

Today's plan

8:00-8:30 Review anatomy of mandibular molars

Review C&S and apical gauging

8:30-11:45 Projects

Mandibular Molar- access, C&S, obturate

11:45-12:00 Review

Next Week plan

Clean up

Next Week

Theme: Favorite Hat Day

Continue mandibular molar- access, C&S, obturate

Catch up

Mount maxillary molar

Words of Wisdom

- Use 21 mm files when ever possible
- Use cusp tips for reference points
- Take WL and master cone radiographs with all files/cones at same time
- Plugger fitting in multi-canaled teeth
 - Only have 2 System B pluggers, so write down the binding points for each canal
 - Do the same for the 1st hand plugger to be used
- Do not use Gates Gliddens prior to establishing a glide path
- Fit pluggers <u>before</u> master cones
- Gutta percha to 1mm from orifice (see page 68)

Mandibular 1st Molars

- 3 Canals 59% (2 mesial, 1 distal)
- 4 Canals 30% (2 mesial, 2 distal)
- 5 Canals, up to 20% (3 mesial, 2 distal)
 - 2 Canals, Very Rare

Beware of merging canals!!

Mandibular 2nd Molars

Usually 2 Roots and 3 Root Canals- 75%

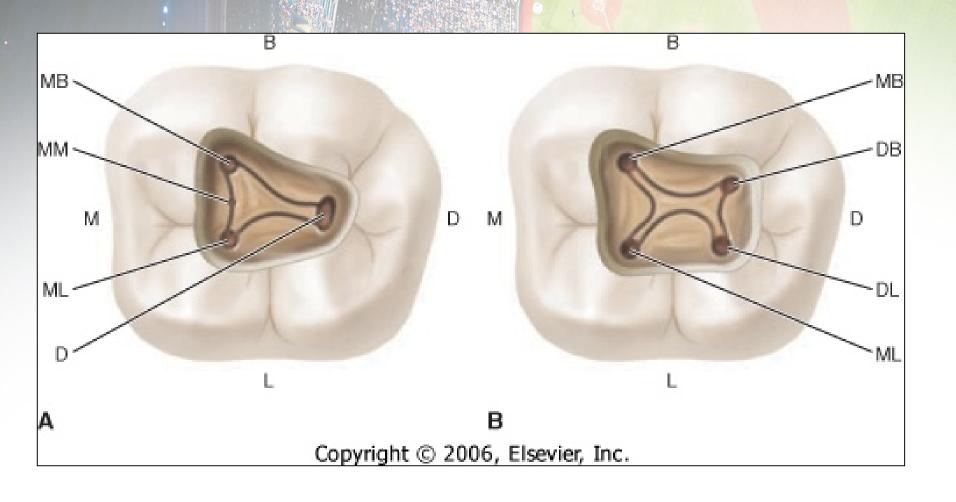
Variations

- 2 Root Canals- 10%
- 4 Canals (2 mesial, 2 distal)- 10%
 - C-Shaped Root Canals-2-3%
 - 1 Canal- 2-3%

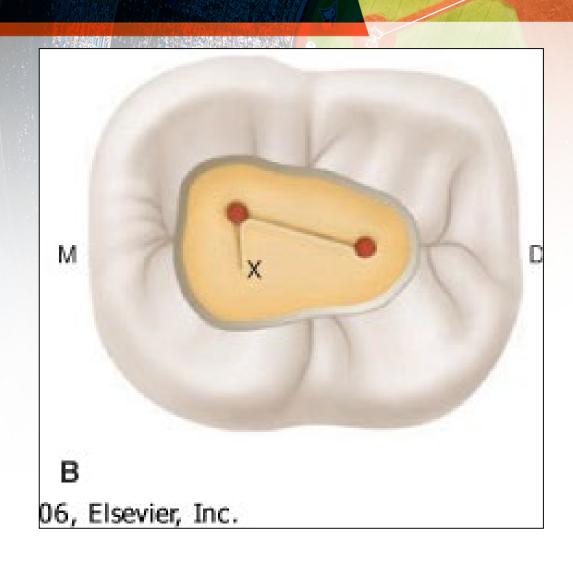
Access Preparation

- Think
 - Centrality
 - Concentricity
 - Symmetry
- Occlusal Outline Form?
 - Shape? Triangular? Trapezoidal?
 - Determined after complete preparation
 - Start triangular and alter as needed (trapezoidal)
 - Number of canals, location of orifices at "corners" of access
 - After smooth access walls

