WESTON | AVENTURA
ENDODONTIC CARE

Summer 2026 Edition
REFERRAL PARTNER QUARTERLY

A LETTER FROM OUR TEAM

FALL / WINTER MOMENTS

Dr. Limosani, Dr. Tink, Dr. Leiva and the team at the Aventura Open House.

The WEC/AEC team enjoying some Halloween fun with Dr. Bruno Azevedo.

Drs. Faisal Huda and Rosi Brewer presenting on the next generation of IV sedation in dentistry.

The opening months of the year have been deliberate and focused. Our team of three endodontists — two Board-Certified Diplomates (Dr. Mark Limosani and Dr. Lauren Tink) and one Board-Eligible specialist (Dr. Karina Leiva) — continues to uphold consistent standards across the full scope of endodontic care.

Particular emphasis remains on complex endo-restorative cases, surgical endodontics, pediatric care, sedation dentistry, and nuanced diagnostic challenges. This discipline defines our work.

Continuing education is integral to our practice. It is not pursued out of obligation, but out of purpose — an ongoing commitment to advancing what is possible in preserving the natural dentition. This year, we have chosen to focus more deeply on three areas at the forefront of our specialty: ***cone beam computed tomography, endo-restorative dentistry, and sedation.***

We hosted a CBCT-focused lecture led by Dr. Bruno Azevedo, an internationally recognized authority in radiology. Nearly 50 dentists and team members attended, contributing to a highly focused and substantive exchange of ideas. Our Biomimetic Dentistry Study Club examined restorative strategies centered on the preservation and long-term function of natural dentition.

In collaboration with Anesthesia Now, we also established a Dental Sedation Study Club, where we explored the pharmacology and clinical application of remimazolam and dexmedetomidine.

Discussions emphasized patient selection, sedation depth, recovery profiles, and workflow integration. All sessions remained practical and experience-driven, with colleagues sharing protocols grounded in daily practice.

These programs take place at our Aventura office, a setting designed to support professional collaboration. The space includes a dedicated conference environment for continuing education and case review.

With Aventura established alongside Weston, both locations function as a single, unified practice — defined by the same specialists, the same team, and the same philosophy of care.

While based in South Florida, we regularly welcome patients from across the United States, the Caribbean, and internationally, including Canada, Europe, and Latin America. Our team communicates fluently in English, Spanish, French, and Russian.

Amid a full clinical calendar, the season also allowed for moments of pause — gatherings with colleagues and friends over the winter holidays, Valentine's Day, and St. Patrick's Day. These occasions, though simple, reflect the community at the center of our work.

We remain deeply appreciative of the trust placed in us by our referring doctors and patients. It is the standard by which we measure ourselves — and the reason we continue to invest in excellence.

Thank you for being part of our community.
— The Weston/Aventura Endodontic Care Team

JOIN THE BIOMIMETIC STUDY CLUB

Scan to join the "Biomimetic Penguins" WhatsApp group — case discussions, protocols, and live meeting invites with the WEC/AEC team.

JOIN OUR DENTAL SEDATION STUDY CLUB

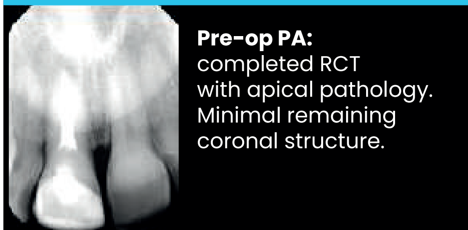
Scan to join the "South Florida Sedation Community" WhatsApp group — protocols, case discussions, and meeting invites.

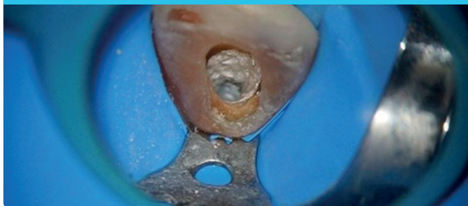
Mark A. Limosani
DMD, MSc, FRCD(c), Dip. ABE

37 -54%	89,2%	OR 3.8
Higher fracture resistance vs. conventionat.	4-year survival rate (95% CI: 84.1–94.3%)	Favorable failure vs. metal posts ($p<0.01$)

