Multident Nano-Silver Hydrogel :

A Game Changer in Managing Infected Periapical Lesions

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Profile

Dr. Mayuresh Sopal is an experienced endodontist known for managing complex periapical infections and challenging root canal cases. His practice integrates evidence-based endodontic protocols with innovative antimicrobial strategies to optimize patient outcomes. As an early adopter of nano-silver hydrogel technology for intracanal disinfection, he has successfully treated severe periapical infections refractory to conventional antibiotic therapy and actively shares his clinical experience to advance alternative antimicrobial approaches in endodontics.

Abstract

Severe periapical infections can be challenging to manage, especially when systemic antibiotics and anti-inflammatory drugs fail to provide relief. This case series reports the successful use of Multident Nano-Silver Hydrogel as an intracanal medicament in two patients with acute periapical infections of differing etiologies. The hydrogel was delivered intracanally using a syringe and lentulo spiral to achieve periapical penetration. Both patients showed marked pain reduction within the 5-day medicament period, demonstrating effective pathogen elimination and control of inflammation. These findings support Multident as a valuable adjunct in endodontic management, particularly for infections refractory to conventional systemic therapy.

Clinical Context

Periapical infections result from bacterial invasion of periradicular tissues, causing pain, inflammation, and possible spread. While standard care involves chemomechanical debridement, intracanal medicaments, and antibiotics, some cases remain refractory. Nano-silver hydrogels provide sustained antimicrobial action via controlled ionic release, disrupting biofilms and eliminating resistant pathogens such as *E. faecalis*, *P. gingivalis*, and *F. nucleatum*[1], [2] while also reducing inflammatory cytokines (IL-1β, TNF-α)[2],[3]. Use of Multident Hydrogel as an intracanal medicament with periapical extension enabled rapid pain relief and infection control where antibiotics alone were inadequate[3].

Case 1

Traumatic Pulp Exposure with Acute Periapical Infection

Patient Summary & Management:

Patient

34 YEAR old

Female

presented with pain and sensitivity in the maxillary right lateral incisor (tooth 12) following accidental trauma causing an incisal fracture with pulpal exposure. Trauma occurred 4 days prior to presentation, during which severe pain developed, progressing from acute pulpitis to early periapical involvement. Clinical examination showed tenderness and periapical inflammation, with minimal relief despite prior antibiotics and anti-inflammatory therapy.

Treatment: Emergency root canal treatment was initiated 4 days post-trauma. Owing to severe periapical infection unresponsive to systemic antibiotics, Multident gel was selected as an intracanal medicament.

Multident Protocol

Indication: Traumatic pulp exposure with periapical infection

Rationale: Delayed presentation with bacterial colonization and periapical extension

Delivery: Intracanal placement using syringe and lentulo spiral, allowing periapical extension

Duration: 5-day intracanal medicament

Seal: Temporary restoration placed to ensure coronal seal

Figure 1A – Pre-treatment radiograph (Before Treatment)

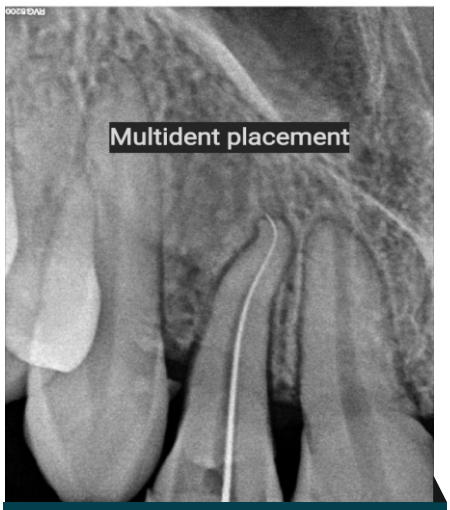

Figure 1B – Intracanal placement of Multident Nano-Silver Hydrogel

Figure 1C – Post-treatment radiograph (After Treatment)

Figure 1. Radiographic sequence demonstrating Multident Nano-Silver Hydrogel–assisted healing in traumatic periapical infection

Follow-Up & Outcome

- **Days 1-3:** Progressive pain reduction with marked improvement by day 3
- **Day 5:** Complete pain resolution at medicament removal
- **Examination:** No tenderness to percussion or palpation; periapical inflammation resolved
- **Treatment:** Root canal therapy completed with standard obturation
- **3-week follow-up:** Patient remained asymptomatic with radiographic evidence of periapical healing

Clinical Insight: In traumatic injuries with delayed treatment, the window for bacterial invasion and periapical spread is critical. Multident's ability to penetrate beyond the apical foramen and directly address periapical pathogens proved invaluable in this case, providing infection control that systemic antibiotics alone could not achieve.

