Carriere Class II Motion Appliance

Brock Rondeau
D.D.S. I.B.O., D.A.B.C.P., D-A.C.S.D.D.,
D.A.B.D.S.M., D.A.B.C.D.S.M.

This Class II Motion Appliance was developed by the world renowned orthodontist, Dr. Luis Carrière from Barcelona Spain. Dr. Carrière's philosophy is to fix the sagittal problems first. Correct the Class II molar relationship in Phase I in either the mixed or permanent dentition. Then place the straightwire appliance when you have a Class I molar relationship. This appliance is very popular with the patients and corrects the Class II molar relationship in 4 months or less.

Place Carriere Bar from mesial 1/3 upper cuspid to middle upper first molar. Direct bond buccal tubes on lower first molars (younger patients) or lower second molars.

Essix Retainer lower arch.
Class II Force 1 elastic ¼", 6 ½ oz from upper cuspid to lower first molars: one month

Force 2 elastic 3/16", 8 oz worn second, third, and fourth month.

Carriere Class II Motion Appliance

Patient comfort	Allow full lateral, mandibular movements. Remove elastics to eat.
Elastics	Change elastics 3 times daily after each meal.
Esthetics	Motion Appliance is barely noticeable when in place.
Hygiene	Not a problem Patient can brush easily around the appliance.
Patient compliance	Extremely high. Patients are very enthusiastic prior to treatment. This will reduce time in fixed braces. Reduces overall treatment time by 3-6 months.

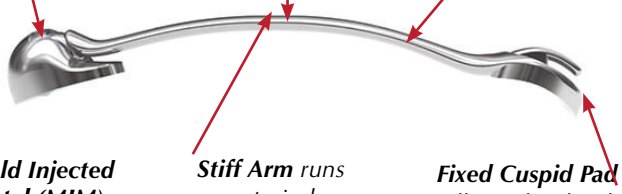
One extremely important factor in correcting Class II malocclusions is to first derotate the common problem of mesially rotated first molars. Very difficult to obtain a Class I molar relationship with mesially rotated first molars. Research indicates that 83% of malocclusions present with a mesial rotation of the maxillary first molar.[1] The ball and socket apparatus attached to the molar is specifically designed to correct this problem.

The Characteristics

Molar Pad Ball *articulates in the socket.*

Sleek and Non-Invasive *design delivers greater comfort.*

Hooks on Pad *for attachment of the Class II elastics.*



Mold Injected Metal (MIM), *made Stainless Steel for perfect definition of the design.*

Stiff Arm *runs posteriorly over two upper premolars in a slight curve. Maintains exact space between pre-molars during distalization.*

Fixed Cuspid Pad *allows the distal movement of the cuspid along the alveolar without tipping.*

Articulated Socket - Loose but Controlled

Loose but Controlled Forces:
The ball and socket joint provides maximum freedom of movement, but also has built-in stops that allow the molars to move directly to their desired position while preventing any unwanted over rotation and tipping

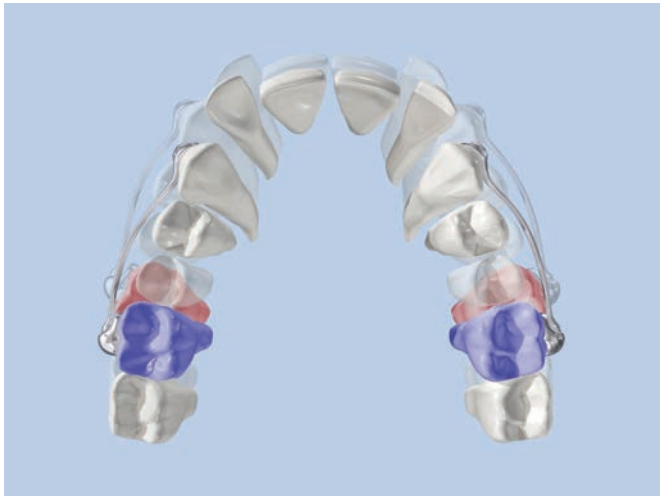
Right Side Rigid Arm 2 dots
Left Side Rigid Arm 1 dot

Molar ball and socket corrects rotations and uprighting of the maxillary first molars. Built-in stops prevent over rotation and over uprighting.