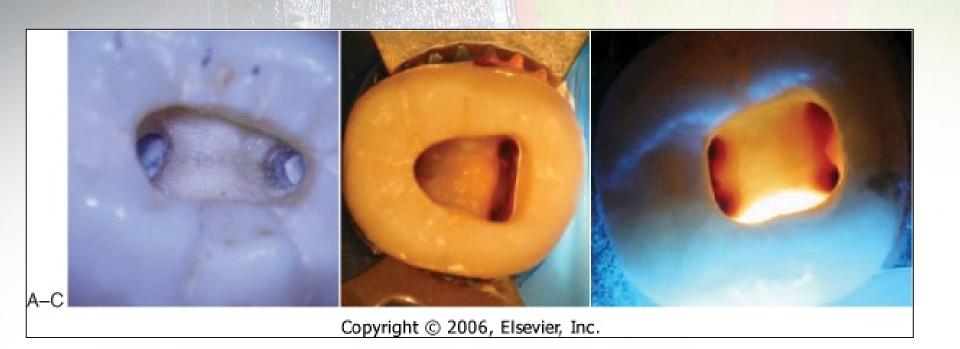
Orifices - Symmetry

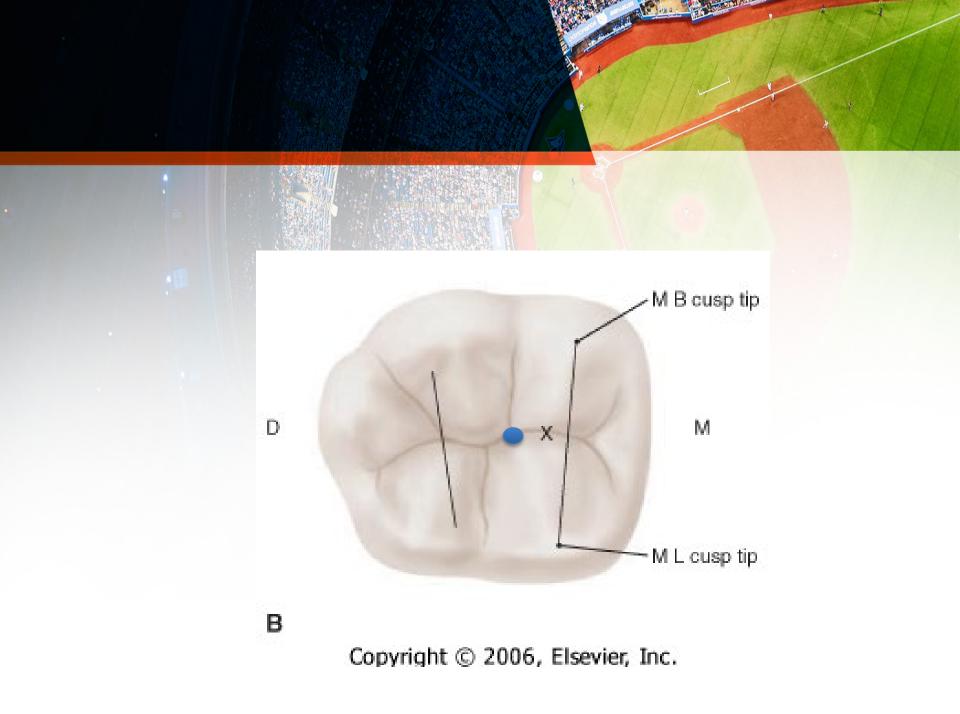


Asymmetry - Missed Canal



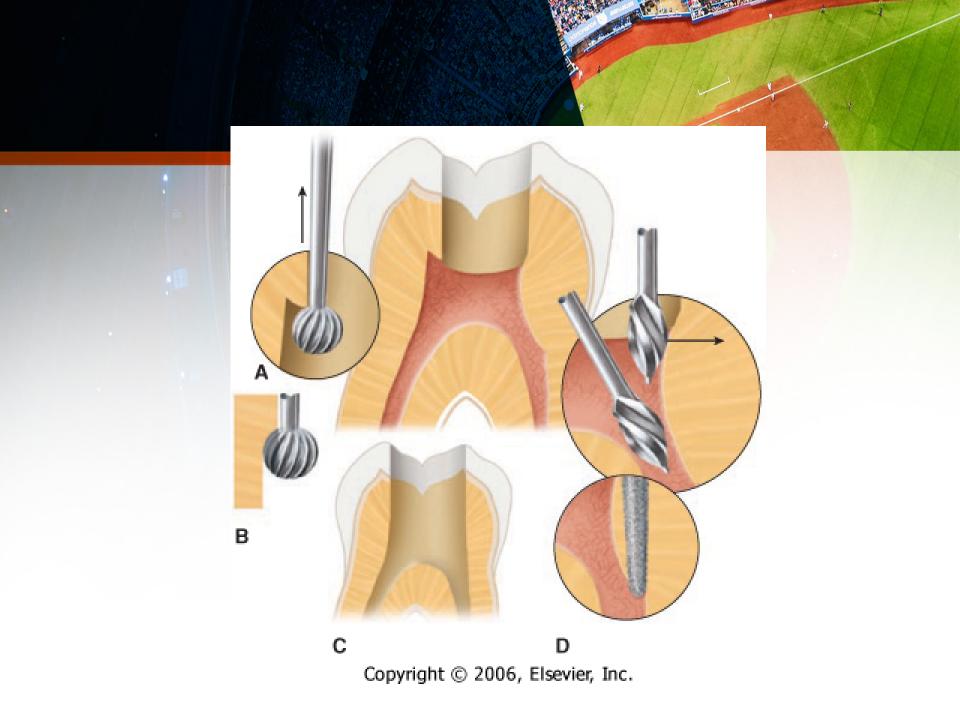
Mandibular Molars – Think Symmetry





Access Preparation

- MEASURE!!!
- Initial Access
 - In the middle!!
 - Distally do not need to extend distal to line between distal cusps
 - Between mesial cusps
 - Toward M/B
 - Should <u>not</u> encroach on mesial marginal ridge
- Depth- Average 6mm
- Locate pulp horns with Endo explorer



Review of cleaning and shaping

Working Length Determination

- -You should already have determined EWL preoperatively (length of tooth less 1 mm)
- -Use glide path files (10,15) and reciprocal reaming to EWL
- -You may need to pre flare with Gates Gliddens in order to negotiate to EWL

Working Length Determination

- Coronal flaring and lingual shoulder/cervical bulge removal with Gates-Glidden drills (attain SLA)
- Determine FFB
- Verify WL with radiograph of FFB (at least #15)
- Adjust and re-verify as needed (more than 1mm)
- Record results

WaveOne Gold Canal Preparation

- Select appropriate size WaveOne Gold file
 - Small- FFB is #10 with difficulty or smaller (#20.07 taper)
 - Primary- FFB is #10 easily or #15 (#25 .07 taper)
 - Medium- FFB is #20 or #25 (#35 .06 taper)
 - Large- FFB is #30 or larger (#45 .05 taper)

Using the ProMark electric endo motor, advance down the canal in 1-2 mm increments with a pecking motion and light apical pressure (set stopper at WL)

After advancing 1-2 mm, wipe file with alcohol gauze, inspect it for abnormalities, irrigate canal (water in lab, sodium hypochlorite in clinic), and **confirm patency with #10 file**, then irrigate again

Continue until WaveOne Gold file reaches WL

Final Apical Preparation (creation of the apical matrix)

