

THE RICK-A-NATOR APPLIANCE

by Dr. Brock Rondeau

To treat patients in the 1990's the orthodontic practitioner must have a knowledge of orthopedics, orthodontics and TMJ. Since the health and integrity of the TMJ must be one of the primary goals, practitioners must try and establish the correct condylar position and the correct condyle-fossa relationship. To help establish the correct relationship of the mandible to the maxilla, clinicians have been using a variety of mandibular anterior repositioning splints as well as numerous mandibular repositioning orthopedic appliances.

One such mandibular repositioning appliance that I have been using in my practice for the past two years is the Rick-A-Nator. The Rick-A-Nator does a superb job of solving mandibular deficiency and vertical deficiency in a short treatment time with very stable results. When you achieve functional

and skeletal stability, you have a much greater chance of achieving dental stability.

Since the 1930's, functional appliances have been used extensively in Europe for the treatment of orthopedic and orthodontic problems. Many of the appliances, while effective, rely heavily on patient co-operation. One main advantage of the Rick-A-Nator is that it takes the control of the wear time of the appliance out of the hands of the patient and allows the doctor to control the treatment.

Another main advantage of the Rick-A-Nator is that it can be worn in combination with the Straight Wire Appliance which results in significant shortening of the total treatment time.

The Rick-A-Nator is a very simple appliance which consists of two maxillary first molar bands attached to an acrylic anterior repositioning split via two .036 connector wires.

Figure 16L



OCCUSAL VIEW RICK-A-NATOR (Dyna Flex)

Figure 16R



FRONTAL VIEW RICK-A-NATOR

Parts of RICK-A-NATOR

1. 2 Molar Bands with Lingual Attachments
 - a) Fixed (soldered)
 - b) Mia attachment (mesial direction)
 - c) Mershon attachment (vertical direction)
2. .036 Connector Wire from Molar Bands to Incisal Ramp
3. Incisal Ramp (clear acrylic)

Figure 17L



OCCUSAL VIEW RICK-A-NATOR

Figure 17R



FRONTAL VIEW RICK-A-NATOR

Preparation of MAXILLARY ARCH

- | | |
|----------------------|--|
| 1. Constricted | Slow Palatal Expander
Schwarz Plate
Rapid Palatal Expander
Bonded Hyrax |
| 2. Class II Div. 2 | Utility Arch
Anterior Sagittal |
| 3. Flared Anteriors | Detorque Labial Bow
Detorque Anterior Chain
(Straight Wire) |
| 4. Crowded Anteriors | Align with Straight Wire |

With the orthopedic, orthodontic, TMJ approach to treatment, the key is the proper development of the maxillary arch. Once this has been achieved the mandible is advanced to meet the ideal maxillary arch.

Any discussion regarding orthopedic (functional) appliances must also involve airways. The patient cannot wear any functional appliance unless he/she is a normal nasal breather. If the patient has a constricted maxilla or a compromised

airway, the problem must be rectified. Some solutions include expansion or development of the maxilla, the treatment of allergy problems or surgical removal of the adenoids. In many of these cases, a consultation appointment must be set up with an E.N.T. specialist. Suffice it to say, this problem must be addressed prior to the utilization of the Rick-A-Nator or any functional orthopedic appliance.

Construction of the RICK-A-NATOR

1. Place separators for maxillary molars (3 days prior to appointment).
2. Fit bands tightly on maxillary molars.
3. Remove bands.
4. Take impression of maxillary arch (without bands in place).
5. Take impression of mandibular arch.
6. Pour impressions in yellow stone.
7. Send upper and lower working models and bands to the lab.
8. Place separators for maxillary molars.

Figure 18L



CONSTRUCTION BITE RICK-A-NATOR

Figure 18R



Construction Bite for the RICK-A-NATOR

WAX BITE RICK-A-NATOR

Select a piece of baseplate wax which is precut to a thickness of 5-6 mm. Cut out a notch in the anterior portion so that when the patient occludes into the wax in a more protrusive position there will be no wax covering the anterior teeth. The baseplate wax is then heated uniformly in a water bath at 139°F. When advancing the mandible with your construction bite, it is important to ensure that you come straight forward with no deviations to the right or left. Otherwise, you might cause TMJ problems by displacing one condyle too far anteriorly and the other condyle too far posteriorly. One key is to use the labial frenums to identify the skeletal midlines. It is important to use these skeletal midlines as your guide to advancing the mandible. Dental midlines must not be used when advancing the mandible. After the orthopedic movement has been achieved, the Straight Wire Appliance will be utilized to correct any dental midline discrepancies.

