

Furcations, Projections, Concavities Oh My!

Presented and prepared by: Beth Parkes RDH, BSc

Learning Objectives:

- Review and gain a deeper understanding of root morphology and the impact that abnormalities have on debridement.
 - Review exploratory tools and techniques to increase calculus detection.
 - Explore and broaden your armamentarium to improve clinical outcomes.
 - Learn how to use the AAP classifications to help create a strategy to treat your difficult Periodontal cases through optimal instrument selection.
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Trends in Instrumentation:

- Increased use of ultrasonics
- Improved ergonomics
- Use of magnification
- Integration of lasers
- Miniaturization of powered and manual instruments
- Endoscopy use and research
- Improved grade of metal
- Sharpen-free technology
- Diamond coated instruments
- Subgingival Air polishing
- Use of various adjunctive therapies.

Global issues:

- Lack of early diagnosis
- Ineffective subgingival debridement
- Misuse of ultrasonics
- Inadequate time
- Poor equipment
- Dull or worn instruments

Assessment:

- Probing depths
- Bleeding on probing
- Gingival recession
- Clinical attachment levels
- Furcations, concavities
- Anatomical abnormalities
- Mobility
- Calculus attachment

Exploratory Basics:

- Light, relaxed grip
- Feather touch
- Systematize
- Avoid coming out and reinserting to prevent tissue trauma
- Place the toe third against tooth and use vertical and oblique walking strokes
- Re-evaluate and re-explore often to avoid leaving residual calc and to reduce over treatment.

Three Factors effecting accuracy of probing:

1. Probe used
2. The operator
3. The environment

Al Shayeb, Kwthar & Turner, Wendy & Gillam, David. (2014). Periodontal Probing: A Review. Primary Dental Journal. 3. 10.1308/205016814812736619

Tooth anatomy review references:

- Dental Care.ca: An Overview of Dental Anatomy
Course number 500
- <https://www.dentalcare.ca/en-ca/ce-courses/ce500>

Bone Box App

- <https://apps.apple.com/ca/app/bonebox-dental-lite/id898263235>



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- <https://dental-lite.en.aptoide.com/app>

Why aren't teeth shaped like Starbucks cups?

- To protect the tooth from forces that could rotate it in its alveolus.
- To provide more root surface area.
- To provide direction for the periodontal fiber attachment.

Instrument Selection considerations

Flexible	Moderately flexible	Rigid
Examples: Explorer & Graceys	Examples: Universal Curettes	Examples: Sickles, Rigid Curettes, Hoes and Files
<ul style="list-style-type: none">• Ideal for detection of calculus• Removal of light calculus• Provides best tactile sensitivity	<ul style="list-style-type: none">• Removal of light or moderate calculus• Still provides decent tactile sensitivity	<ul style="list-style-type: none">• Limited tactile sensitivity• Removal of heavy and tenacious calculus• Also available in extra rigid

Sumi J, Nguyen M. Hand-activated instrumentation. In: Darby and Walsh's Dental Hygiene: Theory and Practice. 5th ed. Philadelphia: Elsevier; 2020:414–455.

Factors affecting Life of an instrument:

- Practice demographic
- Type of deposit
- Ratio of ultrasonic to hand instrumentation
- Frequency of sharpening
- Sharpening technique
- Proper use of instrument

Furcations:

Glickman Classification:

Grade 1:

There is a fluting into the area of the furcation, but the interradicular bone is intact. With grade 1 there will be no radiographic evidence of furcation involvement or bone loss.

Grade 2:

The interradicular bone is destroyed on one or more aspects of the furcation, but a portion of alveolar bone and periodontal ligament remains intact.

Grade 3:

The furcation is occluded by gingiva, but the interradicular bone has been destroyed so that a probe can be passed through from one surface to the other.

Grade 4

The periodontium is destroyed to such a degree that the furcation is open and exposed.

Furcator:

- Fine, angled micro-size excavator.
- Designed for debriding the roof and inner surfaces of furcations, as well as concavities and grooves.
- Petite clinical design ideal to access and treat Class I and II furcations and to prevent further involvement.
- One of the few instruments that can fit along the fornix of the furcation.



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Diamond-Coated Instruments:

- Have no cutting edges.
- Coated with very fine diamond grit.
- Working-end design is similar to Nabers furcation probe.
- Used like an emery board to remove small remnants of calculus.

O'Hehir Curettes:

- The entire circumference of the working-end is a cutting edge.
- Can be used with a push or pull stroke in any direction – vertical, horizontal, or oblique.
- The working-end curves into the tooth for easy adaptation in furcations, developmental grooves, and line angles.
- These curettes have extended lower shanks for easy access into deep periodontal pockets.
- Considered area- specific curette designed to remove light residual calculus deposits and bacterial contaminants from the entire root surface.