*Meta-analysis data | Khan et al. 2018; Vallittu 2015

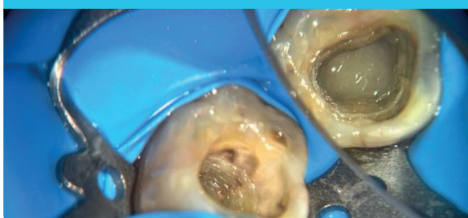
Case 1 · Maxillary Central Incisor





Polyethylene (Ribbond) fiber reinforcement placed in the peri-cervical area of the tooth.

case 2 · Mandibular molars, wallpapering technique



Intraoperative microscopic view (26x). Fiber reinforcement of the buccal, lingual, mesial, and distal walls.

Rebuilding From Within:

Biomimetic Reinforcement of Endodontically Treated Teeth

Polyethylene Fiber Applications for Enhanced Structural Longevity — A Literature Review & Clinical Case Report

Endodontically treated teeth present one of restorative dentistry's most compelling biomechanical challenges. Following root canal therapy, a tooth can lose up to 70–80% of its structural integrity — not merely from the procedure itself, but from the cumulative effects of prior decay, access cavity preparation, and the resulting dentin dehydration that reduces elasticity by as much as 14%. Biomimetic dentistry offers a compelling alternative philosophy.

Rather than imposing rigid mechanical retention on an already-compromised tooth, biomimetic principles seek to recreate the original stress-absorbing architecture of the dentin-enamel complex (DEJ). Central to this approach is the strategic use of ultra-high molecular weight polyethylene (UHMWPE) fiber reinforcement — a technique that, when executed correctly, demonstrably shifts fracture patterns from non-restorable to repairable outcomes.

The Biomechanics of Structural Loss

The natural tooth's resilience derives largely from its hierarchical structure. Enamel, with a modulus of elasticity of 70–100 GPa, absorbs compressive forces. Dentin (18–25 GPa) dissipates and redirects stress. The DEJ acts as a crack-arresting interface — when a fracture initiates in enamel, the modulus mismatch at the DEJ deflects and arrests propagation before it reaches the root.

Endodontic treatment disrupts this architecture at multiple levels. Loss of marginal ridges alone reduces cuspal stiffness by 63%. Each millimeter of pericervical dentin removed — the critical 4mm zone above and below the crestal bone — reduces tooth strength by approximately 20%. Coupled with proprioceptive loss and altered occlusal loading, the result is a structure increasingly vulnerable to the lateral forces that drive vertical root fractures.

"In endodontic buildups, every millimeter of pericervical dentin preserved significantly enhances the tooth's long-term prognosis and structural integrity."

— Clark & Khademi, DCNA 2010

Why Traditional Posts Fall Short

Cast posts and prefabricated metal posts share a critical liability: their elastic moduli (170–200 GPa for stainless steel; 40–80 GPa for zirconia) far exceed dentin's 18–25 GPa. This stiffness mismatch concentrates stress at the post-dentin interface, often producing catastrophic vertical root fractures extending below the osseous crest — non-restorable failures requiring extraction.

Fiber-reinforced composite posts reduce this mismatch but still require dentin removal for post space preparation, further compromising the pericervical zone. Polyethylene fibers circumvent this problem entirely. Their flexible, woven architecture distributes stress multidirectionally rather than concentrating it — and crucially, their placement requires no additional dentin removal.

"The synergistic effect of fiber reinforcement with adhesive technology creates biomimetic restorations that behave more like natural tooth structure."

— Deliperi, Alleman & Rudo, 2017

Why This Case Matters

- No post placed — pericervical dentin fully preserved
- Ribbond fiber distributes occlusal stress like the DEJ
- Failure mode (if any) is repairable above the CEJ
- Documented protocol; reproducible chairside in <60 min

The Wallpapering Protocol

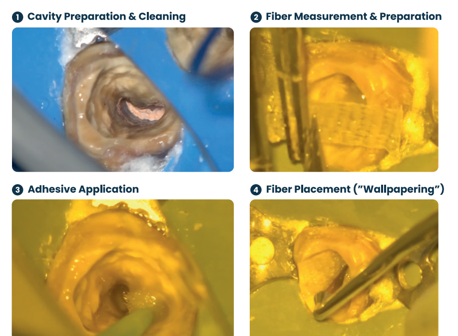
The protocol begins with meticulous isolation and conservative cavity preparation, preserving all available pericervical dentin. Rounded internal line angles minimize stress concentration. Following adhesive application (4th or 5th generation system with selective enamel etching), a strip of Ribbond (3–4mm width for posterior teeth) is measured, cut to cavity circumference plus 2mm, and thoroughly wetted with unfilled bonding resin.