Mark the anterior teeth with pencil lines which correspond to the skeletal midlines to ensure that the patient brings the mandible straight forward during the construction bite. Ask the patient to advance the mandible 4-5 mm. and have them repeat it several times. Provide them with a hand mirror so they can practice this movement prior to the insertion of the wax bite. If the original problem was a deep overbite with a 5 mm. overjet, have the patient advance to an end to end position. This would result in 5-6 mm. of space between the posterior teeth depending on the curve of Spee. The uniformly heated baseplate wax is inserted and the patient is instructed to close into the ideal position as discussed above. The wax is then removed from the mouth and chilled in cold water. Put the patient's name on the wax and send it to the lab with the molar bands and the working models. The lab will then be able to fabricate an appliance which places the mandible in a new anterior position.

Types of RICK-A-NATORS

When constructing the Rick-A-Nator, the clinician must decide whether the appliance is to be fixed or fixed-removable.

a) **FIXED ATTACHMENT**—The fixed type has the .036 wires soldered directly to the lingual of the molar bands. One

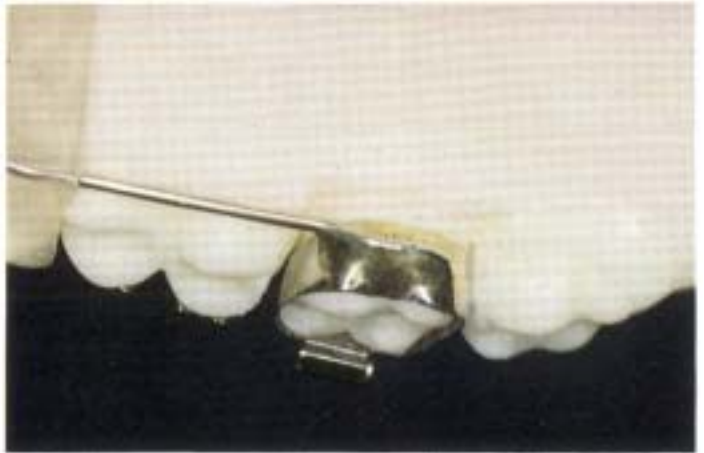
important advantage of this type is that the patient cannot remove the appliance and thus you are assured of 24 hours of weartime. Also, with the fixed type there is less breakage and the appliance is more stable.

Figure 19L



SOLDERED ATTACHMENT (Dyna Flex)

Figure 19R



SOLDERED LINGUAL MOLAR BAND

b) **MIA ATTACHMENT**—The female part of the mia attachment is soldered to the lingual of the molar band. The male part of this attachment is soldered to the .036 connector wire and fits into the female part from the mesial. After the molar bands are cemented, the appliance can easily be removed by the patient as well as the clinician in a mesial direction.

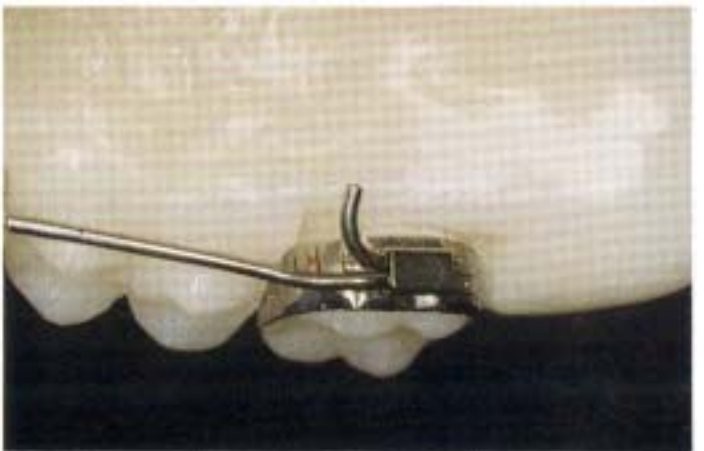
The disadvantage of the fixed type is that if the patient wants to remove the appliance to eat or clean it they cannot. Also, if the clinician wants to remove the appliance so it can be relined with acrylic, this cannot be done without first removing the previously cemented molar bands. For these reasons, I prefer the fixed-removable type of Rick-A-Nator.