Goal- Evaluate apical prep after WaveOne Gold and create an .04 tapered canal prep in the apical 1-3 mm <u>as needed</u> (based on 3 sizes larger than FFB or apical gauging)

How? Example- The *FFB* is #15. The primary WaveOne Gold was used and taken to WL. This means the canal is now at a size 25 (at least) .07 taper at WL. Using the "3 sizes larger than *FFB*" rule (#20, 25, 30) and a reciprocal reaming motion, now take:

#30.04 hand file to WL (irrigate, patency with #10)

Evaluate apical prep with *Apical Gauging* to decide if additional apical enlargement with the next .04 hand file is needed (35.04 this example)

Repeat as needed till gauging confirms apical size and taper (see page 50-51)

Apical Gauging!!!!

Apical gauging is used to:

 verify the apical matrix has a taper that will provide the necessary linear resistance form for obturation

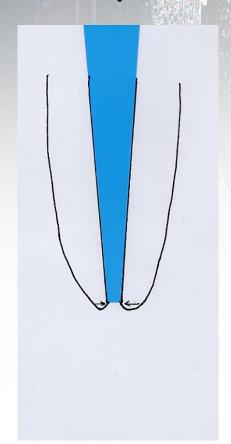
AND, MORE IMPORTANTLY,

 determine the "precise" size of your apical preparation, size/taper of master gutta percha cone and to help prevent "apical slippage" or overfill

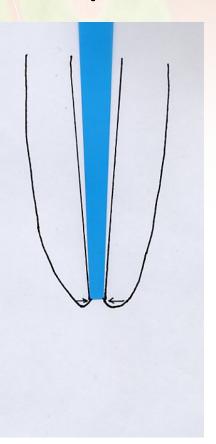
Use <u>.02 taper files</u> as a "Feeler Gauge" to measure the diameter of the apical matrix in the apical 3-4mm

.02 taper files should (theoretically) only bind at the tip of the file in a larger tapered preparation thus measuring the diameter of the prep at the level that the .02 file contacts the walls (binds)

.04 taper file



.02 taper file



Example: **FFB** #20. Medium WaveOne selected, C & S to size #35 .06 to WL of 20mm (3 sizes larger than **FFB**):

- place #35/.02 to WL with moderate apical pressure
- If the .02 taper file meets resistance at WL, that tells you the apical size is at least #35, but may be bigger (don't assume it is not bigger)
- Place the #40 .02 file in the canal with moderate apical pressure. If it stops 0.5 mm or so from WL, you have now verified #35 as your apical size

But, what if the #40 .02 file goes to 20mm?

- #45 .02 to 19.5 mm? #40 is your apical size
- #50 .02 to 20 mm? Go #55 .02, etc., until you get to the size that stops at 19.5 mm

Most important

What if #35 .02 file goes to 21mm?

- Your apical size is larger than #35 and if you obturate with a #35 gp point you will most likely over extend the fill. So...
 - apically gauge with successively larger .02 files until you reach the size that cannot be taken beyond 20mm (remember to always try the next larger size to verify it can not get to 20 mm)

If the final apical size is different than what you thought (ie #40.02 instead of #35.02),

you now need to create an .04 taper apical matrix by taking the #40.04 file to 20 mm

Ok, the final apical size has been "precisely" verified and can be recorded in the worksheet table and axiUm.

Now we can verify an .06 taper has been achieved by: (Apical size has been apically gauged as #35.02)

