

Review Article

Alveolar Osteitis: An Overview of Diagnosis and Contemporary Management Strategies

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Abstract: Alveolar osteitis is a frequent postoperative complication following dental extraction, particularly affecting the mandibular third molars. This condition manifests as severe postextraction pain accompanied by partial or complete loss of the blood clot within the extraction socket. Clinical diagnosis relies on characteristic features, including escalating pain beginning 1-3 days postoperatively and exposed alveolar bone. Management strategies encompass preventive measures using antimicrobial agents and therapeutic interventions, including irrigation, medicated dressings, platelet-rich preparations, and photobiomodulation therapy.

Keywords: Alveolar Osteitis, Dry Socket, Postextraction Pain.

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INTRODUCTION

Alveolar osteitis, commonly termed dry socket, occurs in approximately 0.5-5 % of routine extractions, with an incidence of 1-37.5 % following surgical removal of impacted mandibular third molars [1]. This condition results from the disruption or loss of the protective blood clot that normally forms within the extraction sockets [2]. Although the exact pathogenesis remains incompletely understood, increased fibrinolytic activity leading to premature clot breakdown represents the most widely accepted mechanism [1]. This review provides a summary of the current literature regarding the diagnostic criteria and therapeutic approaches for managing alveolar osteitis.

Diagnostic Criteria and Clinical Presentation

The standardized diagnostic criteria establish that alveolar osteitis manifests as continuous throbbing pain developing 1-3 days following tooth extraction, intensifying progressively rather than diminishing [1]. Clinical examination reveals a socket partially or completely devoid of blood clots with visible exposed alveolar bone [2]. Additional features may include

halitosis, an unpleasant taste, localized lymphadenopathy, and regional soft tissue swelling [1]. Pain is typically refractory to mild analgesics, prompting multiple postoperative visits [3]. Differential diagnoses should exclude other postextraction complications, including alveolar osteomyelitis, retained root fragments, and acute maxillary sinusitis.

Risk Factors and Prevention Strategies

Multiple patient-related and procedural factors influence the development of alveolar osteitis. Prior surgical site infection, tobacco smoking, and traumatic extraction significantly increase the risk of dry socket [4]. Female patients using oral contraceptives demonstrate an elevated incidence, likely related to the fibrinolytic effects of estrogen [4]. Complex surgical extractions that require extensive bone removal are associated with higher complication rates [1].

Chlorhexidine is the most extensively studied preventive agent. Meta-analyses demonstrate that chlorhexidine application—whether as rinse or gel formulation—significantly reduces alveolar osteitis incidence following third molar extraction [5, 6]. Gel

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formulations, when placed intra-alveolarly immediately postextraction was found effective without adverse reactions [6]. Multiple-day rinse protocols (starting on the day of surgery and continuing postoperatively) are more effective than single-application approaches [5]. Intra-alveolar chlorhexidine gel application has been shown to reduce dry socket incidence by 22 % in controlled trials [7].

Therapeutic Management Approaches

Conservative Management:

The initial treatment involves gentle intra-alveolar irrigation with saline or chlorhexidine solution to remove debris and reduce the bacterial load, although irrigation alone provides limited pain relief [1-8]. Socket curettage is contraindicated because it further exposes the bone and delays healing [2].

Medicated Dressings:

Various obtundent dressings containing eugenol, benzocaine, or iodoform provide temporary pain relief. Alvogyl (butamben, iodoform, and eugenol mixture) is effective in pain reduction, although comparative studies show varying results against alternative treatments [8]. These dressings require replacement every 24-48 hours until the symptoms resolve [3].

Platelet-Rich Fibrin (PRF):

Autologous PRF application has shown promising results for both prevention and treatment. A systematic review indicated that PRF significantly reduces the incidence of alveolar osteitis and accelerates healing [9]. In therapeutic applications, PRF placement reduced pain scores and promoted granulation tissue formation at established dry socket sites, with statistically significant improvements by postoperative day 3 [10]. Advanced PRF formulations (A-PRF+) demonstrate enhanced healing effects on both hard and soft tissues while effectively reducing pain [11]. Prophylactic PRF placement reduced the incidence of localized osteitis by 50 % (from 9.5 % to 4.5 %) in mandibular third molar sites [12].

Photobiomodulation Therapy:

Low-level laser therapy offers a minimally invasive treatment alternative. Studies utilizing diode lasers at 808 nm wavelength (7.64 J/cm²) demonstrated superior pain management compared to conventional Alvogyl dressing [13]. A meta-analysis confirmed the effectiveness of laser treatment in addressing alveolar osteitis, although the optimal parameters varied across different protocols [14]. Red laser protocols (632-660 nm) show particularly rapid pain reduction by day 2-3 post-intervention [13].

CONCLUSION

Alveolar osteitis diagnosis relies on clinical criteria of escalating postextraction pain with exposed bone. Evidence supports the use of chlorhexidine for

prevention and multimodal management, combining irrigation, PRF application, and photobiomodulation therapy for established cases. Individualized treatment selection should consider resource availability, patient factors, and clinician expertise to optimize the outcomes.

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