Figure 20L



MIA ATTACHMENT (Dyna Flex)

Figure 20R



MIA ATTACHMENT

c) **MERSHON ATTACHMENT**—The female part of the mershon attachment is soldered to the lingual of the molar band. The male part is soldered to the .036 connector wire and fits into the female part from the vertical. This attach-

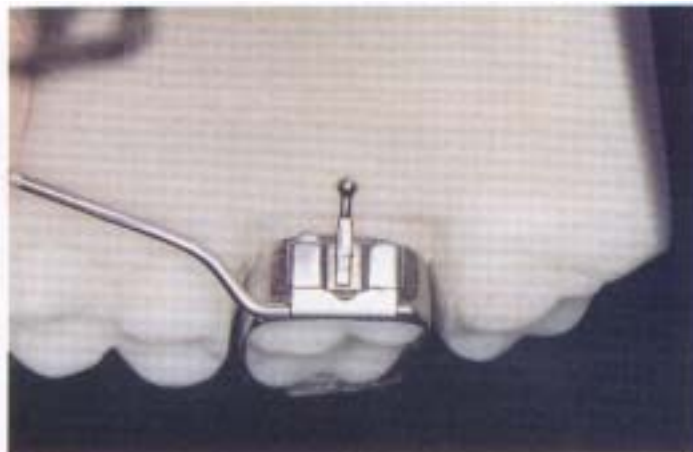
ment enables the clinician to remove the appliance with relative ease but makes it more difficult for the patient to remove it. The appliance is removed in a vertical direction.

Figure 21L



MERSHON ATTACHMENT (Dyna Flex)

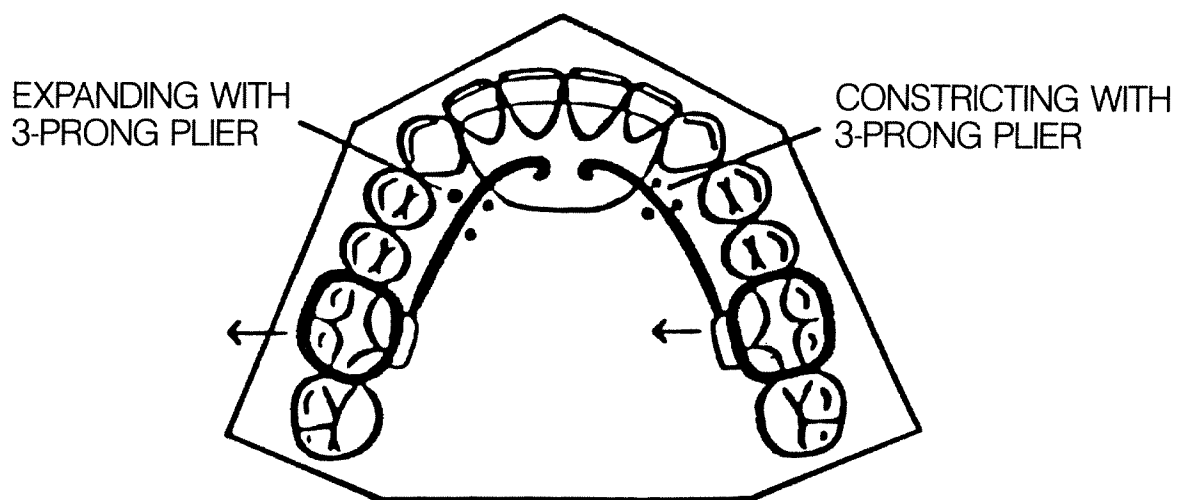
Figure 21R



MERSHON ATTACHMENT

When the Rick-A-Nator comes back from the lab, it is tried in the mouth to check the fit and position of the incisal ramp. This incisal ramp must be partially tooth-born and partially tissue-born and must contact the lingual of the six anterior teeth as well as the palatal tissue lingual to the six anteriors. If

the acrylic incisal ramp is completely tissue-born it can result in irritation of the tissues; if totally tooth-born it may cause flaring of the anterior teeth. The Rick-A-Nator can be adjusted to either expand or constrict the connector wire with the 3-prong plier.

