

Current Concepts For Treatment of Alveolar Osteitis “Dry Socket Revisited”

Dr. Mayank Singhal¹, Dr. Nidhi Singhal², Dr. Neelesh Sonal³

Reader¹, HOD², Private Practitioner³, Department of Oral Maxillofacial Surgery, Santosh Dental College¹, Ghaziabad, GHUC²,

Abstract:

Alveolar osteitis (AO) is a well known complication which occurs after dental extraction. It is commonly known as Dry Socket. Its incidence is approximately 3% for all routine extractions and can reach over 30% for impacted mandibular third molars¹. One of the great clinical challenges since the first case was reported has been the in consistence and differences in the various definitions of dry socket and the criteria used for diagnosis. The treatment of AO includes conventional methods like use of antibiotics, medicated gauze, gel, rinse. It is associated with postoperative pain in and around the extraction site, accompanied by a partially or totally disintegrated blood clot within the alveolar socket, with or without halitosis^{2,3}. The main objective of this article is to provide a better basis for clinical management of the condition. In addition, the need for identification and elimination of the risk factors as well as preventive and symptomatic management of the condition are discussed.

How to cite this Article: Singhal M, Singhal N, Sonal N. Current Concepts For Treatment of Alveolar Osteitis" Dry Socket Revisited". HTAJOC.D.2018

Introduction:

Dry socket is a serious complication that occurs after tooth extraction. Crawford was the first to describe it in the literature in 1896¹. There are various names of dry socket – alveolitis sicca, dry socket, alveolitis sicca dolorosa, alveolar osteitis, local osteitis, fibrinolytic osteitis, septic socket, etc^{4,5}. The process occurs with the partial or total destruction of the blood clot with or without halitosis and with or without affecting the surrounding tissues^{6,7}. The etiology of dry socket is not fully clarified, but the fibrinolysis and collapse of the blood coagulum as a result of bacterial invasion is the most common cause. Prevention and treatment of dry socket includes changes in the surgical technique, use of antibiotics, mouth rinsing with antimicrobial agents before the extraction, socket lavage, placement of different medications in the socket, PRF following tooth extraction to accelerate healing.

Incidence

The incidence of dry socket is 10 times more in mandible when compared to maxilla ranging from 1 to 4% of extractions, reaching 45% for mandibular third molars.^{8,9} Dry socket may affect women in ratio of 5:1 with respect to males.^{10,11} Due to changes in endogenous estrogens during the menstrual cycle since estrogens activate the fibrinolytic system in an indirect way in females.¹²

Risk Factors

1. Surgical trauma and difficulty of extraction: This could be due to more liberation of direct tissue activators secondary to bone marrow inflammation following more traumatic extractions.¹³

2. Mandibular third molars: Some authors believe that increased bone density, decreased vascularity, and reduced capacity of producing granulation tissue are responsible for the site specificity.¹⁵

3. Systemic disease: Immunocompromised or diabetic patients being prone to development of AO due to altered healing.⁸

4. Oral contraceptives: Increase in use of oral contraceptives positively correlates with incidence of AO. Estrogen has been proposed to play significant role in fibrinolytic process. It is believed to indirectly activate the fibrinolytic

system and therefore increase lysis of the blood clot.¹⁶

5. Smoking: Studies reported that among patients with surgically removed mandibular third molars, who smoked half-pack of cigarettes per day had four- to five-fold increase in AO compared to nonsmoking patients.¹⁶

6. Physical dislodgement of the clot: Physical dislodgement of the blood clot caused by manipulation or negative pressure created via sucking on a straw would be a major contributor to AO.⁶

7. Bacterial infection: Nitzan et al observed high plasmin-like fibrinolytic activities from cultures of *Treponema denticola*, a microorganism present in periodontal disease.¹⁷

8. Excessive irrigation or curettage of alveolus: Excessive repeated irrigation of alveolus might interfere with clot formation and violent curettage might injure the alveolar bone.¹⁸

9. Bone/root fragments in the wound: Simpson showed that small bone/root fragments are commonly present after extractions and these fragments do not cause complications as they are often externalized by the oral epithelium.¹⁹

