

Endodontics Department

To: 1st Year Endo Postgrads & CE Participants
From: Dr. Rocha (Romero)
Re: Postgraduate Technique Course ENDO 600 - Summer Session 2009
Clinic Seminar Charles G. Maurice Room - seminars;
Endodontic Microscopy Center lab

All teeth to have preoperative radiographs from two different angles before starting

Project I

Access cavities made in extracted teeth in hand:

- 1 - max. incisor
- 1 - max. canine
- 1 - max. premolar
- 2 - max. molars
- 1 - mand. anterior
- 1 - mand. premolar
- 2 - mand. molars

Project II

Complete instrumentation of extracted teeth in hand using teeth from Project I:

- 1 - max. canine
- 1 - mand. anterior
- 1 - max. molar
- 1 - mand. Molar
- 2 - acrylic blocks; one instrumented with your own technique, one with flare technique as taught by Dr. Wenckus

Project III

Complete instrumentation and obturation of extracted teeth, in hand, using teeth from project one

- 1 max. molar
- 1 mand. molar

Project IV

Using a molar and an acrylic block in your hand, a hand Ni-Ti technique of cleansing and shaping will be done (Dr. Weeks session)

Project V

Using two molars (one mand./one max.) and an max. anterior tooth, all mounted in plaster blocks, an automated technique of cleansing and shaping will be done with NiTi files (Dr. Rogers sessions)

USE EYE PROTECTION, GLOVES AND MASKS WHEN CUTTING OR PREPARING TEETH !!!

SPECIAL PROJECTS

7/1/09 9 AM - Access Cavity Preparation - Dr. Johnson

1. Cohen & Burns, Pathways of the Pulp 9th ed. (2006), Chap. 7; pp. 148-232.
2. Krasner P, Rankow HJ. Anatomy of the Pulp-Chamber Floor. J Endod 30(1): 5-17, 2004.

7/6/09 10:30 AM - Instrumentation/Canal Preparation - Dr. Wenckus

1. Schilder H, Cleaning and Shaping the Root Canal, Dent Clin North Amer; 18:269-296, April 1974
2. Weine FS, Kelly RF, and Lio PJ, The Effect of Preparation Procedures on Original Canal Shape and On Apical Foramen Shape, J Endod 1: 255-62, August 1975
3. Roane JB, Sabala CL, and Duncanson, Jr MG, The "Balanced Force" Concept for Instrumentation of Curved Canals, J Endod 11:203-211, May 1985

4.

5.

7/13/09 - Dr. Bentkover - Introduction to Non-Surgical Uses of the Operating Microscope

Have ready before class:

- 1 maxillary anterior and 1 maxillary molar, not mounted

7/15/09 - Dr. Goldberg- Perforation repair

Have ready before class:

- 2 accessed molars with perforations in the furcas (bur perforations); place utility wax over perforations in furca area to simulate furcal bone loss; mount in acrylic (use rectangular wax mold cup for mold).

7/16/09 - Dr. Weeks - CaOH fill of an open apex

Have ready before class:

- 1 open apex tooth mounted in plaster with a cotton pellet at the apex (use paper cup as mold).

07/10/09: Removal of Metal Fragments from Root Canal Spaces Dr. Woolman (read all articles!) Then, each PG reviews and critiques articles assigned- no more than 3-4 minutes per article):

Glick, D. and Frank, A.: Removal of silver points and fractured posts by ultrasonics, J. Pros. Dent. 55: 212215, 1986

Dr. Satish Alapati

Ruddle, Clifford J: Nonsurgical Endodontic Pretreatment: Post Removal Simplified. Dentistry Today 17:48-53, 1998

Dr. Robert Lee

Hulsman, M. and Schinkel, I.: Influence of Several Factors on the Success or Failure of Removal of Fractured Instruments from the Root Canal. Endod Dent Tramadol 15: 252-258, 1999

Dr. Yolanda Madison

Feldman, G. et al.: Retrieving broken endodontic instruments. JADA 88: 588-591, 1974

Dr. Steven Raphael

Ruddle, C.: Removal of Broken Instruments. Endodontic Practice 6: 13-19, 2003

Suter, Beat: A New Method for Retrieving Silver Points and Separated Instruments from Root Canals. JOE 24: 446-448, 1998