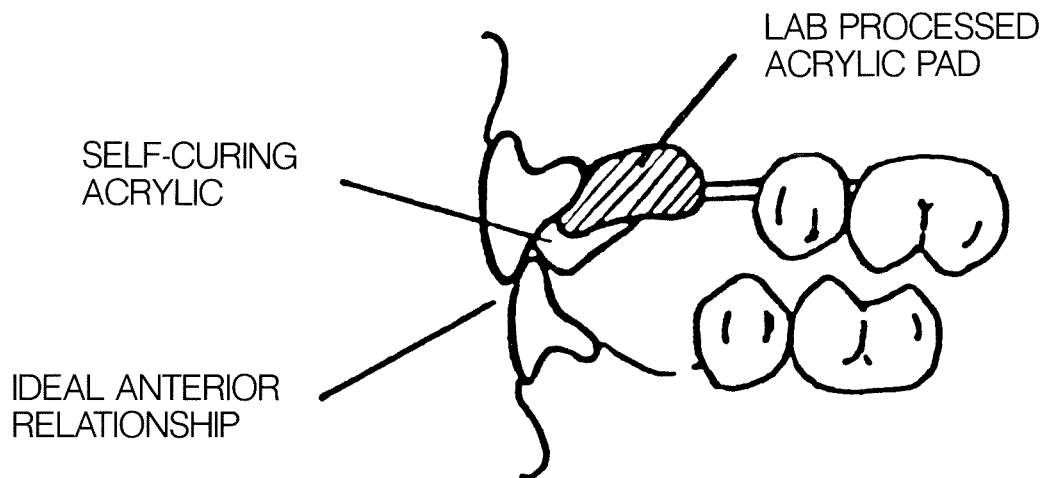


Technique for Adding Self Curing Acrylic

1. Remove the appliance.
2. Roughen up the acrylic ramp with an acrylic bur.
3. Coat surface with liquid monomer.
4. Mix liquid monomer and powder.
5. Add to processed acrylic ramp.
6. Insert Rick-A-Nator.
7. Have patient bite in predetermined position.
8. Allow acrylic to set.
9. Remove from mouth and trim.

One important function of the Rick-A-Nator is that it may be used to correct minor dental crossbites by expanding the connector wires as shown above.

Frequently, despite the clinician taking an accurate construction bite, the incisal ramp must be relined with a self-curing hard acrylic. One such product would be Lang's Flexicryl Hard Acrylic (Clear).



After the incisal acrylic ramp has been relined, the Rick-A-Nator may be cemented after blocking out the buccal tubes and lingual sheaths (fixed-removable type) with orthodontic wax. It is better to cement the Rick-A-Nator in one piece to ensure easy removal later on if the fixed-removable type is made.

The incisal ramp is the key to mandibular advancement and the establishment of proper condyle-fossa relationship. To achieve this important orthopedic movement, the patient must be instructed to always close anterior to the incisal ramp. If they close posterior to the ramp, the overjet will actually increase as the condyles become more posteriorly displaced. If the patient has an overjet of 10 mm. it is imperative that you only advance 5 mm. the first time you relined your incisal ramp with your initial construction bite. Otherwise, if you try and advance the mandible 10 mm. the first time the appliance is inserted, the patient will not be able to occlude anterior to the ramp and your treatment will not be successful.

If the incisal ramp is made correctly the patient will occlude anterior to the ramp 2,000 times per day when they swallow. After 2-3 months you may remove the ramp, advance the mandible another 5 mm. if necessary to place the mandible in the ideal position with the maxilla. Your treatment will be much more successful if you correct your 10 mm. overjet problem in two stages as outlined.

Advantages of RICK-A-NATOR

1. Doctor has total control as the appliance is fixed.
2. Can be worn with Straight Wire Appliance.
3. Very esthetic (clear acrylic difficult to detect).
4. Much easier to speak as compared to Bionator or Bio-Finisher.
5. Worn 24 hours per day.
6. Lab fees less than Bionator or Bio-Finisher.
7. Patients prefer this to all other functional appliances.

Disadvantages of RICK-A-NATOR

1. Sometimes appliance fractures at lingual sheaths.
2. Tissue irritation can occur.
3. Slight alteration of speech initially.
4. More difficult to hold mandible forward than with Bio-Finisher which has an anterior acrylic cap.