Fiber is adapted circumferentially against all vertical surfaces using a ball burnisher, spot-cured in 10-second increments as it is positioned, then incrementally covered with composite in 2mm horizontal layers — each layer cured for 40 seconds from multiple angulations.

Chairside protocol checklist

- Rubber dam isolation is mandatory — moisture destroys the fiber-resin bond
- Wet fiber with unfilled resin only — never composite
- Spot-cure in 10-sec increments as fiber is adapted to cavity walls
- Ensure ≥0.5mm composite coverage over all fiber at margins
- Multi-directional curing: buccal, lingual, and occlusal — ≥40 sec/increment
- Store cut fibers under orange light shield until placement

Step-by-Step: Fiber Placement



Managing Common Errors

Despite the technique's predictability when properly executed, several failure modes deserve attention. Inadequate fiber impregnation — insufficient wetting with unfilled resin — compromises the fiber-matrix bond and negates the reinforcement effect. Incorrect fiber orientation reduces load-redistribution effectiveness; fibers should be oriented perpendicular to anticipated fracture lines. Air entrapment during adaptation creates voids that act as stress risers. Exposed fiber margins lead to staining and bacterial colonization over time.

When executed correctly, fiber-reinforced buildups consistently produce the most clinically favorable outcome: fracture above the CEJ, salvageable with conservative crown lengthening or direct repair. The catastrophic, non-restorable failure that so often follows rigid post systems becomes the exception rather than the rule.

Mark A. Limosani
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Polymerization Shrinkage and Microleakage

A secondary but clinically meaningful benefit of fiber reinforcement is its effect on polymerization shrinkage stress. Resin composites undergo volumetric shrinkage of 1.5–6% during polymerization, generating internal stresses at bonded interfaces that can exceed dentin bond strength and create marginal micro-gaps. These gaps are the primary pathway for secondary caries formation, which accounts for 50–60% of restoration replacements.

Fiber nets act as stress-breaking structures that physically interrupt polymerization shrinkage vectors. Ozel & Soyman (2009) documented a 30–45% reduction in microleakage at gingival margins when fiber nets were incorporated into Class II MOD restorations. Stavridakis et al. (2005) confirmed that fiber placement combined with incremental layering significantly reduces interfacial gap formation.

This shrinkage-reducing effect is particularly relevant in endodontic buildups, where the C-factor is inherently high, bonded surfaces are extensive, and the margin for error is clinically unforgiving.

"The synergistic effect of fiber reinforcement with adhesive technology creates biomimetic restorations that behave more like natural tooth structure."

— Deliperi, Alleman & Rudo, 2017

Patient Selection and Indications

Fiber reinforcement is most impactful in teeth with extensive coronal destruction (>50% tissue loss), deep endodontic access that has compromised structural integrity, high functional load (posterior teeth, bruxism patients), and minimal remaining cavity walls (1–2 walls).

It is also indicated in vital pulp therapy cases requiring immediate coronal reinforcement and any scenario where traditional post placement would necessitate further pericervical dentin removal.

Teeth with minimal structural compromise — intact marginal ridges and normal occlusal forces — can typically be managed with conventional adhesive restorations without the additional steps fiber placement requires.

Evidence Summary

The cumulative literature consistently supports polyethylene fiber reinforcement as a superior biomechanical strategy for endodontically compromised teeth.

Meta-analyses confirm 37–54% higher fracture resistance compared to conventional techniques ($p<0.001$), a pooled four-year survival rate of 89.2%, and an odds ratio of 3.8 favoring restorable failure modes over traditional metal post systems.

Belli et al. (2006) reported a 37% increase in fracture resistance when fibers were placed circumferentially in endodontically treated molars. Vallittu (2015) documented >90% survival rates in long-term clinical follow-ups. Khan et al.