Case 2 Severe Periapical Infection Secondary to Dental Attrition

Patient Summary & Management:

Patient 27 YEAR old **Female**

presented with severe pain in the mandibular anterior region due to progressive attrition of teeth 31 and 41, resulting in pulpal exposure and infection. Clinical findings showed marked attrition, tenderness to percussion and palpation, and radiographic periapical radiolucency, with pain unrelieved by analgesics or systemic antibiotics.

Treatment: Root canal treatment was initiated for both mandibular central incisors.

Multident Protocol

- **Indication:** Severe periapical infection refractory to antibiotics and anti-inflammatory therapy
- **Rationale:** Persistent pain despite high-dose antibiotics; selection of Multident Nano-Silver Hydrogel for targeted antimicrobial and anti-inflammatory action
- **Delivery:** Intracanal placement using syringe and lentulo spiral with periapical penetration
- **Duration:** 5-day intracanal medicament
- **Seal:** Temporary sealing of access cavities to maintain medicament contact

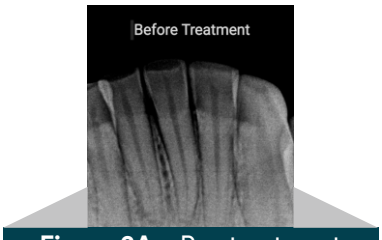

Figure 2A – Pre-treatment radiograph (Before Treatment)

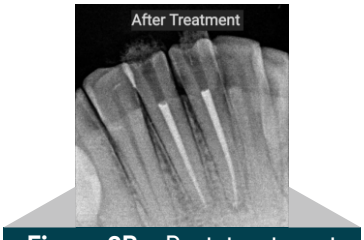

Figure 2B – Post-treatment radiograph (After Treatment)

Figure 2. Radiographic evidence of rapid clinical resolution in attrition -induced periapical infection following Multident application

Follow-Up & Outcome

- **Days 1-2:** Patient reported significant reduction in pain intensity within 24-48 hours of medicament placement
- **Day 5:** At medicament removal appointment, patient was essentially pain-free with no spontaneous discomfort
- Follow-up examination revealed resolution of tenderness to percussion and palpation
- Root canal treatment was completed successfully with conventional obturation
- **2-week follow-up:** Complete symptom resolution with normal periapical findings

Clinical Insight: In this case of attrition-induced periapical infection, the direct antimicrobial action of nano-silver in the periapical zone provided rapid clinical improvement that systemic antibiotics could not achieve. The dramatic pain reduction enabled comfortable completion of endodontic treatment.

Mechanism Summary

Mechanism	Molecular Effect	Clinical Outcome
Antimicrobial	Disrupts bacterial cell walls and biofilm integrity in periapical zone[1,2]	Rapid pathogen elimination
Anti-inflammatory	Suppresses IL-1β, TNF-α, and other inflammatory mediators[2,3]	Dramatic pain reduction within 24-48 hours
Tissue Regenerative	Promotes fibroblast activity and cellular repair mechanisms[3]	Enhanced periapical healing

Conclusion

These cases highlight Multident Nano-Silver Hydrogel as an important advancement in endodontic infection management, delivering rapid pain relief and effective infection control in cases resistant to systemic therapy. By providing targeted local antimicrobial action, it addresses challenges posed by antibiotic resistance and treatment-refractory periapical infections while minimizing systemic drug exposure. The consistent and marked clinical improvement in both patients supports the incorporation of Multident into contemporary endodontic protocols, particularly for severe periapical infections where conventional approaches are insufficient.

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References: **1.** Raghav P, Khera AK, Bisht S. Comparative evaluation of antimicrobial properties of silver nanoparticles and chlorhexidine mouthwashes. J Clin Orthod Dent. 2023. **2.** Hernández-Sierra JF et al. Bactericidal activity of silver nanoparticles on oral biofilms related to periodontal disease. Bioengineering. 2022;14(6):311. **3.** Chen S et al. Comparison of antimicrobial and wound-healing effects of silver nanoparticle and chlorhexidine mouthwashes. Clin Oral Invest. 2022.