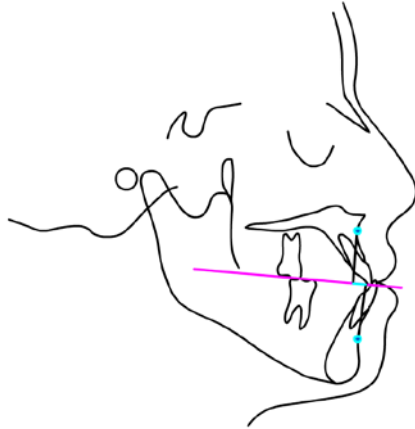


A. During retraction of the anterior teeth using a modified lingual retractor, mesiolingual rotation and mesial tipping occurred around the center of rotation of the mandibular posterior teeth. **B.** By using a miniscrew, posterior side effects can be prevented.

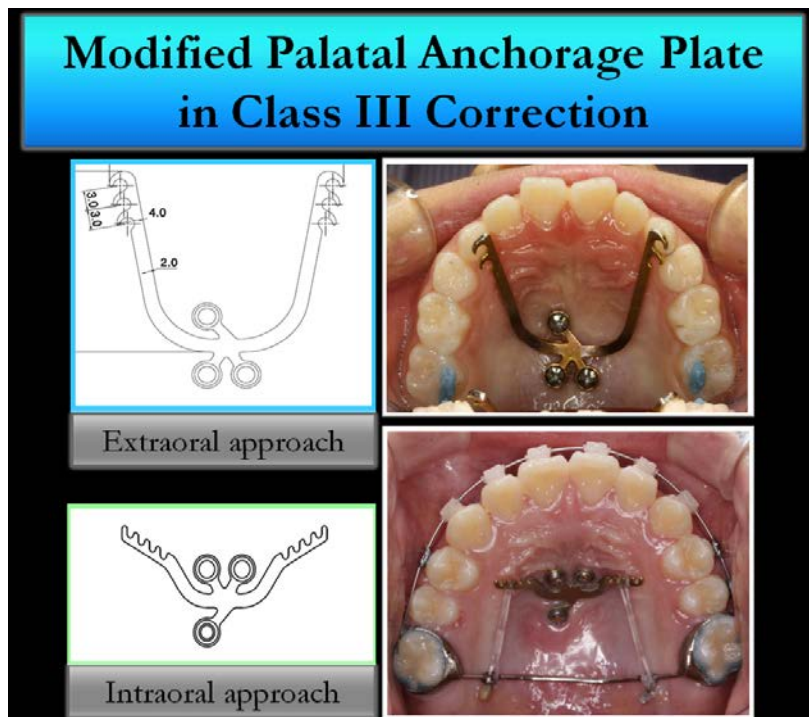


The best place to insert palatal plates for molar distalization is between the second premolar (or primary second molar) and the first molar. Approximately 2 mm of clearance is needed between the palatal plate and palatal tissue.

Class III Correction with TADs



If Class III elastics are applied in Class III cases, the occlusal plane angle will decrease and Wits number will increase with correction of the dental relationship. Facial profile will be improved with downward and backward movement of mandible, but anterior facial height will increase.



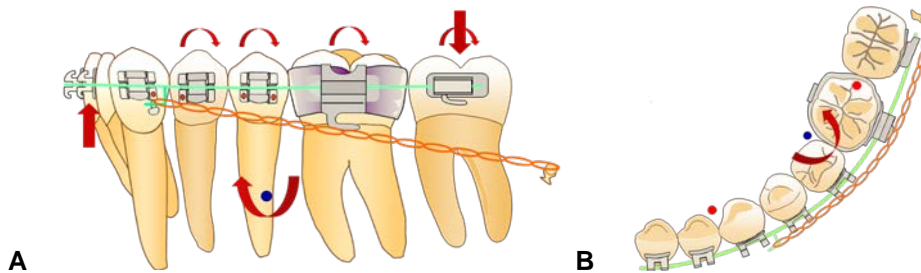
Modified palatal anchorage plate for maxillary protraction with facemask and protraction of maxillary dentition.

Placement Site of Ramal Plate



Distalization of the mandibular dentition using a ramal plate for skeletal Class III malocclusion correction

Total Arch Distalization with TADs



A. During total arch distalization around the center of resistance, there is a moment that produces extrusion of the anterior teeth, intrusion of the posterior teeth, and tip-back of posterior teeth. **B.** From the occlusal view during distalization with TADs, there is distolingual rotation of the posterior teeth around the center of resistance.

Summary

- The center of resistance of anterior teeth moves apically as the number of consolidated units increase. At the 8 mm level of miniscrews from the cervical line of the first molar, a bodily retraction may be achieved with a lingual retractor.
- Approximately 4 mm of retraction of the upper incisal edges results in 1 mm of anchorage loss of the upper molars.

- Palatal plates are effective in molar and total arch distalization or protraction in adults and adolescents.
- A ramal plate can be used for skeletal Class III malocclusion correction by distalizing the mandibular dentition.
- Considering that the conventional amount of maxillary molar distalization is approximately 3 mm, distalization may be the treatment of choice when less than 3 mm of molar distalization is necessary.

References

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Dr. Jae Hyun Park is a Professor and Chair of the Postgraduate Orthodontic Program at the Arizona School of Dentistry & Oral Health. He is a Diplomate of the American Board of Orthodontics. Dr. Park has received several awards for scientific and clinical excellence including the Charley Schultz Award (1st Place Winner in the Scientific Category at the Orthodontic Resident Scholars Program) and the Joseph E. Johnson Award from the AAO. He also serves as an editorial board member of several peer-reviewed orthodontic and dental journals. He was recently invited to be a guest editor of "Seminars in Orthodontics." He was the chief editor of a recently published book entitled, "Computed Tomography: New Research," and recently co-authored a book, "Molar Protraction: Orthodontic Substitution of Missing Posterior Teeth." While working as a full-time faculty member since 2008, he has published more than 130 scientific and clinical articles in peer-reviewed orthodontic and dental journals including two cover pages in the AJO-DO. He also lectures nationally and internationally. Dr. Park is currently Editor-in-Chief of the PCSO Bulletin.