(2018) confirmed these findings in a formal meta-analysis. The evidence quality is rated high for fracture resistance outcomes and moderate for long-term clinical performance.

Conclusion: A Paradigm Worth Adopting

Biomimetic reinforcement with UHMWPE fibers represents a genuine paradigm shift in the restoration of endodontically treated teeth.

Rather than combating structural compromise with rigid mechanical systems that concentrate stress, the wallpapering technique works with the tooth — distributing forces, reducing polymerization shrinkage, preserving pericervical dentin, and producing failure modes that can be repaired rather than extracted.

The clinical implications for your patients are direct: when we restore a tooth referred from your practice, our goal is not merely to seal the access — it is to give that tooth the best possible chance at long-term structural survival.

When To Refer For Biomimetic Consultation

- Post-RCT tooth with >50% coronal tissue loss
- Minimal or absent ferrule height
- Posterior molar with bilateral marginal ridge loss
- History of prior root fracture on a treated tooth
- Bruxism patient requiring endodontic restoration
- Any case where post placement would sacrifice pericervical dentin

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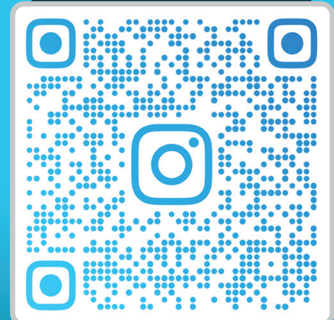
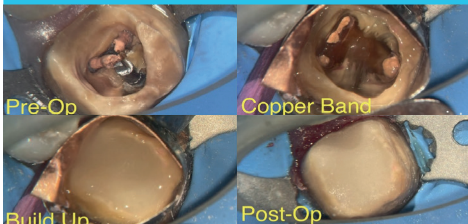
DR. LIMOSANI

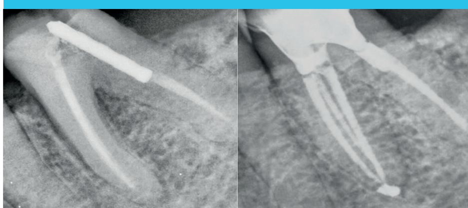


Follow **Dr. Limosani** on Instagram

Dr. Lauren Tink, DMD
Diplomate of the American Board of Endodontics

CASE 1 · Persistent Symptoms From An Untreated Mm Canal





Mandibular first molar referred for retreatment. Microscopic troughing of the mesial isthmus revealed a third orifice between MB and ML.

Post-op radiograph shows obturation of all three mesial canals, with the MM joining the ML system apically.

The Canal You're Not Finding:

Why the Middle Mesial Canal Matters in Mandibular Molars

Mandibular molars are among the most frequently treated teeth in endodontics, yet they continue to present some of the most complex anatomical challenges.

While clinicians are well acquainted with the MB and ML canals, a third canal — the middle mesial (MM) canal — may exist within the developmental groove between them. The MM canal is increasingly recognized as a frequent contributor to persistent apical pathology and endodontic failure.

With magnification, ultrasonics, and CBCT now standard in specialty practice, what was once invisible is becoming visible — but only if you know to look for it.

How Common Is It, Really?

Reported prevalence varies, but the literature places the MM canal in roughly 20% of mandibular first molars when actively searched for under the microscope. Younger patients show even higher rates, with some studies reporting prevalence above 40% in patients under 25.

Mandibular second molars are slightly less affected but far from immune. If you treat lower molars, you encounter MM canals regularly — whether you find them or not.

Why It's Missed

The MM orifice sits in the isthmus between the MB and ML canals. Its anatomy is highly variable: it may merge with the MB or ML canal, or exist as a completely independent canal with its own apical foramen.

Its orifice is frequently obscured by a dentinal shelf and is often located several millimeters apical to the orifices of the MB and ML canals.

On CBCT imaging, one may notice a broad mesial root, but a distinct orifice often cannot be seen due to its extremely small size.

Without intentional troughing of the mesial isthmus under high magnification, the orifice is undetectable. Technology and technique matter.

The Clinical Cost of Missing It

An untreated MM canal leaves behind a column of pulp tissue and bacterial biofilm. Even with excellent disinfection and obturation of the MB and ML canals, endodontic therapy can fail — sometimes immediately with persistent symptoms, sometimes years later with the development of a periapical lesion.

