



TECHNICAL GUIDE

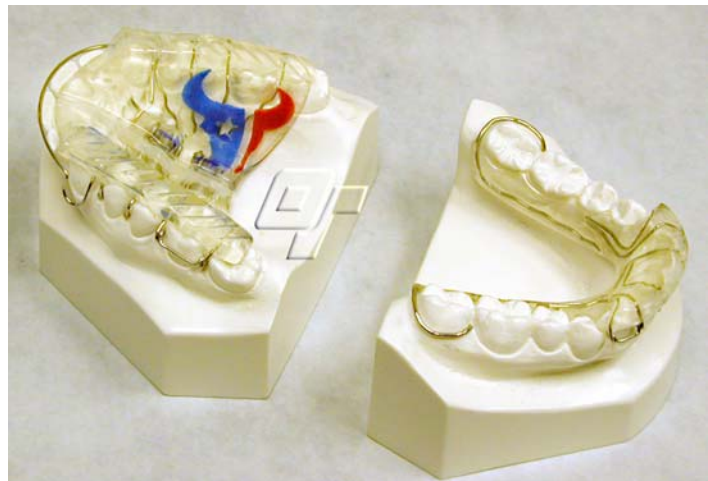
The Mahony Twin Block Appliance



History:

The Twin Blocks were developed in the early 1980's by Dr. William Clark, an orthodontist from Scotland. The basic Clark Twin Block appliance achieves Class II correction because of the way the upper and lower inclined occlusal planes ('wedges') interlock together to hold the mandible in a forward position. With the mandible held forward, bone remodeling occurs as a result of the combination of stretch on the musculature and repositioning of the condyles. The upper appliance generally includes an expansion screw for lateral development so that as the mandible is advanced the upper arch can be widened to accept the new position of the lower arch. The upper appliance also has occlusal pads which cover the molars. Traditionally, the lower appliance is similar to a Hawley type appliance with occlusal pads which cover the bicuspid. The occlusal pads interface at angles that reposition the mandible to the desired bite.

In the early 1990's, Dr. Derek Mahony, an orthodontic specialist from Sydney, Australia, modified the original Twin Block design. His design was based on the original Clark Twin Block but was designed to be more suited for



all permanent dentition cases. In fact, the modifications (see **Description** that follows) that he incorporated into the design resulted in an appliance that is superior at opening deep bites and leveling the curve of spee.

There are many advantages to and great flexibility with the Twin Block technique. Since the appliances are designed to be worn full time, the continuous application of force stimulates maximum growth response to correct the jaw-to-jaw relationship. Likewise, full time wear results in the best response to expansion capabilities that are incorporated into the appliances.

Other than the standard appliances described here, there are several variations of the Twin Block appliance. For example, Twin Blocks for Open Bite (or high angle) cases and Class III Twin Blocks. Ask your *Orthodontic Technologies* representative for more information.

Description (Mahony Modifications):

Dr. Mahony's modifications were intended to enhance both function and form. The first modification was to place **the occluding blocks of acrylic in a more anterior position**. The **interlocking contact points of the blocks ('wedges')** were moved from the **bicuspid region to the cuspid region** (specifically the distal third of the cuspids). By placing the wedges over the cuspids it allowed all of the posterior teeth, not just the molars, to erupt during treatment. Also, **the contact surfaces of the blocks were steepened to an angle of 70 degrees instead of the original 45 degrees**. The steeper angle made inadvertent mandibular retrusion less likely to occur.

A second major modification was the addition of an **anterior occlusal cap of acrylic on the lower incisors**. The main function of this cap is to intrude the upper and lower incisors (thus aiding in the opening of the bite) and to prohibit proclining ('dumping') of the lower incisors. The anterior cap also aids in comfort and ease when the patient is eating, speaking, and swallowing by giving the tongue a stopping point (as opposed to the open airway space usually created by appliances with posterior bite planes).