5. Difficult to eat certain foods.
6. Spaces open up between upper and lower anteriors.
7. Lower anteriors sometimes become loose.
8. Increases lower face height; therefore contra-indicated in skeletal open bite patients.

Clinical Results of RICK-A-NATOR

1. Advances the mandible.
2. Improves the profile.
3. Reduces the submental crease.
4. Corrects Class II skeletal to Class I skeletal.
5. Reduces the overjet.
6. Eliminates the deep overbite.
7. Re-establishes the correct posterior vertical dimension.
8. Erupts the posterior teeth.
9. Increases the height of the posterior alveolar processes.
10. Eliminates the deep curve of Spee.
11. Improves the health of the TMJ.
12. Reduces the trigger points.
13. Moves the condyles closer to the Gelb 4/7 position.

Determination of Proper Vertical Dimension

I do not think that you can overemphasize the importance of proper posterior vertical dimension in terms of a healthy TMJ or in terms of a successful orthodontic case. If the vertical dimension is not adequate, then the muscles that open and close the jaw, including the masseters, are too short and they cannot function properly. When the muscles are too short, this is one of the clinical signs of bruxism, clenching, etc. These muscles are constantly in a state of partial contraction so they will not go into spasm.

The clinician must palpate the muscles carefully around the TMJ, head and neck area and check for trigger points. The presence of numerous trigger points is a sure sign that there is a problem with lack of adequate posterior vertical dimension. Once the teeth have been erupted to their proper vertical dimension, then the muscles increase to their proper resting length, the problems of muscle contractions and trigger points are eliminated and the orthodontic result is more stable.

Correction of Vertical Problems

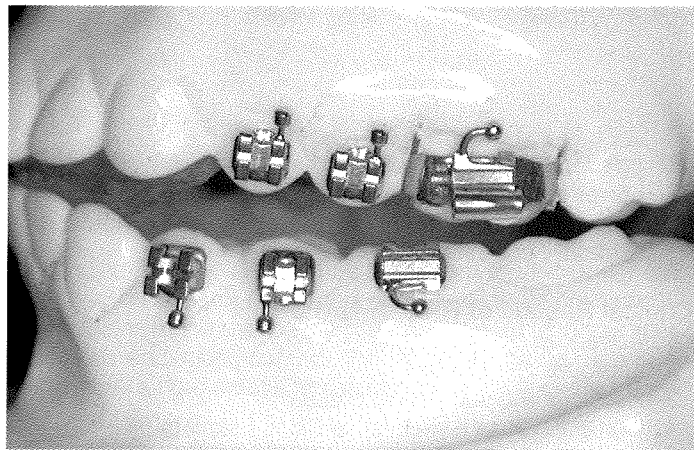
The Rick-A-Nator is an excellent appliance to help increase the posterior vertical dimension by attaching vertical elastics to the posterior teeth and increasing the height of the posterior alveolar processes. When vertical elastics are attached to the posterior teeth, the posterior teeth are not extruded and, in fact, the crown root ratio does not change.

The alveolar ridge tends to increase in height with the stimulation of the vertical elastics; the analogy being that because of the lack of adequate vertical dimension, the entire ridge or alveolar process is in a depressed vertical position. The only time this does not happen is when teeth are ankylosed, ectopic eruption, and when the teeth are infra-erupted

within the alveolar process. In these cases, the alveolar bone does not migrate with the eruption of the teeth until proper clinical crown height is achieved and then the alveolar migration begins.

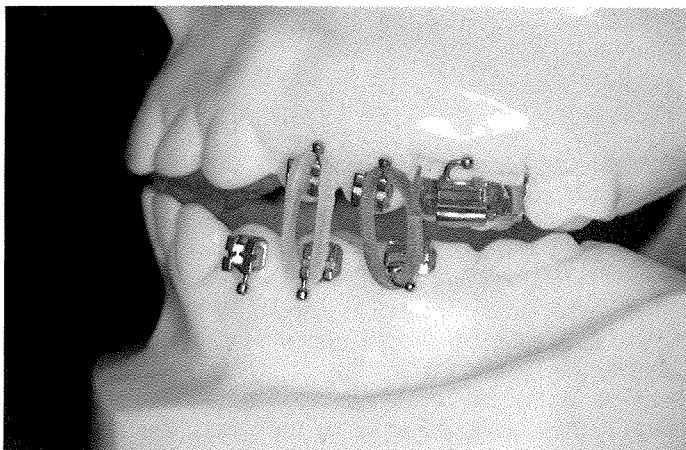
- a) **DEEP CURVE OF SPEE**—If the patient has a deep curve of Spee, you want more eruption of the mandibular posterior teeth than the maxillary posterior teeth to correct the problem. The technique employed for the eruption of the posterior teeth would be to attach vertical elastics. Ideally, these elastics could be attached to hooks soldered to the brackets (Ormco bicuspid brackets with hooks). Otherwise, K-hooks (Kobayashi hooks) could be attached to the brackets and used to help erupt the teeth.