"Even excellent treatment of two canals cannot compensate for a third left untouched. The MM canal is often the difference between healing and recurrence."

— Karapinar-Kazandag et al., J Endod 2010

Detection: A Disciplined Search

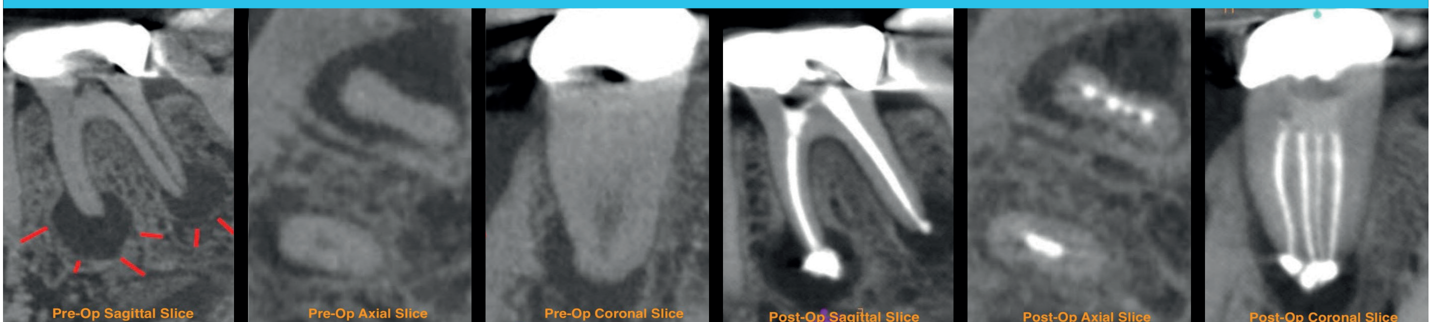
Finding the MM canal is rarely accidental. It rewards a disciplined, stepwise approach. After locating the MB and ML orifices, attention turns to the developmental groove between them — the mesial isthmus.

Under the operating microscope at high magnification, an ultrasonic tip is used to carefully trough this groove, removing the secondary dentin and the overlying dentinal shelf that conceals the orifice.

Pre-operative CBCT is invaluable. A broad mesial root, an unusually thick isthmus, or asymmetry between the MB and ML canal trajectories all suggest the possibility of an MM system.

When these features are present, additional intentional time on the isthmus is warranted.

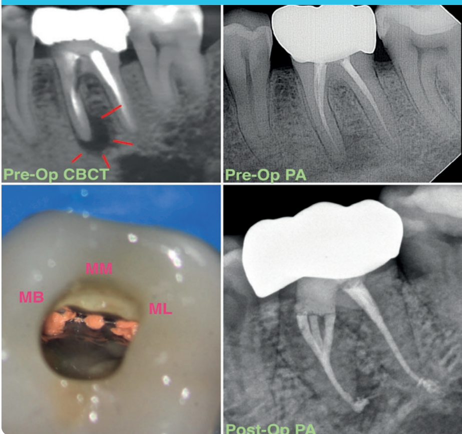
CASE 2 · Four Independent Mesial Canals



A rare case: four completely separate mesial canals in a lower first molar — ML, MB, and two independent MM canals. Each presented with its own orifice and portal of exit.

Dr. Lauren Tink, DMD
Diplomate of the American Board of Endodontics

CASE 3 · Anatomy under the microscope—mb, mm, ml

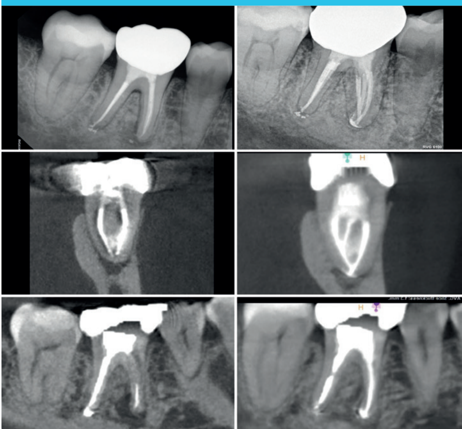


Pre-op CBCT showed apical periodontitis of the mesial root.