Placement: 7 minutes
Removal: 3 minutes

1. Provide controlled rotational movement of the maxillary first molar and the palatal root.
2. Upright the maxillary first molars
3. Distalize the maxillary posterior segment cuspid to molar as a unit while controlling unwanted torquing or tipping.
4. Distal rotates mesially rotated first molars.

Mesially Rotated First Molar



Distal Rotation First Molar Using Motion Appliance

Anterior Pad Carriere Appliance

Attached to the mesial 1/3 of the cuspid or to the first bicuspid is a rigid half-round arm. The arm then curves posteriorly over the bicuspids, ending as an articulation ball utilizing a socket on the posterior pad, which direct bonds to the maxillary first molar.

Moveable Posterior Pad

Direct bonds to the maxillary first molars and houses an articulating ball in a socket to create free yet controlled movement that allows the molars to travel directly to the desired position after derotating and uprighting it.

Rigid Half-round Arm

Curves over the two bicuspids and connects the anterior and posterior pads providing stability to the cuspids. If cuspids are not erupted arm could go from first bicuspid to first or second upper molar.

Fixed Anterior Pad

Fixed anterior pad bonds directly to the maxillary cuspid or first bicuspids. This promotes bodily distal movement of the cuspid along the alveolar ridge. Class II elastics are attached to the hook on the cuspids.

Posterior Pad

Ball and socket joint offers maximum freedom of movement that allows molars to travel directly to the desired position. It has built-in stops that prevent unwanted over rotations, tipping and torquing.

To prevent a relapse, the clinician must continue distalization of the cuspid until the distal inclined plane of the upper cuspid touches the mesial inclined plane of the lower first bicuspid. (Super Class I Cuspid). Once the Carriere Motion Appliance has been removed we must ligate the posterior teeth together with .012 stainless steel ties in a figure 8 from the maxillary cuspids to the maxillary molars.

First Molar Movement 3 Movements

1. Derotate the mesially rotated molar
2. Upright the molar
3. Distalize the molar

Once the molar uprights the articulator of the ball within the socket prevents unwanted distal tipping.

Indications Carriere Class II Motion Appliance

1. Class II, Div 1. Overjet 6 mm or less.
2. Unilateral Class II molar.

Class I molar one side
Class II molar one side

Facial Types
Best Case Brachycephalic
Poor Case Dolichocephalic

Anchorage

Must have excellent anchorage on the lower arch to prevent protrusion of the mandibular incisors when the patient is wearing the Class II elastics.

Three types of mandibular anchorage:

1. A mandibular Essix appliance with direct bond buccal tube or preferably, side kick, on the mandibular second molars (preferred method). Younger patients, buccal tube mandibular first molars.
2. Mandibular lingual arch with molar tubes on the buccal lower molar bands. Mesial rests lower first bicuspids (flowable composite). Mixed/Permanent dentition. Preferred method if lower incisors are lingually inclined or patient is a poor cooperator.
3. TADS, Temporary Anchorage Devices placed in the area of the mandibular molars. Attach TADS to mandibular molars with S.S. ligature ties to increase posterior anchorage.

1. Mandibular Essix Appliance

The mandibular Essix appliance is an excellent source of anchorage for Class II elastics. It unlocks the occlusion and allows the mandible to come forward in certain cases. It must be worn full time when the patient is wearing the Class II elastics. Should be removed for meals. Recommended material is A+ with .040" (1 mm thickness) (Dentsply Raintree Essix). This helps control flaring of the lower incisors.

