Management of socket after extraction – A review

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INTRODUCTION

Tooth extraction is a common dental practice and is best recurrently done by general dental practitioners. In spite of the stable reduction in repetitive extraction of permanent teeth enumerated in the past decades, general dental practitioners from European countries may extract up to 7 teeth/week. An estimated 17% of patients undergo extractions over a 5-year period, with the maximum tooth extraction percentage per patient being between patients in the sixth and seventh decades of life. The foremost motives for extraction of permanent teeth are still caries and periodontal disease. Wisdom teeth inadequate to erupt or erupting only partly characterizes a separate group of dental components called impacted (third molar) teeth. In fact, impacted wisdom teeth are extracted either as of local inflammatory problems or to escape likely upcoming complications. The main objective for a successful surgery is to reduce, as much as possible, patient discomposure in the post-operative period subsequently to tooth extraction. Symptoms such as pain, swelling, trismus, fever, and dry socket are complications which are unpleasant for patients and could produce struggle in mastication, in talking, in the accomplishment of oral hygiene, and modification of other activities of daily living, causing in days off from work or study. All these complications depend on the inflammatory response, but they can be due to preceding infection, for example, if surgical trauma is in a contaminated area or where more complex and aggressive procedures are done. This review is all about the management of post-extraction socket using medication.

Post-extraction Healing

Uneventful healing of a post-extraction alveolus happens in maximum cases subsequent to dental extraction. On the other hand, sometimes healing is problematical even in normal healthy patients. Few extraction wounds, likely at 1.0–11.5%, have been stated to heal inadequately or partly. Although the occurrence of complications with post-extraction alveolus healing is negligible, the problems produced by the conflicts in post-extraction wound healing are not only restricted to localized symptoms (pain, exudate discharge, and foul odor). Disturbed healing can also complicate or even endanger dental implant placement and other procedures. Three different types of complications of healing of post-extraction

ABSTRACT

Tooth extraction is a surgical treatment to eliminate teeth that are affected by caries or gingival infection. The further mutual purpose for tooth extraction, achieved by oral surgeons, is to eradicate third molar teeth that are poorly associated/developed or those triggering soreness or swelling. The possibility of contamination after extracting third teeth from healthy young individuals is around 10%; conversely, it may be up to 25% in patients who are previously sick or have low immunity. Infectious problems include swelling, pain, pus drainage, fever, and also dry socket. Management of these infections is mostly simple and includes patients receiving antibiotics and drainage of infection from the wound. The further most common symptoms for tooth extractions are dental caries and periodontal infections, and general dental practitioners commonly do these extractions. Antibiotics may be suggested to patients undertaking extractions to avoid difficulties due to infection. The aim of the study was to review the management of socket after extraction using medication.

KEY WORDS: Antibiotics, Blood clot, Complication, Extraction socket, Pain

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osteitis (dry socket), a painful condition which follows the complication of putative bacterial origin is alveolar abscess, pain, fever, swelling, and trismus. Another post-extraction infectious complications include muscle spasm 7 days post-extraction. Signs of result on the manifestation of fever, swelling, or pain could be a key issue notifying patients to hunt out specialized care out of concern for disturbed healing. Normal uncomplicated alveolus healing has, additionally, been delineated to cause moderate to severe pain. After the exclusion of a tooth, hemorrhage or simply discharge ordinarily happens. Compression is applied by biting on a gauze swab, and coagulum forms within the socket. Now and then, ½ h of continuous compression is important to completely stop bleeding. Deviating the mandible therefore deducts the compression applied on the socket, rather than keeping continuous pressure and leads to be a common cause that hemorrhage won’t terminate. Some oral surgeons regularly scrape the walls of a socket to boost bleeding in the conviction that this will decrease the chance of dry socket, but there is no proof that this practice works. The chance of additional bleeding decreases as healing progresses and is unlikely after 24 h. The blood clot is enclosed by epithelial cells which multiply from the gingival mucosa of socket margins, pleasing almost 10 days to fully cover the defect. In the clot, neutrophils and macrophages are involved as an inflammatory response takes place. The proliferative and synthesizing phase next follows, characterized by multiplying of osteogenic cells frothed adjacent bone marrow in the alveolar bone. Bone development starts after about 10 days from when the tooth was extracted. Later 10–12 weeks, the shape of the socket is no longer obvious on an X-ray image. Bone remodeling as the alveolus acclimates to the edentulous state happens in the longer term as the alveolar process slowly resorbs. In maxillary posterior teeth, the degree of pneumatization of the sinus may additionally improve because the antral floor remodels.

Antibiotics

Antibiotics are prescribed by dental professionals to cut back the risks of certain post-extraction complications. There is proof that the use of antibiotics before or once impacted molar extraction reduces the danger of infections by 70% and lowers incidence of alveolar osteitis by one-third. Use of antibiotics does not appear to possess an immediate result on the manifestation of fever, swelling, or muscle spasm 7 days post-extraction. Signs of post-extraction infectious complications include abscess, pain, fever, swelling, and trismus. Another complication of putative bacterial origin is alveolar osteitis (dry socket), a painful condition which follows the dissolution of the blood clot which occurs as a result of bacterial invasion. The overall incidence of post-operative infections is relatively low; however, antibiotics are frequently prescribed in a prophylactic way, particularly in case of complicated surgeries and patients with systemic conditions potentially causing immunodeficiencies such as HIV infection, diabetes, and cancer. There is a range of antibiotics which are effective in treating dental infections. These include penicillin, amoxicillin, erythromycin, clindamycin, doxycycline, and metronidazole, which are usually administered orally, between 1 and 4 times daily. Alternatively, antibiotics can also be administered by parenteral or local routes.