Figure 22L



MOLAR HOOKS ON BRACKETS (Ormco)

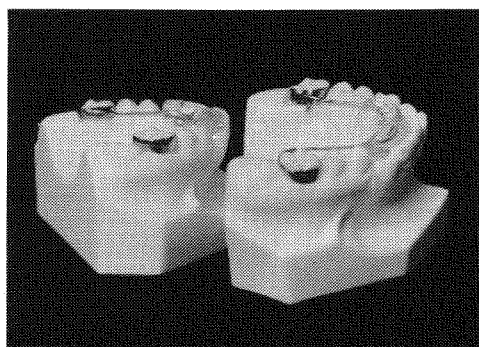
Figure 22R



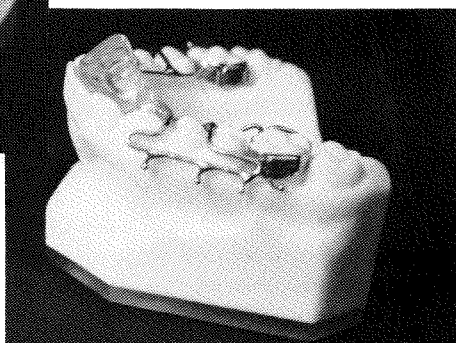
VERTICAL ELASTICS

RICK-O-NATOR

THE DOCTOR HAS CONTROL



RICK-O-NATOR



BROCK-A-NATOR

The Brock-A-Nator is designed to enhance vertical by utilizing elastics from the buccal bars to the lower posterior teeth.

DYNA FLEX^{LTD.}
LABORATORIES

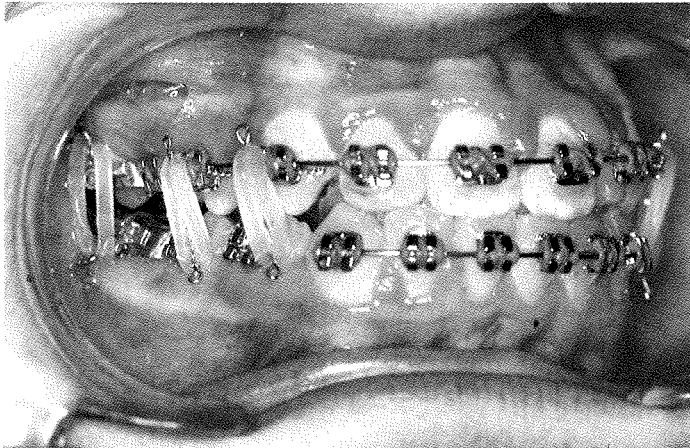
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Toll Free in U.S. and Mo. 1-800-444-0495
St. Louis 426-4020

Elastics utilized are 3/16" 8.oz. Cougar (Ormco). If you want more eruption of the mandibular posterior teeth than the maxillary, then place a rigid rectangular wire on the maxillary arch from molar to molar. On the mandibular arch, place a lighter wire from cuspid to cuspid and have no wire distal to the cuspid. Then when vertical elastics and eruptive forces are

applied the maxillary posterior teeth will have more anchorage and therefore will be less likely to move. Since most of the force is against the mandibular posterior teeth, they erupt and the mandibular alveolar process increases in height and this flattens the curve of Spee.

RICK-A-NATOR Eruption Lower Posteriors (Deep Curve of Spee)

Figure 23L



VERTICAL ELASTICS
3/16" 8 oz. Cougar (Ormco)

MAXILLARY ARCH .019 × .025 TMA $\frac{6}{3} \mid \frac{6}{3}$ (Ormco)

MANDIBULAR ARCH .018 TMA $\frac{3}{3} \mid \frac{3}{3}$ (Ormco)

Vertical Elastics 3/16" 8 oz. Cougar (Ormco)

b) FLAT CURVE OF SPEE

If the patient presented with a flat curve of Spee with a deep overbite, you would correct this problem by erupting both maxillary and mandibular posterior teeth simultaneously with vertical elastics. Braided rectangular wires are worn on the maxillary and mandibular arches, so that both maxillary and mandibular alveolar processes move simultaneously when vertical elongation forces are applied.