Queen of Hearts:

- Has long fine cutting edges for finishing details.
- The blade has been balanced and rotated so the toe of the instrument can be inserted into a deep narrow pocket, minimizing tissue trauma.
- Longer cutting edges 6 mm.
- Used like a probe.

Dual Gracey Syntette

- Combines your traditional 13/14 and 11/12 Gracey without the need to change instruments OR switch ends.
- Save time searching and flipping.
- Save money.

Anterior Gracey Syntette

- Combines your traditional 1/2 and 7/8 Gracey without the need to change instruments OR switch ends.

Dental Anomalies

Enamel Pearl:

- Typically appears as a round, single, solid formation on the tooth surface.
- May vary in size from microscopic to a few millimeters.

Radiographically:

- Appears as a smooth, radiopaque structure on the root of multirouted teeth.

Composition:

- Comprised of a combination of pure enamel and sometimes dentin.
- The dentin core may be found within the nodular entity, and it is not uncommon to also detect a pulp horn.
- Pulp vitality test is required.

The Problem:

- Because the pearl often results in a deeper pocket, it can be mistaken as calculus.
- The tissues adjacent to the enamel pearl are believed to have a weaker attachment to the PDL and therefore have higher risk of periodontal involvement and inflammation.
- *Anahita P. Periodontal Management of a Case with Enamel Pearl. J Dental Sci 2018*



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Cervical Enamel projection:

- “Cervical enamel projections (CEPs) are the focal apical extension of the coronal enamel beyond the normally smooth cervical margin on to the root of the tooth”.
- “They are flat ectopic deposits of enamel that are triangular in shape and tapering in form, extending apically into the furcation area.”

Fun Facts:

- The enamel projection may extend into long narrow projections and sometimes connect to enamel Pearls, to the root, or crown portion.
- Periodontal attachment loss is more likely when a projection is present because periodontal fibers do not form the same type of attachment to enamel as it does to cementum.
- The mandibular second molars showed the highest incidence of enamel projections (51.0%), followed by the maxillary second molars (45.6%).
- The projections can be removed surgically to expose dentin and facilitate reattachment of periodontal fibers.

References:

- Attar NB, Phadnaik MB. *Bilateral cervicoenamel projection and its management: A case report with lingual involvement. J Indian Soc Periodontol.* 2009 Sep;13(3):168-71. doi: 10.4103/0972-124X.60233. PMID: 20379418; PMCID: PMC2848791.
- Swan RH, Hurt WC. *Cervical enamel projections as an etiologic factor in furcation involvement. J Am Dent Assoc.* 1976 Aug;93(2):342-5. doi: 10.14219/jada.archive.1976.0527. PMID: 1065692.

Palatogingival grooves:

Fun Facts:

- Found on maxillary lateral incisors, more often than central incisors.
- known to be a predisposing factor to localized periodontal disease.
- Originates in the cingulum and extends mesially or distally in an apical direction along the root surface.
- Can be a major plaque trap that is not cleansable and has limited access.
- Approximately 8% of patients will have them.
- These areas are difficult to detect as they are covered by gingiva.
- There is often a deep pocket associated with these which indicates that these areas are often missed.

References:

- Sharma S, Deepak P, Vivek S, Ranjan Dutta S. *Palatogingival Groove: Recognizing and Managing the Hidden Tract in a Maxillary Incisor: A Case Report. J Int Oral Health.* 2015 Jun;7(6):110-4. PMID: 26124612; PMCID: PMC4479763.

Basic ergonomics report card:

- | | | |
|-------------------------|--------------------------------------|------------------------------------|
| • Grasp | • Instrument selection and condition | • Clinician and client positioning |
| • Fulcrum | | |
| • Adaptation and stroke | | |

Grasp:

- Thumb and index finger provide the rotation of the instrument to help roll and adapt.
- Middle finger provides stability and lateral pressure.
- Ring finger provides the fulcrum.
- The pinky is just cute 😊, keep it relaxed and not flexed.



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Supportive studies for handles selection:

- Suedbeck JR, Ludwig EA. Pinch force generation during scaling by dental professionals: a systematic review. *Int J Dent Hyg. December 15, 2022. Epub ahead of print*
- Blue Christine M. 2017. *Darby's Comprehensive Review of Dental Hygiene. 8E édition ed. St Louis Missouri: Elsevier.*

Dull or worn instruments:

- Will not effectively detect calculus.
- Encourages excessive force all around.
- Create constriction and restriction of wrist and fingers.
- Increase risk of slipping, lacerating tissue.
- Increase risk for burnished calculus.
- Requires more time in chair.