Another major modification was the change of clasping used for retention. The lower appliance incorporates a pair of **C-clasps around the terminal molars, Delta clasps on the lower cuspids, and a pair of anterior ball clasps**. In addition to the clasping, the strength and retention of the lower appliance is enhanced by the lingual flanges of acrylic that extend all the way to the distal of the terminal molars. The upper appliance incorporates **a pair of Delta clasps on the first permanent molars, a pair of ball or arrowhead clasps between the bicuspids, and a cuspid to cuspid labial bow**. Dr. Clark did not use the labial bow for esthetic reasons but Dr. Mahony incorporated the **labial bow to aid in anchorage and to prohibit the distal driving of the upper posterior segments**.

Other modifications include the addition of **deep groves or slices cut into the occlusal surface of the acrylic bite planes for ease of mastication while wearing the appliance**. As well, **finger nail grooves** are cut into the buccal planes of the occlusal blocks to aid in patient removal of the appliance. This puts less stress on the clasping and results in decreased distortion of the appliance shape.



As with the Clark Twin Block, there is an expansion component incorporated into the upper appliance. The Mahony modification of this component is that **two expansion screws** are used instead of just one.

Indications:

Class II case, deep bite, all permanent dentition.

Contraindications:

Division 2 incisor inclination.

Narrow upper arch (upper arch width discrepancy of not more than 2 or 3 mm).

Narrow lower arch (lower arch should be fully expanded prior to TB treatment).

Class III.

Alternate Appliances:

MARA (will not correct a deep bite as well).

Clark Twin Block (better suited for mixed/transition dentition cases).

CBJ Herbst (will not correct a deep bite as well, better suited for mixed/transition dentition cases).

Advantages of this Appliance are:

Superior at opening a deep bite.

Especially suited for all permanent dentition cases.

Clinical Procedures:

1. Complete maxillary and mandibular impressions. Make sure that the distal of the lower terminal molars are fully captured and that the upper palate is clear and accurate.
2. Obtain a pull forward Twin Block bite. Usually, advance the mandible to an end on relationship, or, 5 to 8 mm advanced from centric occlusion (whichever comes first). Establish a vertical dimension of 4 to 5 mm in the bicuspid region. Leave a small opening of 1 to 2 mm between the anterior incisors.
3. Pour impressions with lab stone.
4. Send the case to the lab with a completed *Orthodontic Technologies* Rx form. Remember to offer your patient Wild Things®. They are beautiful and they encourage compliance!

Delivery Suggestions:

1. Trial fit the appliance. Make adjustments to the acrylic or wires if needed.
2. Give instructions to the patient on wearing and caring for their appliance. Also give instructions on the frequency and rate at which to turn the upper expansion screws.
3. Reschedule patient for 1 week to check the appliance and for compliance.
4. Reschedule thereafter for every 3 to 4 weeks.

Adjustment suggestions for Vertical Development:

The Twin Block appliance is generally used to open a patient's bite, both skeletal and dental, by progressively trimming away the upper posterior bite plane. The mandibular posterior teeth will migrate occlusally (supra-eruption) as the acrylic resin of the upper posterior bite plane is trimmed away in the areas of occlusion. Adjustment of the upper bite plane usually does not begin until the patient has worn the appliance for approximately 3 months, then is reduced in ½ to 1 mm increments at each patient visit. Eventually the entire upper bite plane will be removed. See diagrams.

IMPORTANT: Do not trim or alter the acrylic where the inclined planes meet. The inclined planes are what hold the mandible in its advanced position and altering them will affect that relationship.

Length of Treatment Time and Results Expected:

The active appliances should continue to be worn until the desired expansion, mandibular repositioning, and vertical dimension is achieved. A treatment time period of 6 to 9 months would be considered normal. Severe Class II cases and/or cases where compliancy took some time to establish may take up to 12 months or more to finish. The Mahony Twin Block design eliminates the need for a second, support phase appliance.

Please note, Dr. Mahony strongly recommends removing the factors causing the Class II relationship by achieving proper arch width and correction of Division 2 incisor inclination *before* Twin Block Therapy begins.

Holding Phase:

As with any orthopedic appliance, a holding phase of 2 to 3 months is recommended before the next phase of orthodontic treatment begins.

Removal Suggestions:

After Twin Block therapy is completed, the case can be finished with straightwire and brackets. It is recommended that the molar relationship be stabilized by using a FRLA (fixed-removable lingual arch) in conjunction with closed-arch straightwire mechanics.

Stabilization of the Teeth and Bone Following Treatment:

Long term retention is recommended.