The clinical photo shows three mesial orifices; the MM sits in the groove between MB and ML and is typically the smallest.

Without magnification and intentional troughing it is often invisible.

CASE 4 · Healing confirmed on cbct follow-up



CASE 4 · Healing confirmed on cbct follow-up

Previously treated elsewhere; patient presented with percussion pain and intraoral fluctuant swelling.

Retreatment included locating the untreated MM canal. Follow-up CBCT demonstrates osseous healing.

Configurations You Will See

MM canals follow several patterns. Pomeranz's original classification — fin, confluent, and independent — remains a useful framework.

"Middle mesial canals are not rare findings when careful troughing is performed under high magnification."

— Nosrat et al., J Endod 2015

A fin is a narrow communication between MB and ML that does not constitute a fully separate canal. A confluent MM canal has its own orifice but joins either the MB or ML apically. An independent MM canal maintains a discrete pathway from orifice to apex, with its own portal of exit.

In our practice, the independent MM canal — though less common — is the configuration with the greatest clinical consequence. A missed fin may not cause failure.

A missed independent canal frequently does, because it harbors a separate microbial ecosystem inaccessible to disinfection of the MB or ML systems.

Implications for the Referring Dentist

Lower molars with persistent post-treatment symptoms or periapical pathology associated specifically with the mesial root warrant evaluation for an untreated MM canal.

CBCT examination is strongly indicated. When symptoms persist, anatomy should be the first hypothesis.

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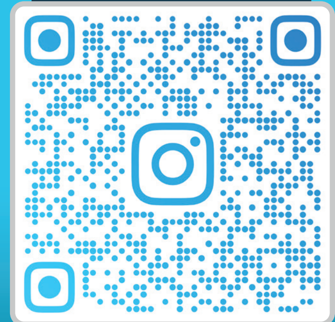
DR. TINK



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Dental Trauma and Endodontic Management:

Preserving Pulp Vitality First

A Case-Based Review: When Vital Pulp Therapy Succeeds and When Apexification Becomes Necessary

Dental trauma is common in children, adolescents, and young adults, especially involving anterior permanent teeth.

Injuries may range from enamel fractures to complicated crown fractures with pulp exposure, luxation injuries, root fractures, and avulsion. The endodontic goal is not simply to "treat the nerve," but to preserve the tooth, maintain root development when possible, prevent infection, and restore function and esthetics.

Here we review two clinical scenarios: one in which a conservative vital pulp therapy was successful, and another in which apexification was indicated following pulpal necrosis of an immature permanent tooth.

Case Report · 9 | Year-Old Male · Ellis Class III, Tooth #9

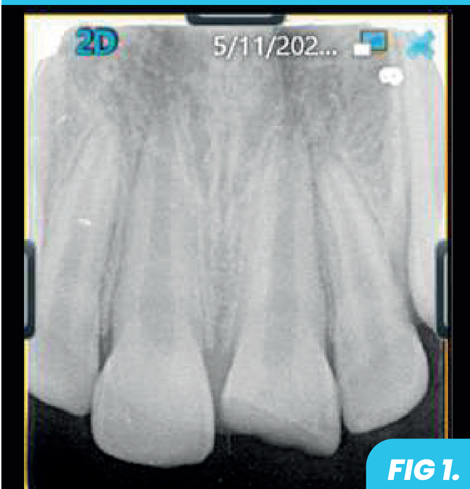

FIG 1.

Fig 1. Pre-op periapical radiograph:

complicated crown fracture of #9 with pulpal involvement. Open apex consistent with an immature permanent tooth.

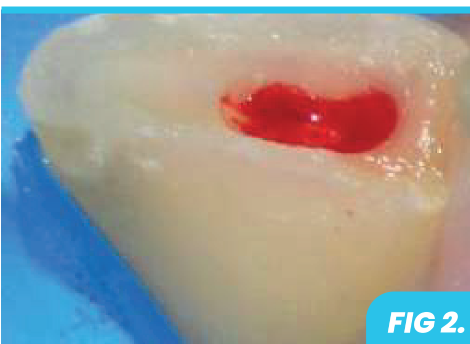
FIG 2.