A window is cut around the brackets or Side Kicks bonded to the buccal of the lower second molars. Impressions for Essix appliance use PVS material (Polyvinylsiloxane) or alginate. You may also scan lower arch and send scan to orthodontic lab. Side Kicks are preferable to buccal molar tubes. Better retention for Class II Force one and Force 2 elastics.

Sidekicks

- Mesh pad with angled hook for elastic
- May be placed more gingivally
  Allows more vertical pull
- Less chance of patient biting them off
- Less area of essix needs to be cut out
- More economical than buccal tubes (about 25% the cost)

2. Mandibular Lingual Arch

A mandibular lingual arch is particularly suited for patients with strong musculature for providing anchorage to prevent protrusion of the lower incisors with Class II elastics. The ideal wire is .036″ and goes from second molars if erupted, otherwise from the lower first molars. The lingual arch is passive and patient acceptance is high. The lingual arch is preferable for younger patients or in cases where you might be concerned that the patient may not cooperate wearing the lower Essix retainer as prescribed.

Mesial rests lower first bicuspids (bonded with flowable composite).

Extrusion of mandibular molars.

This is minimal (less than 1 mm.) with Class II elastics due to the anchorage control of the lower lingual arch.

3. TADS (Temporary Anchorage Devices)

Ideally placed between the lower first and second molars.

Sizing the Appliance

1. Use the disposable Carriere Motion Appliance ruler provided with the appliance. Measure from the mesial 1/3 of the maxillary cuspid to the middle of the maxillary first molar. Most popular sizes are 23 mm, 25 mm or 27 mm.
2. If the cuspid is unerupted or severly rotated measure from the middle of the maxillary fist bicuspid to the middle of the maxillary second molar (Shorty).

Instructions on Elastics

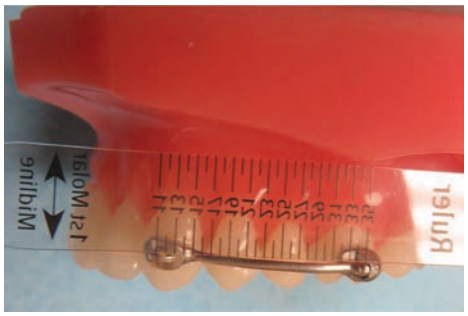
Due to the vertical force vector as a result of opening the mouth while talking this may result in mild extrusion of the maxillary cuspids. This can be an advantage if the patient presents with a deep overbite. Elastics are to be removed for eating. Patients should change the elastics after every meal. If the patient wears elastics when eating this can cause excessive extrusion of the upper cuspids.

Motion Appliance Invisalign®

Many Invisalign® or Clear Aligner clinicians are very excited about the use of the Motion Appliance to correct the Class II molar relationship either laterally or unilaterally prior to the use of the clear aligners to straighten the teeth.

Jacob Male Age 16

Class II Cuspid
Class II Molar



Mesial 1/3 Cuspid Middle Molar

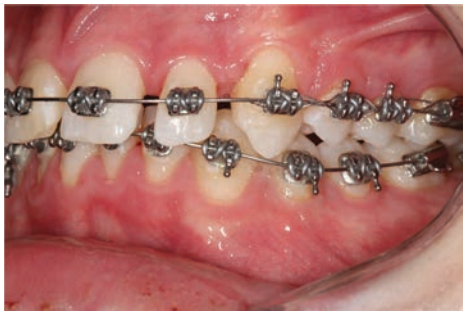
Force 1 6oz Elastic 1 Month

Carriere Motion Appliance

Essix Retainer
Bracket Second Molar

Class II Cuspid
Class II Molar

Class I Cuspid Molars
3 Months



S.S. Tie Cuspid to Molar

S.S. Tie Cuspid to Molar
Anterior Chain Cuspid to Cuspid

Class II Cuspid
Class II Molar

Class I Cuspid
Class I Molar

Treatment Time	
Phase I Correct Sagittal First Carriere Class II Motion Appliance 4 Months	Phase II Straightwire 8 Months
Total Time	**12 Months**