Dr. Robert Schmidt

Dominici, John T., Clark, Stephen, Scheetz, James, and Eleazer, Paul D.: Analysis of Heat Generation Using Ultrasonic Vibration for Post Removal. JOE 31: pp. 301-303, 2005

Souter, Nigel J., Messer, Harold H.: Complications Associated with Fractured File Removal Using Ultrasonic Technique. JOE 31: 450-452, 2005

Dr. Qian Xie

7/17/09 - Dr. Woolman - Removal of metallic objects from canals

Have ready before class:

- 2 molars, minimally instrumented and filled with silver points, broken instruments, and broken posts (try to break instruments, posts so the fragment extends into the coronal 1/3 of canal. You can cement (C&B cement) a paper clip into canal(s) to simulate a broken post)
- 2 plastic canal blocks, instrumented and filled with a silver point and a broken instrument

TO: 1st Year Postgrads

FROM: Dr. Rocha (Romero)

RE: Endo Postgrad Technique Course Lectures - ENDO 600

Lectures/seminars will (usually) take place at either 9:00 a.m. or 1:00 p.m. in the the Charles G. Maurice Room. Please complete the following reading assignments **prior** to each session.

7/8/09 – Obturation - Dr. Weeks

1. Schilder, H.: Filling root canals in three dimensions. Dent. Clin. N. Amer.: 723-744, Nov. 1967.
2. Cohen, S. and Burns, R.C. Pathways of the Pulp, 6th ed.,1994, chapter 9 (219271), chapter 14 (391-396)

7/8/09 9:00 am – Hand NiTi Instrumentation - Dr. Weeks

1. Morgan, L., Montgomery, S., "An Evaluation of the Crown-Down Pressureless Technique," JOE 10: 491 -98, 1984
2. Wildey, W., Senia, S., Montgomery, S., "Another Look at Root Canal Instrumentation," OOO 74: 499-507,1992
3. Himel, V., "The University of Tennessee, College of Dentistry: Philosophy and Technique of Cleaning and Shaping Root Canal Systems," personal communication, 1996
4. Weeks, S., "Crown-Down/Step-Back Technique," Woodlawn Press, 1996

7/10/09 9 AM – Automated NiTi Instrumentation - Dr. Rogers

1. Roland DD, Andelin WE, Browning DF, Hsu GR, Torabinejad M.
The effect of preflaring on the rates of separation of 0.04 taper nickel titanium instruments.
J Endod 2002;28:543–5.
2. Usman N, Baumgartner JC, Marshall JG.
Influence of instrument size on root canal debridement.
J Endod 2004;30:110–2.
3. Peters OA.
Current challenges and concepts in the preparation of root canal systems: a review.
J Endod 2004;30:559–67.
4. Baugh D, Wallace J.
The role of apical instrumentation in root canal treatment: a review of the literature.
J Endod 2005;31:333–40.
5. Davis RD, Marshall JG, Baumgartner JC.
Effect of early coronal flaring on working length change in curved canals using rotary nickel-titanium versus stainless steel instruments.
J Endod 2002;28:438–42.
6. Senia ES, Wildey WL.

The LightSpeed root canal instrumentation system.

Endod Topics 2005;10:148–50.

7. Lloyd A.

Root canal instrumentation with Profile instruments.

Endod Topics 2005;10:151-54.

8. Buchanan LS.

ProSystem GT: Design, technique, and advantages.

Endod Topics 2005;10:168–75.

9. Gambarini G.

The K3 rotary nickel titanium instrument system.

Endod Topics 2005;10:179–82.

10. Ruddle CJ.

The ProTaper technique.

Endod Topics 2005;10:187–90.

11. Vertucci FJ.

Root canal morphology and its relationship to endodontic procedures

Endodontic Topics 2005, 10, 3–29

12. Bergmans L, Van Cleynenbreegel J, Wevers M, & Lambrechts P,

Mechanical root canal preparation with NiTi rotary instruments: Rationale, performance and safety. Status Report for the American Journal of Dentistry