Pathogenesis

In AO there is increased local fibrinolysis which leads to disintegration of the clot by conversion of plasminogen to plasmin. Fibrinolysis is the result of plasminogen pathway activation, which can be via direct (physiologic) or indirect (nonphysiologic) activator substances.¹⁸ Direct activators are released after trauma to the alveolar bone cells. Indirect activators are released by bacteria. Fibrinolytic activity is local because initial absorption of plasminogen into the clot limits the activity of plasmin.²⁰

Prevention/Treatment:

Since AO is the most common postoperative complication after extraction, many researchers have attempted to find a successful method for prevention. Antibiotics: Systemic antibiotics like penicillin's, clindamycin, erythromycin and metronidazole are effective in preventing AO¹⁰. Local application of tetracycline in the form of powder, aqueous suspension, gauze drain and gel foam sponges show promising results in reducing incidence of AO when compared to

other antibiotics.²¹

Chlorhexidine:

A 50% reduction in the incidence of AO was observed in patients who prerinsed for 30 seconds with 0.12% CHX solution.² Use of 0.2% bioadhesive CHX gel reduced incidence of AO.²² Eugenol containing dressing: Eugenol acts as an obtundent. Commercially available dressing Alvogyl® (contains eugenol, butamben and iodoform) should be replaced every 2 days. The incidence of AO was seen 8% in sockets which were immediately packed with medicated dressing and 26% in sockets which were not immediately packed.^{23,24} Antifibrinolytics: Tranexamic acids have been reported to be used to prevent incidence of alveolar osteitis.²⁵ Low level laser therapy (LLLT): It was found that low level laser therapy (LLLT) increases speed of wound healing LLLT is applied after irrigation of socket with continuous-mode diode laser irradiation (808 nm, 100 mW, 60 seconds, 7.64 J/cm²).²⁶

Topical hemostatic agent and oxidized cellulose foam, showed reduced incidence of AO.

PRP and PRF: Studies reported substantial reduction in the incidence of AO following treatment of the extraction site with PRP and or combination of PRF and gelatin sponge.^{27,28}

Conclusion:

The occurrence of dry socket in an everyday dental practice is unavoidable. Surgeons must recognize this risk factors in patients with particular medical conditions and include this information as a part of the informed consent, some of this factor could be Smoking, surgical trauma, single extractions, age, sex, medical history, systemic disorder, extraction site, amount of anesthesia, operator experience, antibiotics use prior to surgery, difficulty of the surgery and the previous surgical site infection in addition to oral contraceptive use and menstrual cycle.

Treatment options for this condition are generally limited and directed toward palliative care.

References:

1. Bowe DC, Rogers S, Stassen LFA. The management of dry socket/alveolar osteitis. J Ir Dent Assoc. 2011;57:305-10.
2. Blum IR. Contemporary views on dry socket (alveolar osteitis): a clinical appraisal of standardization,

Singhal, et al.: Current Concepts For Treatment of Alveolar Osteitis “Dry Socket Revisited”