Fig 2. Macro view of pulp exposure following coronal fracture.

Bright-red coronal bleeding immediately after rubber-dam isolation, prior to pulpotomy.

FIG 3.

Fig 3. Post-Cvek (partial) pulpotomy.

Hemostasis achieved with 4% NaOCl irrigation and gentle cotton-pellet pressure — controlled, healthy bleeding indicates a reversible pulpal state.

Vital Pulp Therapy as the First Option

When the traumatized tooth is restorable and the pulp is still vital, vital pulp therapy should be considered the first treatment option, especially in immature permanent teeth. Preserving pulp vitality allows continued root development, thickening of dentinal walls, and natural apical closure — a process known as apexogenesis.

The AAE notes that every effort should be made to preserve pulp vitality in immature teeth to allow continued root growth, and that vital pulp therapy can be used in both immature and mature permanent teeth when properly indicated.

Vital pulp therapy may include direct pulp capping, partial pulpotomy, or complete (full) pulpotomy, depending on the size of the exposure, degree of contamination, bleeding control, symptoms, and time since injury.

For traumatic pulp exposures, current AAPD guidance indicates that partial or full pulpotomy is generally preferred over direct pulp capping because of higher success rates in traumatic exposures.

"***Assessment of the quality of pulpal bleeding is the single most useful chairside indicator of pulpal status during vital pulp therapy.***"

— AAPD Vital Pulp Therapy Guideline, 2025

A key clinical step is assessing the quality of pulpal bleeding. If bleeding is controlled within an acceptable time and the tissue appears healthy, a calcium silicate material such as MTA or a bioceramic cement can be placed, followed by an excellent coronal seal.

The AAPD guideline recommends calcium silicate cements for vital pulp procedures and emphasizes sodium hypochlorite for hemostasis in direct pulp capping and pulpotomy procedures.

When Root Canal Treatment Becomes Necessary

Root canal treatment becomes the preferred option when the pulp is necrotic, when there are signs of irreversible pulpitis, when symptoms persist, when periapical pathology develops, or when the tooth requires endodontic treatment for restorative reasons.

The AAE emphasizes that proper pulpal and periapical diagnosis should guide treatment, and that necrosis or irreversible pulpitis typically indicates pulpectomy/root canal therapy rather than vital pulp therapy.

In mature teeth with closed apices, conventional root canal treatment is usually predictable. In immature permanent teeth with open apices and necrotic pulps, treatment is more complex because the canal walls are thin and the apex is wide open.

Apexification for Immature Necrotic Teeth

When an immature permanent tooth loses vitality after trauma, apexification may be used to create an apical barrier so the canal can be filled safely. The AAPD lists three nonvital options for permanent teeth: conventional root canal treatment, apexification, and regenerative endodontics.

Apexification can be performed using calcium hydroxide over multiple visits or, more commonly today, by placing an apical barrier with MTA or another calcium silicate cement.

However, apexification does not continue natural root development — it mainly creates an apical stop. For this reason, preserving vitality through vital pulp therapy remains preferable whenever the pulp is still vital and the tooth is restorable.

Clinical Priorities After Trauma

Successful treatment depends on early diagnosis, appropriate radiographs, pulp sensibility testing, mobility evaluation, periodontal assessment, and disciplined long-term follow-up.

Pulp tests can be unreliable immediately after trauma, so the tooth should not be diagnosed as necrotic based on a single early negative response.

Follow-up is essential to detect pulp necrosis, internal or external resorption, apical pathology, or failure of the restoration. Recall is typically performed at 1, 3, 6, and 12 months, then annually, with pulp testing and periapical imaging at each visit.

"In the immature traumatized tooth, every effort should be made to maintain pulp vitality to allow continued root development."

— AAE Position Statement on Vital Pulp Therapy, 2021

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FIG 4.

FIG 5.

FIG 6.

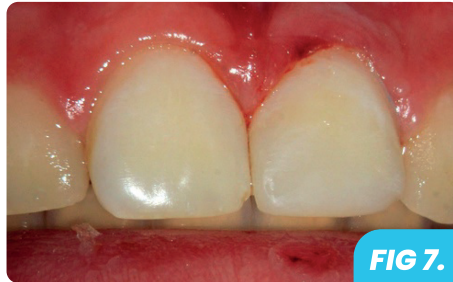

Fig 4. Bioceramic Root Repair Material (BC RRM)

placed over the amputated pulp surface to provide a biocompatible apical seal and to support continued odontoblastic activity.