RICK-A-NATOR ERUPTION POSTERIOR TEETH (FLAT CURVE OF SPEE)

MAXILLARY ARCH .019 × .025 Force 9 $\frac{6}{3} \mid \frac{6}{3}$ (Ormco)

MANDIBULAR ARCH .019 × .025 Force 9 $\frac{6}{3} \mid \frac{6}{3}$ (Ormco)

Vertical Elastics 3/16" 8 oz. Cougar (Ormco)

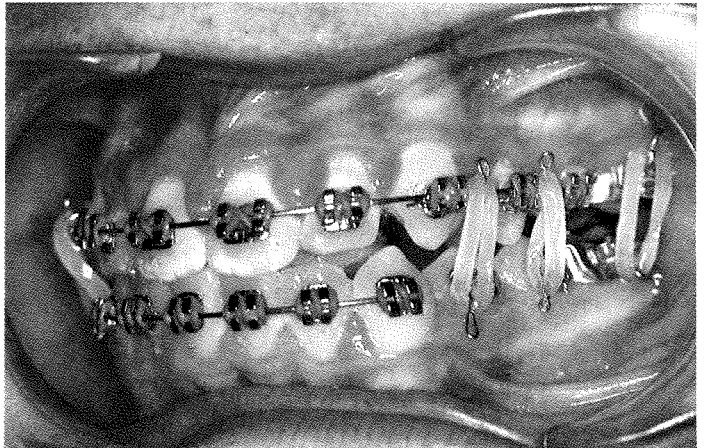
Rationale for Using RICK-A-NATOR

Before making the decision to use the Rick-A-Nator, the clinician must decide what philosophy of treatment he wishes to employ for the treatment of his patient. The choice is conventional versus functional treatment.

Rationale for Conventional Treatment:

1. Lower arch is the key.
2. Overjet is due to a protruded maxilla.

Figure 23R



VERTICAL ELASTICS
(Attached to K-Hooks)

3. Crowding is due to oversized teeth for the size of the jaws.
4. Solution would be extraction of bicuspid or cervical facebow headgear or Wilson distalizing arch.
5. Excessive overbite is due to over-erupted incisors.
6. Solution would be to intrude incisors to correct overbite.
7. Align the teeth in the lower arch.
8. Move the maxilla to fit the mandible.

Rationale for Functional Treatment:

1. Upper arch is the key.
2. Overjet is due to a retruded mandible.
3. Solution would be to advance the mandible with a functional appliance.
4. Crowding is due to constricted dental arches.
5. Solution would be to develop the dental arches with expansion appliances.
6. Excessive overbite is due to an overclosed vertical dimension.
7. Solution would be to hold the incisors, erupt posterior teeth and alveolar processes.
8. Align the teeth in the upper arch.
9. Move the mandible to fit the maxilla.

The key to proper orthodontic treatment is diagnosis. The revelation by McNamara and Moyers that approximately 80% of Class II malocclusions have retrognathic mandibles is very clinically significant. If 80% of these mandibles are retrognathic, how can we continue to apply mechanics which cause a retraction of the maxilla? It seems only logical that if the maxilla is normal and the mandible is retrognathic, we concentrate on trying to move the mandible forward. Therefore, rather than retractive orthodontics which distalize the maxillary teeth, we should be utilizing anterior repositioning splints and functional (orthopedic) appliance to advance the mandible. It is time in orthodontics to stop making a diagnosis

based on the position of the lower incisor and start considering the profile and the health of the TMJ as our main diagnostic criteria.

Condylar Position

I think one of the keys to practicing successful orthodontics is to find and maintain correct condylar position during orthodontic treatment. If the disc is to stay on top of the condyle, it is vital that the condyle remain in the middle of the fossa and not be distalized. If the condyle is distalized, you run the risk of the disc moving anteriorly and medially.

