Keys To Bite Opening

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Keys to Bite Opening
Keys to opening deep bites

- Incisal bracket position in anterior
  - Bond composite to occlusal surface of lower molar if bracket interferences will be a problem
- Force
  - Deep bite patients are usually strong muscled; heavy forces are often needed
    - Deep curves, tipbacks, time in heavy arch wires
Bite Opening- General Considerations

- Rocking chair curve or tipback bends.
- When do you use one or the other?
- In what situations are curves ineffective?
Bite opening guidelines. If the bite is...

- 2-5 mm bite depth-straight wires. Use differential bracket positioning to get bite open
- 5-8 mm bite depth- Use reverse and compensating (rocking chair) curves
- 9mm or greater bite depth- Use incisor intrusion mechanics
Rocking Chair Curves

- 5-8mm overbite
- Low maxillary and mandibular zones
- Normal gingival display (no gummy smile)
- Small lower anterior face height
Maxillary and Mandibular Zones

• Occlusal line superior- Line from incisal edge of upper central incisor to MB cusp tip of upper 1st molar
• Occlusal line inferior-Line from incisal edge of lower central incisor to MB cusp tip of lower 1st molar
Maxillary Zone

- O line superior to Palatal plane (ANS-PNS)
- Average value-10 deg.
- If > 15 deg., consider upper incisor intrusion
Mandibular Zone

- O line inferior to Mandibular plane (Go-Gn)
- Average value-20 deg.
- If > 25 deg., consider lower incisor intrusion
Normal face height measurements
Lower Anterior Face Height

- Erupting molars increases lower anterior face height
Example

- Lower anterior face height is small.
- Molar extrusion (curves) will be the best way to open the bite
Action of curves

- Erupt bicuspids
- This leads to molar eruption, so net effect is bite opening via molar eruption
Side-effects of curves

- Incisor flaring
  - Expressed more on upper incisors than lower
- Loss of molar crown torque
- The heavier the wire, the more the side-effects are expressed
  - Try to open the bite completely in .014 and .016 stainless steel wires
Clinical Response to Curves

- Anteriors - intrusive force results in crown FLARING
- Molars - eventually force is extrusive; net result is LINGUAL crown movement
REMEMBER THIS

• Intrusive force results in forces that encourage labial crown movement (flaring).
• Extrusive force results in forces that encourage lingual crown movement.
• These movements are not always expressed, but the forces are always present.
Important Points

• Understand the relationship between a narrow upper arch and a Class II molar relationship
• If rocking chair curves tend to narrow the posterior portion of the upper arch, expansion of the upper arch is often needed to counter the side-effects of curve and avoid worsening of Class II occlusion while using curves
Protocol for use of curves

• .014 stainless steel-deep curve
  – Wire passively placed in molar tubes rests 10-14mm into vestibule

• .016 stainless steel- moderate curve
  – Wire passively placed in molar tubes rests 8mm into vestibule

• .020 stainless steel-light curve
  – Wire passively placed in molar tubes rests 4mm into vestibule
.014 st. steel engaged in molar tubes. Check distance from gingival margin to wire to determine if depth of curve is correct.
Example
After going through wire progression, if bite is still not open...

- Increase curve in .020
  - Leave it in for a couple of months
- Check bracket position
- Go to tipback (intrusion) mechanics
Method of curving wires

• Step 1
  – Fit wires into patient’s mouth
  – Cut wires so they are 1 inch too long
    • Insures that curved part of the wire won’t be cut off later
Step 2

- Use hollow chop pliers to place curve in the wire
  - Start at canine and work posteriorly
Step 3

- Fit wire in patient’s mouth
- Let it sit passively in anterior and make sure the amount of curve is correct
Step 4

• Place wire into the brackets, tie in, and cut excess
  – Some practitioners advocate bendbacks to prevent incisor flaring
Clinical Application

- When are curves ineffective in opening bites?
Answer:

- The more lingually tipped the incisors are, the more difficult bite opening becomes with curves.
- Why?
Subtractive Forces

Let's see why
Place curve into an archwire. You get these forces

- Extrusion of the bis and intrusion of the incisors is what we want. But that is not all that happens
- Place the wire into the incisor slot and we get...
Subtractive forces

- This results in extrusion of the incisors and intrusion of the bicuspids.
- In this situation, “bad” forces (green) are smaller than “good” forces (purple), so bite opening occurs.
- However, when incisors are lingually inclined...
This happens

- Extrusive force on incisors and intrusive force on bicuspids increases.
- The subtractive forces cancel, leaving essentially a gable bend pointing occlusally
Result

- No net intrusion or extrusion
- Roots move mesially (on lower arch), thus increasing Class II relationship

Double-click to add an object
Summary

- Reverse curve not always effective
- Retroclined incisors make curve ineffective
- Roots on lower posterior tip mesially (Class II worsens) and bite doesn’t open
- Similar response as gable bend (pointed occlusally)
Retroclined incisors means more lingual root torque which means subtractive forces so vertical forces cancel
Solutions!!
Off-Center (tipback) bends

Let's explore the mechanics of off-center bends
Gable Bend Vs Tipback bend

- Gable-symmetric V-bend
- Equal and opposite forces
- Vertical components cancel

- Tipback- asymmetric V-bend
- Different angle of entry in both slots means vertical forces are not cancelled
- Net extrusive/intrusive force remains
Understanding tipbacks

- What direction of force (intrusive or extrusive) will be exerted on the molar?
- What direction of force (intrusive or extrusive) will be exerted on the canine?
Understanding tipbacks (cont.)

- What direction of force (intrusive or extrusive) will be exerted on the molar?
- What direction of force (intrusive or extrusive) will be exerted on the canine?
Answer-Intrusive on the canine
Extrusive on the molar

Notice: both set-ups are the same; the wire is engaged differently.
Off-center bend rule

- When the short segment of the wire is placed into the bracket first, the long section will point in the direction of the force produced at the opposite bracket.
Off-Center Bend, Continued

- If the long section is placed into the bracket first, the short section will point opposite to the direction of force produced at that bracket.
Net effect of off-center bend

• Extrusion and distalization of short segment tooth (usually the molar)
• Intrusion of long segment tooth (usually incisor)
• Since most patients who need intrusion mechanics are strong muscled patients, the extrusive component usually is not expressed as much as the intrusive component
Intrusion set up

- 2 x 4 set-up (2 molars and 4 incisors are bracketed)
- Tip back mesial to molars
- .016st steel wire 16mm into vestibule provides 100 grams of force

Check force level by letting the wire sit passively in the vestibule
Side effects of tip back mechanics

- Anterior teeth flaring-the greater the distance between the point of force application and the tooth’s center of resistance, the more flaring that will occur
Example

• Note how potential for flaring increases when the tooth is already flared
Molar extrusion

- Strong muscled patients- muscles overpower wire's extrusive force
- Weak muscled patients- wire's extrusive force overpowers the muscles
Curves vs. Tip-backs, Continued

- **Curves**
  - Extrude molars
  - Good for 5-8mm of bite opening
  - Use when gingival display is normal
  - Use when Mx and Mn zones are normal
  - Use when LAFH is small

- **Tip-backs**
  - Intrude incisors
  - Good for 9mm and greater of opening
  - Use when gingival display is excessive
  - Use when Mx and/or Mn zones are high
  - Use when incisors are lingually inclined
Tipbacks to open the bite
Mixed dentition protocol

• 2x4 set-up
  – 4 incisors plus 2 molars bracketed
  – Wire must bypass lateral segment
    • Long and short wire segment provides differential force to open bite