- etiopathogenesis and management. *Int J Oral Maxillofac Surg* 2002;31:309-317.
- Torres-Lagares D, Serrera-Figallo MA, Romero-Ruiz MM. Update on dry socket: a review of the literature. *Med Oral Pathol Oral Cir Buccal* 2005;10:77-85.
 - Chenchev Iv, Cholakova R, N Kanazirski N, Neychev D. [Influence of oral contraception and smoking on occurrence a dry socket.] *Scientific Research of Union of Scientists in Bulgaria- Plovdiv. Medicine, Pharmacy and Dental medicine. 2007; series G (VIII): 278-281.* [in Bulgarian]
 - Parthasarathi K, Smith A, Chandu A. Factors affecting incidence of dry socket: a prospective community- based study. *J Oral Maxillofac Surg.* 2011 Jul;69(7):1880-4. [PubMed] [CrossRef]
 - Cardoso C L, Rodrigues M V, Ferreira O, Garlet G P, de Carvalho PP. Clinical concepts of dry socket. *J Oral Maxillofac Surg.* 2010 Aug;68(8): 1922-32. [PubMed] [CrossRef]
 - Blum IR. Contemporary views on dry socket (alveolar osteitis): a clinical appraisal of standardization, aetiopathogenesis and management: a critical review. *Int J Oral Maxillofac J of IMAB.* 2017 Jul-Sep;23(3) <https://www.journal-imab-bg.org> 1705 Surg. 2002 Jun;31(3):309-17
 - Noroozi AR, Philbert RF. Modern concepts in understanding and management of the dry socket syndrome: comprehensive review of the literature. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009;107:30-35.
 - Oginno FO. Dry socket: a prospective study of prevalent risk factors in a Nigerian population. *J Oral Maxillofac Surg* 2008; 66:2290-2295.
 - Torres-Lagares D, Serrera-Figallo MA, Romero-Ruiz MM. Update on dry socket: a review of the literature. *Med Oral Pathol Oral Cir Buccal* 2005;10:77-85.
 - Kolokythas A, Olech E, Miloro M. Alveolar osteitis: a comprehensive review of concepts and controversies. *Int J Dent* 2010;2010:1-10.
 - Karnure M, Munot N. Review on conventional and novel techniques for treatment of alveolar osteitis. *Asian J Pharm Clin Res* 2012;6:13-17.
 - Nusair YM, Abu Younis MH. Prevalence, clinical picture and risk factors of dry socket in a Jordanian Dental Teaching Center. *Journal of Contemporary Dental Practice* 2007;8:53-63.
 - Larsen PE. Alveolar osteitis after surgical removal of impacted mandibular third molars: identification of the patient at risk. *Oral Surg Oral Med Oral Pathol* 1992;73:393-397.
 - Amaratunga NA, Senaratne CM. A clinical study of dry socket in Sri Lanka. *British J Oral and Maxillofac Surg* 1988;26: 410-418.
 - Sweet JB, Butler DP. Predisposing and operative factors: effect on the incidence of localized osteitis in mandibular third-molar surgery. *Oral Surg Oral Med Oral Pathol* 1978;46:206-215.
 - Nitzan D, Sperry JF, Wilkins TD. Fibrinolytic activity of oral anaerobic bacteria. *Archives of Oral Biology* 1978;23:465-470.
 - Brin H. Etiology and pathogenesis of fibrinolytic alveolitis (dry socket). *Int J Oral Surg* 1973;2:215-263.
 - Simpson E. The healing of extraction wounds. *British Dental Journal* 1969;126:550-557.
 - Kolokythas A, Olech E, Miloro M. Alveolar osteitis: a comprehensive review of concepts and controversies. *Int J Dent* 2010;2010:1-10.
 - Hedstrom L, Sjogren P. Effect estimates and methodological quality of randomized controlled trials about prevention of alveolar osteitis following tooth extraction. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;103:8-15.
 - Bowe DC, Rogers S, Stassen LF. The management of dry socket/ alveolar osteitis. *J Ir Dent Assoc* 2011;57:305-310.
 - Loomer CR. Alveolar osteitis prevention by immediate placement of medicated packing. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000;90:282-284.
 - Gersel-Pedersen N. Tranexamic acid in alveolar sockets in the prevention of alveolitis sicca dolorosa. *Int J Oral Surg* 1979;8: 421-429.
 - Tsirlis AT, Iakovidis DP, Parisis NA. Dry socket: frequency of occurrence after intraligamentary anesthesia. *Quintessence International* 1992;23:575-577.
 - Kaya GS, Yapici G, Savas Z, Gungormus M. Comparison of alvogyl, SaliCept patch, and low-level laser therapy in the management of alveolar osteitis. *J Oral Maxillofac Surg* 2011; 69:1571-1577.
 - Rutkowski JL, et al. Inhibition of alveolar osteitis in mandibular tooth extraction sites using platelet-rich plasma. *Journal of Oral Implantology* 2007;33.
 - Pal US, Singh BP, Verma V. Comparative evaluation of zinc oxide eugenol versus gelatin sponge soaked in plasma rich in growth factor in the treatment of dry socket. *Contemporary Clinical Dentistry* 2013;4(1):37-41.