Am J Dent 2001;14:324-333

**7/13/09 9:00 AM - Introduction to Non-Surgical Uses of the Operating Microscope
- Dr. Bentkover**

1. Carr, G.: "Advanced Techniques and Visual Enhancement for Endodontic Surgery"

1. Carr, G.: "Microscopes in Endodontics", CDA Journal, 55-61 November 1992,

3. Mounce, R., "Surgical Operating Microscopes in Endodontics: The Quantum Leap,"
Dentistry Today 12(8): October 1993

4. Cambruzzi, J., Marshall, J., Pappin, J., "Methylene Blue Dye: An Aid to Endodontic Surgery," JOE 11 (7): 311-314, July 1985

5. Carr, G., "Common Errors in Periradicular Surgery," The Endodontic Report 8 (1),12-18

6. Ruddle, C., "Endodontic Perforation Repair: Using the Surgical Operating Microscope," Dentistry Today 13(5): May 1994

7. Weller, N., Niemczyk, S., and Kim, S., "Incidence and Position of the Canal Isthmus. Part 1. Mesiobuccal Root of the Maxillary First Molar," JOE 21 (7): 380-383, July 1995

8. Layton, C., et. al., "Evaluation of Cracks Associated with Ultrasonic Root-End Preparation," JOE 22 (4) 157-160: April 1996

8. Pecora, G., and Andreana, S., OOO 75 (6) 751-758: June 1993

9. Gilheany, P., et. al., "Apical Dentin Permeability and Microleakage Associated with Root End Resection and Retrograde Filling," JOE 20 (1) 22-26: January 1994

10. Wuchenich, G., et. al., "A Comparison between Two Root End Preparation Techniques in Human Cadavers," JOE 20 (6) 279-282: June 1994
11. Antrim, F., and Bakland, L., "Effect of Retrograde Cavity Preparations on Root Apexes," Endod Dent Traumatol 12 100-103
12. Gorman, M., Steiman, H.R., and Gartner, A., "Scanning Electron Microscopic Evaluation of Root End Preparations," JOE 21 (3) 113-117: March 1995
13. Seldon, H., "The Role of a Dental Operating Microscope in Improved Nonsurgical Treatment of "Calcified" Canals,"

7/14/09 9:30 am – Dr. Wenckus – Apexification/Vital Pulp Therapy

1. Bogen, G., Kim, J., & Baklund, L: Direct Pulp Capping with Mineral Trioxide Aggregate. JADA Vol. 139 March 2008 pp. 305-315.

7/15/09 9 AM - Perforations - Dr. Goldberg

1. Benenati, F.W., Roane, J.B., Simon, J.H., "Recall Evaluation of Iatrogenic Root Perforations Repaired with Amalgam and Gutta-Percha," J Endod 1986; 12:161-6.
2. Kvinnsland, I., Oswald, R. J., "A Clinical and Roentgenological Study of 55 Cases of Root Perforation," Int Endodo J 1989; 22:75-84.
3. Lemon, R., "Non-Surgical Repair of Perforation Defects," Dent Clin North Amer 1992; 36:2 439-57.
4. Lee, S.J., Monsef, M., Torabinejad, M., "Sealing Ability of a Mineral Trioxide Aggregate for Repair of Lateral Root Perforations," J Endod 1993; 19:541-4.
5. Dragoo, M.R., "Resin-Ionomer and Hybrid-Ionomer Cements; Part I Comparison of Three Materials for the Treatment of Subgingival Root Lesions," Int J Periodontal Rest Dent 1996; 16:595-601.
6. Seltzer, S., Sinai, I. and August, D.: "Periodontal effects of root perforations before and during endodontic procedures", J. Dent. Res. 49(2):332-339, April 1970
7. Dragoo, M.R., "Resin-Ionomer and Hybrid-Ionomer Cements; Part II Human Clinical and Histologic Wound Healing Responses in Specific Periodontal Lesions," Int J Periodontal Rest Dent 1997; 17:75-87.
8. Kaufman, A.Y., Fuss, Z., Keila, S., Waxenberg, S., "Reliability of Different Electronic Apex Locators to Detect Root Perforations *in vitro*," Int Endod J 1997; 30(6)403-7.
9. Main, C., Mirzayan, N., Shabahang, S., Torabinejad, M., "Repair of Root Perforations Using Mineral Trioxide Aggregate: A Long-Term Study," J Endod 2004; 30(2):80-3.
10. Clauder T, Shin SJ., "Repair of Perforations with MTA: clinical applications and mechanisms of action." Endodontic Topics; Vol 15, 2006.