Clinically, if the condyle is posteriorly displaced, it can compress the nerves and blood vessels in this area and cause headaches, neckaches, earaches, and problems around the eyes as well. This posteriorly displaced condyle can also cause the muscles in the head and neck area to overwork through continuous contractions which results in several trigger points becoming evident when palpated by the clinician.

Orthodontic practitioners must palpate these muscles regularly to ensure that the treatment plan which is being utilized is affecting the TMJ in a positive manner. When you have a reduction in the number of trigger points, the patient is telling you that your treatment is progressing in the right direction. Conversely, if there is an increase in the severity of the trigger points then perhaps it is time to consider another treatment option. My clinical experience has convinced me that my patients have fewer trigger points and healthier TMJ's when treated with the functional approach.

If the condyle is too far distally and the disc is anteriorly displaced, this can lead to a restriction in interincisal opening (normal interincisal opening is 48-52 mm), restriction of lateral movement (normal lateral movement is 12 mm), deviation to the side of the displaced disc, and sometimes clicking or crepidus, or pain.

As well as trigger point examinations, it is extremely important that these range of motion measurements be taken for TMJ patients prior to, during and after orthodontic treatment so that you can monitor your progress throughout treatment. Obviously, if your signs or symptoms are increasing during the treatment, you would then want to modify your approach.

Summary & Conclusion

It has been estimated that approximately 60% of orthodontic patients prior to treatment exhibit some signs or symptoms of

TMJ disorders. Therefore, it behooves the orthodontic practitioner to document these signs and symptoms before, during and after treatment. My opinion, based on 14 years of clinical experience of treating hundreds of orthodontic patients, is that you can indeed affect the TMJ either positively or negatively, depending on your treatment technique.

If you practice what some clinicians call retractive orthodontics, which includes the retraction of anterior teeth, cervical facebow headgear, bicuspid extraction, constricted maxillary arches, and vertical maxillary incisors, you will then affect the TMJ negatively. On the other hand, if you develop the dental arches with orthopedic appliances, eliminate the airway problems, advance the mandible with orthopedic appliances, develop the posterior vertical dimension with the eruption of the posterior teeth, then you will positively affect the TMJ.

In treating cases in the permanent dentition, it is sometimes advisable to go to Phase I therapy first. Use a diagnostic splint prior to orthodontic treatment to help you determine that you are on the right track. If the patient's TMJ signs, symptoms and trigger points diminish with the use of the anterior repositioning splint, you know you are heading in the correct direction. This way you can determine your final treatment position before you start. Using the splint as a blueprint, you then move the teeth and jaws to that predetermined position.

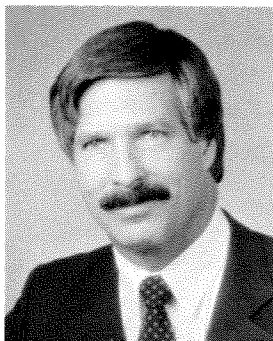
The Rick-A-Nator appears to be an excellent appliance for solving the problem of mandibular deficiency and vertical deficiency in a relatively short treatment time.

My philosophy of orthodontic treatment is to employ a combination technique of functional appliances and fixed therapy. The functional appliance of choice, being the Rick-A-Nator, is used to correct the functional and skeletal problems. Then the Straight Wire Appliance is used to fine tune the occlusion. In the case of Class II skeletal malocclusion with normal maxilla, retrognathic mandible and deep overbite, this would involve advancing the mandible and erupting the posterior teeth and posterior alveolar processes. The case would be completed with the Straight Wire Appliance in an attempt to achieve Andrews "Six Keys of Occlusion", but only after you have established other treatment objectives which include a healthy TMJ, good profile and Class I skeletal relationship using a functional appliance.

The Rick-A-Nator has been the most effective appliance that I have used in my practice in the last two years, for helping me achieve my treatment objectives.

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Dr. Brock Rondeau

Dr. Brock Rondeau, Diplomate of the International Board of Orthodontics, past president and certified instructor of the IAO (International Association for Orthodontics), has completed more than 1,500 hours of postgraduate orthodontic training and has more than 600 active orthodontic patients. Dr. Rondeau is currently one of Canada's most sought-after clinicians and has taught orthodontics to well over 1,200 dentists in Canada and the U.S. During the past 8 years Dr. Rondeau has lectured extensively in 10 cities in Canada and 9 cities in the U.S.