Imagine if they simply presented with less....

Clinical Trial:

Anti-Gingivitis and Anti-Plaque Efficacy of an Oral Hygiene Routine including Oral-B® iO Oscillating-Rotating Electric Toothbrush, Stannous Fluoride Dentifrice, CPC Rinse and Floss: Results from a 12-week Trial

- Adam R, Grender J, Timm H, Qaqish J, Goyal CR. *Anti-gingivitis and Anti-plaque Efficacy of an Oral Hygiene System: Results From a 12-Week Randomized Controlled Trial. Compend Contin Educ Dent 2021; 42 (9): E1-4.*

Findings:

- A recent study was published in the International Dental Journal which was a 12-week trial and included the new Oral-B iO Oscillating-Rotating with micro-vibrations power brush, Stannous Fluoride, CPC Rinse and Floss.
- The group (with gingivitis) that were on a manual brush with Sodium Fluoride improved by 20%.
- The group with the iO power brush and Stannous Fluoride improved by 80% and,
- The group who incorporated the new Oral-B iO Oscillating-Rotating with micro-vibrations power brush, Stannous Fluoride, CPC Rinse and Floss improved by 100%

Powered versus manual toothbrushing for oral health (Cochrane study, [Munirah Yaacob 17 june, 2014](#))

Objective:

- To compare manual and powered toothbrushes in everyday use, by people of any age, in relation to the removal of plaque, the health of the gingivae, staining and calculus, dependability, adverse effects and cost.

Results:

- 51 trials involving 4624 participants provided data for **meta-analysis**.
- The greatest body of evidence was for rotation oscillation brushes which demonstrated a statistically significant reduction in plaque and gingivitis at both time points.
- Powered toothbrushes reduce plaque and gingivitis more than manual toothbrushing in the short and long term. The clinical importance of these findings remains unclear.

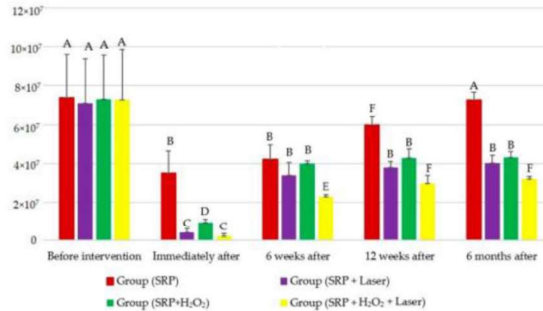
A Case for Adjunctive Therapies:

- “Although pocket debridement suppresses components of the subgingival microflora associated with periodontitis, periodontal pathogens may return to baseline levels within days or months”
- Verma SK, Maheshwari S, Singh RK, Chaudhari PK. *Laser in dentistry: An innovative tool in modern dental practice. Natl J Maxillofac Surg. 2012 Jul;3(2):124-32. doi: 10.4103/0975-5950.111342. PMID: 23833485; PMCID: PMC3700144.*

Laser + Irrigation studies

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- *Effect of Hydrogen Peroxide Photoactivated Decontamination Using 940 nm Diode Laser in Periodontal Treatment: A Pilot Study, 2020*
- *Disinfection Potential of 980 nm Diode Laser and Hydrogen Peroxide (3%) in “Critical Probing Depths” Periodontal Pockets: Retrospective Study, El Mobadder et al, 2022*



Oral Probiotics:

Benefits:

- Inhibit plaque formation.
- Reduces bleeding.
- Reduces inflammation.
- Inhibits growth of bad bacteria.
- Immune support.
- Freshen breath.
- Whitens teeth.
- Neutralizes ph.
- Simple, natural, non-invasive, safe.
- Reduces throat infections.
- Counter effect negative side effects of antibiotics.

Supportive studies:

- *Efficacy of local use of probiotics as an adjunct to scaling and root planing in chronic periodontitis and halitosis: A randomized controlled trial ~ 2016*
- *A critical appraisal of the effects of probiotics on oral health, Journal of Functional Foods, Volume 70, 2020, Parul Chugh et,*
- *Seminario-Amez M, López-López J, Estrugo-Devesa A, Ayuso-Montero R, Jané-Salas E. Probiotics and oral health: A systematic review. Med Oral Patol Oral Cir Bucal. 2017 May 1;22(3):e282-e288. doi: 10.4317/medoral.21494. PMID: 28390121; PMCID: PMC5432076.*

Scan this QR code to receive any follow up documents from today's session.



Thank you for joining me today, it has been a pleasure!