

Australian Society
of Orthodontists



THE UNIVERSITY OF
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Removable Orthodontic Appliances

PART 2

*Creating **B**righter Futures*

Removable Orthodontic Appliances PART 2

Removable appliances are designed to be easily removed from the mouth by the patient for cleaning, activation and when required.¹

Commonly used removable appliances

Active removable appliances

Upper Removable Appliance (URA) with an expansion screw

Used primarily in the mixed dentition, correction of a posterior crossbite may be achieved with a removable expansion appliance incorporating a midline screw (Figure 10). Overcorrection of the crossbite is desirable and provides a more stable correction. The appliance is often worn as a retainer for a number of months to further enhance long term stability.

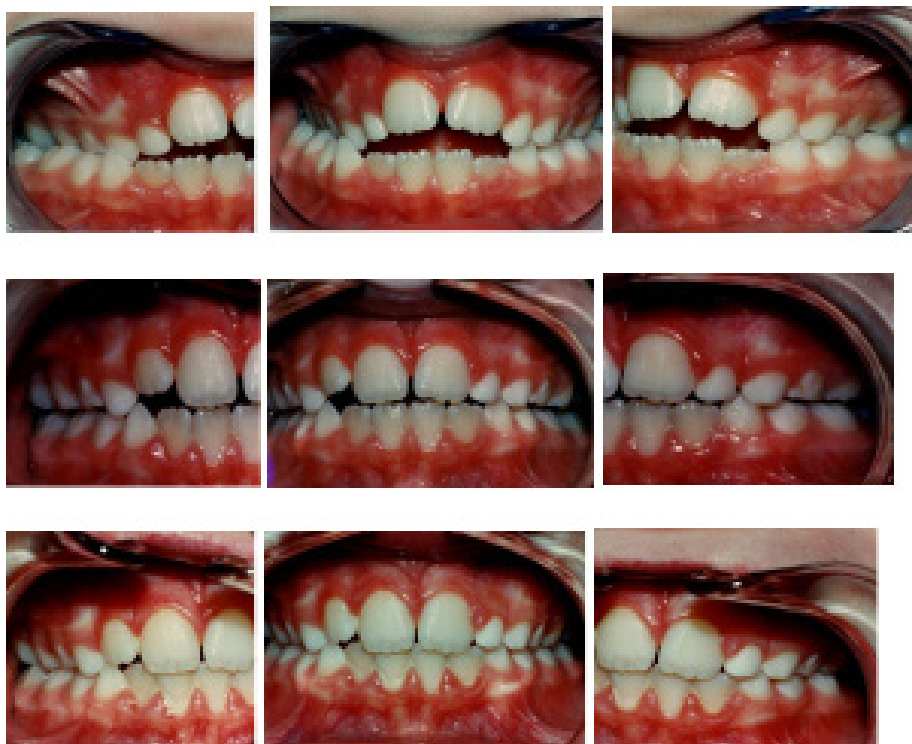


Figure 10. Pre-treatment posterior crossbite and slight anterior overjet and open bite (top). Immediately following correction with a removable screw expansion appliance (centre). Note similarity with appliance shown in Figure 5, but with a labial bow added. The labial bow was used to improve the anterior relationship. After gradual cessation of wearing the appliance the teeth settle into occlusion (bottom).

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Upper Removable Appliance (URA) with a spring

URA with a palatal Z spring or T spring may be used to tip anterior teeth out of crossbite (Figure 11). These appliances often incorporate posterior capping over the occlusal surfaces of buccal teeth to open the bite and allow unimpeded correction of the crossbite (Figure 12, Figure 13).



Figure 11. An anterior crossbite corrected with a removable appliance
(Taken from Handbook of Orthodontics, Cobourne M, DiBiase A 2010)



Figure 12. A removable appliance with a spring to correct the cross bite of the upper right lateral incisor, at pre-treatment (top), after 4 months with correction achieved (middle) and after 9 months with settling of the corrected lateral incisor (bottom).



Figure 13. A removable plate with both a screw expansion and spring as active components to correct posterior and anterior crossbites

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Passive removable appliances

Hawley and Begg retainers

The Hawley appliance functions to maintain post treatment tooth positions and alignment. It consists of an acrylic baseplate and labial bow.⁶ The Begg appliance resembles the Hawley but rather than using Adams clasps which pass over the occlusal surfaces of posterior teeth, an extension of the labial bow passes along the buccal of the posterior teeth and around the distal of the terminal molar to connect to the base plate (Figure 14). This modification enhances posterior occlusal settling after orthodontic treatment but may not be as retentive.

Vacuum formed clear retainers or Essix/Truain retainers

Thermoplastic clear retainers have become the most popular retainer in use today.⁷ They offer significant cosmetic advantages but usually have a shorter lifespan (Figure 15).



Figure 14. A modified Hawley retainer with arrow clasps rather than Adams clasps

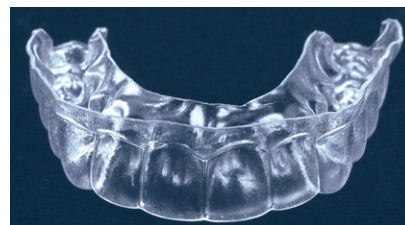


Figure 15. A Vacuum Formed Retainer

Functional appliances

Functional appliances are used to produce orthopaedic changes by altering the influence of the muscle groups that affect the function and sagittal &/or vertical position of the mandible.⁸ They can either be removable or fixed. Functional appliances were discussed in detail in a previous issue of Brighter Futures.⁹

Examples of removable functional appliances include:

- Clark Twin Block (Figure 16)
- Frankel functional regulator
- Bionator
- Activators



Figure 16. Twin Block Functional Appliance

Sequential Thermoplastic Aligners

The concept of sequential aligner therapy was introduced as early as 1946 when Kesling¹⁰ devised a method to use a set of sequential tooth positioners to gradually move teeth into the desired position. Following the development of more advanced vacuum-formed materials in the 1980's it became possible for such appliances, made on dental casts with teeth slightly reset, to produce more efficient tooth alignment. This procedure presented a novel and more aesthetic approach to achieving simple tooth alignment which would appeal to many people seeking orthodontic treatment, especially adults.

In the late 1990's significant advances in this technique of orthodontic tooth movement were made with the advancement of various clear aligner systems, the best known being Invisalign by Align Technology and Clear Smile, an Australian company. Advancements in intraoral scanning and three-dimensional CAD/CAM modelling technologies, including the use of bonded tooth attachments, have improved the ability to perform more difficult types of tooth movements such as extrusion and rotation using aligners. Despite these improvements, clear aligner therapy continues to have limitations to achieve predictable complex tooth movements therefore it is not suitable to treat all malocclusions. An overview of clear aligner therapy is covered in previous issues of the Brighter Futures Newsletter.¹¹

Conclusion

Removable appliances can offer a simple and cost effective method of dealing with more straightforward orthodontic problems. They can have orthopaedic as well as dental effects but do not offer the degree of control inherent in fixed appliances. However, even though the use of traditional acrylic and wire appliances reduces, as appliances such as Invisalign continue to be enhanced, the range of cases that can be satisfactorily treated with these removable appliances will increase.

References upon request



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