7/16/09 1 PM - Calcium Hydroxide - Dr. Weeks

1. Webber, R., Schwiebert, K. and Cathey, G.: "A technique for placement of calcium hydroxide in the root canal system", JADA 103: 417, 1981

2. Cvek, M.: "Prognosis of luxated non-vital maxillary incisors treated with calcium hydroxide and filled with gutta-percha. A retrospective clinical study", Endod. Dent. Traumatol. 8: 45, 1992
3. Sigurdsson, A., Stancill, R. and Madison, S.: "Intracanal placement of Ca(OH)₂: A comparison of techniques", J. Endo 18: 367, 1992
4. Schumacher, J. and Rutledge, R.: "An alternative to apexification. J. Endo 19: 529, 1993
6. Oguntebi, B., "Dentine Tubule Infection and Endodontic Therapy Implications," Int. Endo. J. 27: 218, 1994

7/17/09 9 AM – Flexible Pain Strategies – Dr. Rogers

Cohen, H.P., Cha, B.Y. & Spångberg, L.S.W.:

Endodontic anesthesia in mandibular molars: A clinical study.

J. Endod. 19(7): 370-373, July 1983

Walton R.E

Distribution of solutions with the periodontal ligament injection: Clinical, anatomical, and Histological Evidence.

J. Endod 12(10): 492-500, Oct. 1986

Replogle, K. et al

Anesthetic efficacy of the intraosseous injection of 2% Lidocaine (1:100,000 Epinephrine) and 3% Mepivacaine in mandibular first molars.

OOO 83(1): 30-37, Jan. 1997

VanGheluwe, J. & Walton, R

Intrapulpal injection. Factors related to effectiveness.

OOO 83(1): 38-40, Jan. 1997

Bou Dagher, F., Yared, G.M. & Machtou, P

An evaluation of 2% lidocaine with different concentrations of epinephrine for inferior alveolar nerve block.

J. Endod. 23(3): 178-180, March 1997

Reisman, D. et al.

Anesthetic efficacy of the supplemental intraosseous injection of 3% Mepivacaine in irreversible pulpitis.

OOO 84(6): 676-682, Dec. 1997

Malamed, S.F., Gagnon, S. & Leblanc, D

Efficacy of articaine: A new amide local anesthetic.

JADA 131: 635-642, May 2000

Malamed, S.F., Gagnon, S. & Leblanc, D

Articaine hydrochloride: A study of the safety of a new amide local anesthetic.

JADA 132: 177-185, Feb. 2001

Hargreaves. KM and Keiser, K

Local anesthetic failure in endodontics: mechanisms and management

Endo topics 2002, 1, 26-39

J. G. Meechan

Supplementary routes to local anaesthesia

International Endod journal, 2002 885-896,

Ianiro, SI, Jeansonne, BG, McNeal, SF, and Eleazer, PD

The Effect of Preoperative Acetaminophen or a Combination of Acetaminophen and Ibuprofen on the Success of Inferior Alveolar Nerve Block for Teeth with Irreversible Pulpitis

J Endod 2007;33:11-14

Corbett et al.

Articaine infiltration anesthesia of mandibular first molars.

J Endod 2008;34:514-18

Jung et al.

An Evaluation of Buccal Infiltrations and Inferior Alveolar Nerve Blocks in Pulpal Anesthesia for Mandibular First Molars.