Fig 5. Bioclear anatomic matrix seated

to reconstruct the lost coronal contour with predictable emergence profile and contact anatomy.

Fig 6. Glass ionomer dentin replacement over the BC RRM

then heated/injection-molded bonded composite delivered through the Bioclear matrix — a layered biomimetic buildup that protects the vital pulp beneath.

Fig 7. Two-week follow-up. Functional and esthetic restoration of #9

with healthy peri-gingival tissues. Pulp tested vital; tooth asymptomatic. Long-term recall scheduled to monitor continued root maturation.

Conclusion

In traumatic dental injuries, the most conservative biologic approach is usually best. Vital pulp therapy should be the first option when the pulp is vital, bleeding can be controlled, and the tooth is restorable. If the pulp becomes necrotic or irreversible disease develops, root canal treatment is indicated; in immature permanent teeth with open apices, apexification or regenerative endodontic therapy may be required.

The final decision should be based on pulpal diagnosis, root maturity, restorability, symptoms, radiographic findings, and patient follow-up compliance. We welcome your referrals for traumatic dental injuries — early triage often determines whether vitality can be preserved.

Decision framework — Traumatic pulp exposure

- Vital, controllable bleeding › partial or full pulpotomy with calcium silicate
- Necrotic or persistent irreversible pulpitis › root canal treatment
- Immature root + necrotic pulp › apexification (MTA/BC) or regenerative endodontics
- All paths require excellent coronal seal and disciplined follow-up

When To Refer

- Any complicated crown fracture with pulp exposure
- Luxation injuries (intrusion, extrusion, lateral, avulsion)
- Suspected root fracture or alveolar fracture
- Trauma in an immature permanent tooth (open apex)
- Patient presenting › 24 h after injury or with symptoms

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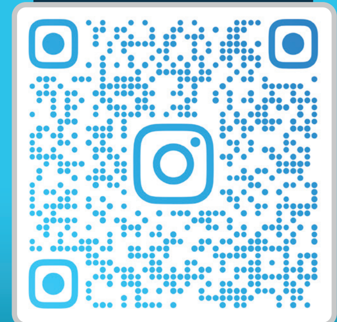

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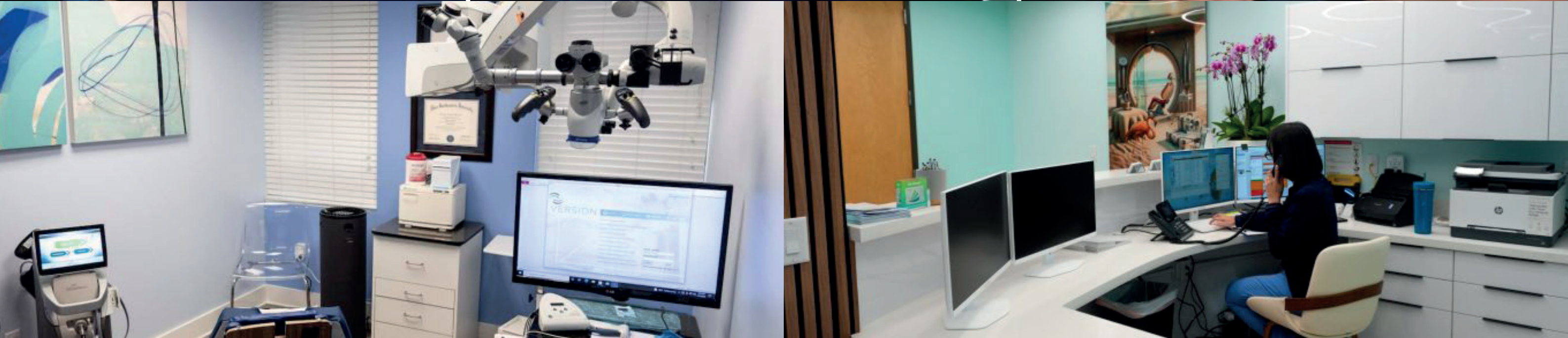

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