Julia Female Age 12 Weak Smile

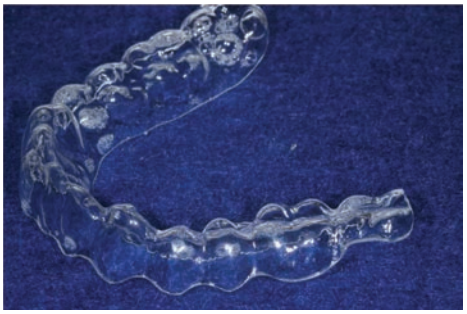
Class II Cuspid
Class II Molar

Labially Displaced Cuspid

Neocrystal Brackets 0.14 Copper NiTi DLX

Carriere Motion Appliance Arm Mesial 1/3 Cuspid to Middle First Molar Lower Essix Bracket Lower First Molar

Carriere Motion Appliance



Lower Essix Will Prevent Flaring Lower Incisors

Lower Essix Brackets First Molars

Carriere Motion Appliance

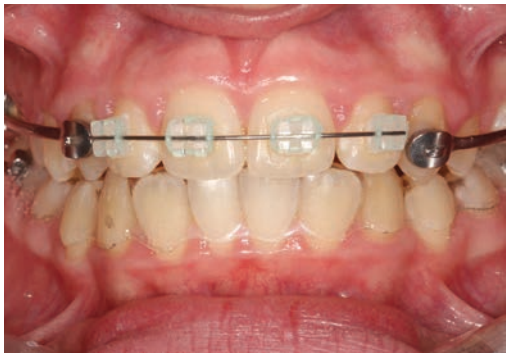
Force 2 Elastics Cuspid to Molar

Class II Cuspid
Class II Molar

4 Months
Class I Cuspid Class I Molar

Overjet 4mm

Deep Overbite High Cuspids



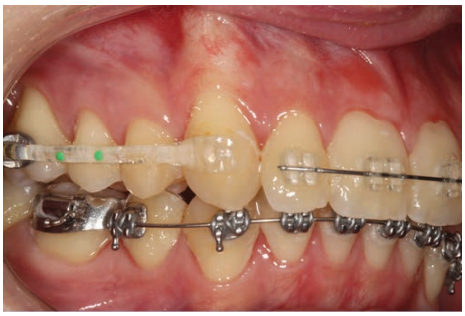
Normal Overbite Straight Teeth

Normal Overjet

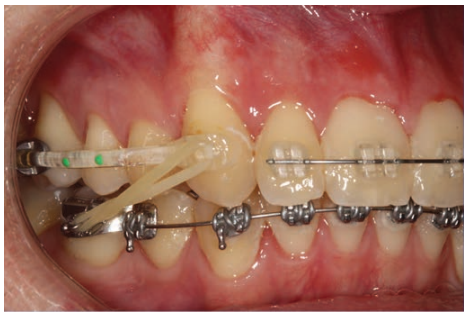
Treatment Time	
Phase I	Objective align labially displaced cuspids Neocrystal Clear Brackets .018 Copper NiTi DLX archwire 4 Months
Phase II	Objective Correct Sagittal First Correct Class II cuspid, Class II molar Class II Carriere Motion Appliance 4 Months
Total Time	**8 Months**

Clear Motion Appliance

Neocrystal Clear Brackets



Clear Motion Appliance
Cuspid To Molar



Clear Motion Appliance
Class II Elastic 6 oz

Clear Motion Appliance
Clear II Elastics 6 oz

Clear Motion Appliance

Special Acknowledgement

Special acknowledgement to Dr. Luis Carrière, orthodontist from Barcelona, Spain for introducing the orthodontic profession to the Carriere Motion Appliance.

Reference

Lamons F.F., Holmes C.W., 961. The problem of the rotated maxillary first permanent molar. American Journal of Orthodontics, 47(4), pp.246-272.