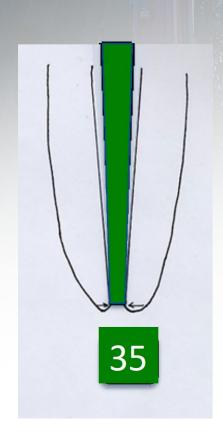
#40.02 file ~ 19.5mm

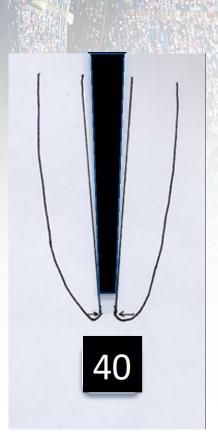
#45.02 file ~ 19.0mm

#50.02 file ~ 18.5 mm

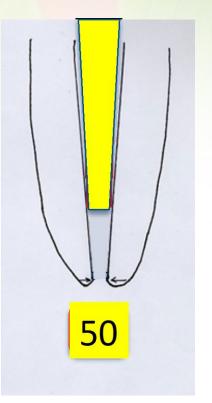
#55.02 file ~ 18.0mm

Apical Gauging









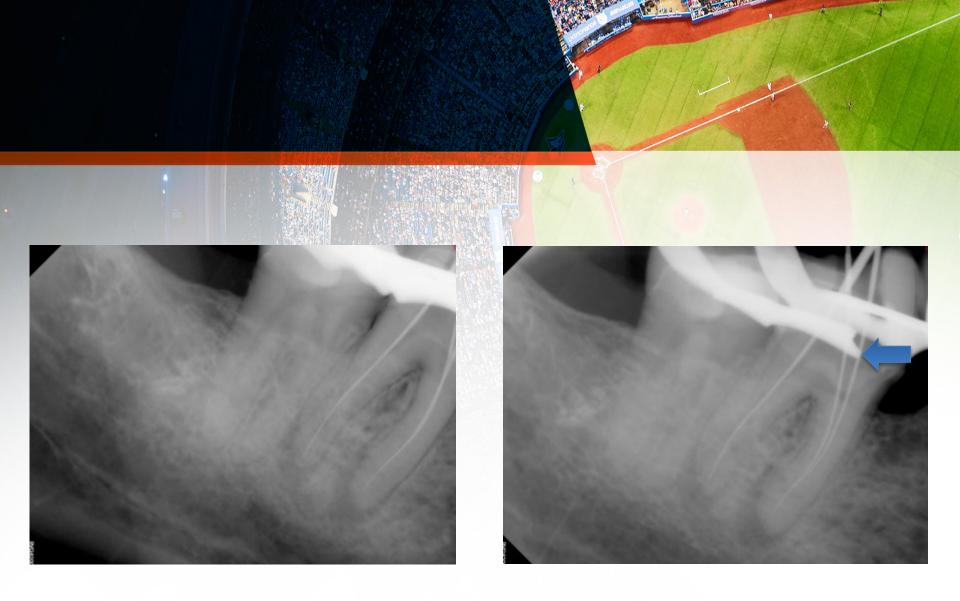
MOLAR HINTS

- Working length radiograph
 - Files in all canals if possible- if not, 1 root at a time (to determine merging or separate)
 - Off angle (use holder)
 - Master cone radiograph same
- Plugger fitting- both System B and Buchanan pluggers
 - Preliminary fit- in each canal and write down length
 - Final fit when ready to downpack each canal
- Obturation- down pack all canals (one at a time), then backfill all (one at a time)

MOLAR HINTS

Merging canals

- Determine merging as early as possible (working length film)
- Determine which canal is most easily negotiate to WL
- Measure the other canal to the merger point- this becomes the WL for the merging canal. C and S and fit master cone to that point.
- When downpacking make sure you have the master cones in both canals so you don't get backwash of gp and sealer.



Same Lingual Opposite Buccal

Instructor Checkpoints

- Half way access check
- Access
- Working length radiograph (angled, use holder)
- Apical gauging, plugger fit, master cone fit
- Master cone radiograph (angled, use holder)
- Obturation check radiograph (angled, use holder)
- Final radiographs (B-L, M-D), rubber dam off
- Instructors:
 - Swipe "endo working lengths" form
 - Critique and score (p 29, p 82)

Reminders

GATES - GLIDDEN DRILLS

MEASURE TWICE, CUT ONCE!!!

IRRIGATE, IRRIGATE, IRRIGATE!!!

PATENCY, PATENCY!!!

START NEW RADIOGRAPH TEMPLATE

Next week

Theme: Favorite Hat Day

Continue mandibular molar- access, C& S, obturate

Catch up

Mount maxillary molar

And remember...

"A day without endo is a day without sunshine"