J endod 2008;34:11-13

7/20/09 1 PM – Obturation Techniques – Dr. Fayad

1. Schilder, H., "Filling root canals in three dimensions", Dent. Clin. N. America: 723, Nov. 1967
2. Schilder, H., "Physical properties of gutta-percha when subjected to heat and vertical condensation," Oral Surg. 35: 872, Dec. 1973
3. Schilder, H., "The Thermomechanical properties of gutta-percha," Oral Surg. 37: 946, June 1974
4. Schilder, H., Goodman, A., & Aldrich, W., "The thermomechanical properties of gutta-percha: III. Determination of phase transition temperatures for gutta-percha," Oral Surg. 38(1): 109, July 1974
5. Yee, F.S., et al., "Three dimensional obturation of the root canal canal using injection - molded thermoplasticized dental gutta-percha," J. Endodod. 3(5): 168, May 1977
6. Johnson, W.B., "A New gutta-percha technique," J. Endod. 4(6): 184, June 1978
7. Goodman, A., Schilder, H., & Aldrich, W., "The thermomechanical properties of gutta-percha, Part IV. A thermal profile of the warm gutta-percha packing procedure," Oral Surg. 51(5): 544, May 1981
8. Schilder, H., Goodman, A.G., & Aldrich, W., "The thermomechanical properties of gutta-percha. Part V. Volume changes in bulk gutta-percha as a function of temperature and its relationship to molecular phase transformation," Oral Surg. 59(3): 285, Mar. 1985
9. Marciano, J., & Michalesco, P. M., "Dental gutta-percha: Chemical composition, x-ray identification, enthalpic studies, and clinical applications," J. Endod. 15(4): 149, Apr. 1989
10. Lares, C., & El Deeb, M.E., "The sealing ability of the Thermafil Obturation Technique," J. Endod. 16(10): 475, Oct. 1990
11. Kouvas, V. et al., "Influence of smear layer on depth of penetration of three endodontic sealers: an SEM study," Endod. Dent. Traumatol. 14(4): 191, Aug. 1998
12. Lee, F.S., Van Cura, J.E. & BeGole, E., "A comparison of root surface temperatures using different obturation heat sources," J. Endod. 24(9): 617, Sept. 1998

13. Lertchiraken, V. et al., "Load and strain during lateral condensation and vertical root fracture," J. Endod. 25(2): 99, Feb. 1999
14. DuLac, K.A., et al., "Comparison of the obturation of lateral canals by six techniques," J. Endod. 25(5): 376, May 1999
15. Floren, J.W., et al., "Changes in root surface temperatures with in vitro use of the System B HeatSource," J. Endod. 25(9): 593, Sept. 1999
16. Johnson, B.T., & Bond, M.S., "Leakage associated with single or multiple increment backfill with Obtura II gutta-percha system," J. Endod. 25(9): 613, Sept. 1999
17. Goldberg, F., Artaza, L., & De Silvio, A., "Effectiveness of Different Obturation Techniques in the Filling of Simulated Lateral Canals," J. Endod. 27(5): 362-67 May 2001
18. "An Evaluation of Microbial Leakage in Roots Filled with a Thermoplastic Synthetic Polymer-Based Root Canal Filling Material (Resilon); J Endod. 30: page 342, May 2004

7/10/09 & 7/17/09: 1 PM- Removal of Metal Fragments from Root Canal Spaces Dr. Woolman

Bring at least two extracted teeth and two acrylic blocks, instrumented and filled with cemented silver points present (cement a paper clip into a canal to simulate a post if you cannot find teeth with posts and if you have no posts to cement for this exercise; please break off paper clips higher up coronally).

Removal of Foreign Bodies from Root Canal Spaces

Reading List:

Ruddle, Clifford J.: Nonsurgical Endodontic Retreatment: Post Removal Simplified. Dentistry Today 17:48-53, 1998

Hulsman, M. and Schinkel, I.: Influence of Several Factors on the Success or Failure of Removal of Fractured Instruments from the Root Canal. Endod Dent Traumatol 15: 252-258, 1999

Ruddle, Clifford J.: Removal of Broken Instruments. Endodontic Practice 6: 13-19, 2003

Dominici, John T., Clark, Stephen, Scheetz, James, and Eleazer, Paul D.: Analysis of Heat Generation Using Ultrasonic Vibration for Post Removal. JOE 31:301-303, 2005

Huttula, Andrew S., Tordik, Patricia A., Imamura, Glen, Eichmiller, Fredrick C., and McClanahan, Scott B.: The Effect of Ultrasonic Post Instrumentation on Root Surface Temperature. JOE 32: 1085-1087, 2006

Hashem, Ahmed Abdel Rahman: Ultrasonic Vibration: Temperature Rise on External Root Surface During Broken Instrument Removal. JOE 33: 1070-1073, 2007

Altshul, Joel H., Marshall, Gordon, Morgan, Leslie A., and Baumgartner, J. Craig: Comparison of Dental Crack Incidence and of Post Removal Time Resulting from Post Removal by Ultrasonic or Mechanical Force. JOE 23: 683-686, 1997

Souter, Nigel J. and Messer, Harold H.: Complications Associated with Fractured File Removal Using an Ultrasonic Technic. JOE 31: 450-452, 2005