Pain Management

Pain management in dentistry can be a real challenge. The key to managing pain lies in understanding whether what you do to patients will or will not create an inflammatory response, which is what activates the pain-producing mediators in tissue. In general, procedures on hard tooth structure that do not involve the pulp create little or no inflammatory response, but, when soft tissues are traumatized, a pain response can be expected. Oral medications that reduce pain, administered pre or postoperatively, improve clinical outcomes, making them an integral part of dental practice. Analgesic medications in dentistry are indicated for the relief of acute pain, post-operative pain, and chronic pain, and for controlling adjunctive intraoperative pain. In addition, these medications can be given preoperatively, to mitigate both post-operative pain and reduce post-operative pain medication requirement. Alleviating pain is of the utmost importance when treating dental patients, as it is prevalent and has far-reaching implications, for both the patient and the clinician. The major cause of pain is thought to be the release of inflammatory mediators that activate sensory nociceptors surrounding the tooth. The resultant stimulation of both central and peripheral mechanisms is referred to as hyperalgesia and defined as an increase in the perceived magnitude of a painful stimulus. Given that the mechanisms involved are occurring at the periphery, an anti-inflammatory agent should be used to control this process. Nonsteroidal anti-inflammatory drugs (NSAIDs) are among the most widely prescribed analgesics for the management of post-operative pain in dental patients. NSAIDs that have been approved by the US Food and Drug Administration (FDA) for over-the-counter (OTC) analgesic use can be divided into three groups: salicylates (i.e., aspirin, salicylic acid, and diflunisal), propionic acid derivatives (i.e., ibuprofen, naproxen, and ketoprofen), and the para-aminophenol derivative acetaminophen. The analgesic effect of NSAIDs is primarily the result of their inactivation of cyclooxygenase, an enzyme that converts arachidonic acid into eicosanoids such as prostaglandins and leukotrienes. Two forms of
cyclooxygenase have been identified: COX-1, which is constitutive and exists in the stomach, intestines, kidneys, and platelets, and COX-2, which is expressed as part of the inflammatory process.[19] Ibuprofen is a nonselective inhibitor of cyclooxygenase and is available as both a prescription and OTC product.[20] Conversely, celecoxib introduced as a prescription drug in January 1999, selectively inhibits the COX-2 form of the enzyme.[21] More recently, celecoxib was approved by the FDA for acute analgesia with directions to use 400 mg as an initial loading dose followed by 200 mg every 24 h.

**Socket Preservation**

Socket preservation may be a procedure that reduces bone and soft tissue loss once tooth extraction. It is performed immediately after tooth extraction. It has been found that ridge preservation procedures following tooth extraction result in the greater orofacial dimension of the bone when compared with cases where no ridge preservation procedures are completed.[22] Socket preservation is indicated as a tooth extraction can have a significant impact on the facial bone height.[23] After 8 weeks of curing there is, on normal, 20% horizontal resorption then a 50% fall of vertical bone wall height.[24] Immediate implant placement does not counteract alveolar ridge modeling when tooth extraction.[25] Socket preservation compensates for the biological resorption of the facial bone wall. It aids implant placement and can reduce the need for later bone augmentation. By reducing the marginal bone loss on adjacent teeth and accelerating bone formation, it can increase implant survival and success.[24]

Socket preservation should be considered when: [26]
- Implant placement needs to be delayed for the patient or site-related reasons
- In situations where implant placement for some reason needs to be postponed for more than months
- Future fixed partial denture pontic site is planned.

**Post-extraction Healing**

The alveolar process resorbs after tooth extraction, significantly impacting oral rehabilitation with dental implants and other types of prosthesis. Subsequent tooth extraction, the blood clot procedures and protective cells such as polymorphonucleocytes migrate into the socket to support fight infection. Bundle bone lines the socket with remnants of the periodontal ligament. Coagulate mortification happens and a tentative matrix is formed with fresh formed blood vessels beside immature collagen fibers. By day 7, the bundle bone begins to break down and osteoclastic activity creates gaps within this bone. New blood vessels access the socket and newly woven bone forms around angiogenesis. At day 7–14, the bundle bone lining is removed.[27] By day 14, the bone is more mature. The removal of bundle bone has significant implications for implant stability.[23] Bundle bone resorption causes a loss of height and width of buccal bone. Over 12 months, its been shown that 50% of the horizontal dimension of the ridge disappears. Within the first 3 months, two-thirds of that total reduction has already taken place.[24]

**Biomaterials for Socket Grafting**[29]

The choice of bone grafting material should assure the long-term stability of the bone volume and should be based on solid documentation in literature. There are currently not enough data available to indicate the superiority of one method or material over another.[30] The entire regeneration of dehiscence and fenestration-type defects cannot be predictably accomplished notwithstanding that grafting protocol is enforced.[22]
- Autograft: Bone from the same individual which predictably accelerates new bone formation. The disadvantage is unpredictable resorption and donor site morbidity and resorptive tendency changes with harvesting technique.[31]
- Allograft: Bone from same species but another individual. These include free frozen bone, freeze-dried bone allograft, demineralized freeze-dried bone allograft, and deproteinized bone allograft. This is an osteoconductive material. Disease transmission has been reported in the past.[32]
- Xenograft: Material of biologic origin but another species such as animal, corals, or calcifying algae. No reports of disease transmission. Surface characteristics of xenografts are dependent on the preparation method. This is an osteoconductive material as all proteins are removed, so there is no osteoinductive potential of xenograft materials.[33]
- Alloplast: Material from artificial origin such as Ca phosphates, glass ceramics, and polymers. The most important challenge for alloplastic materials has been reproducing the surface characteristics of biologically derived materials. The degradation, however, may be modified according to our clinical indications by changing the material’s chemical structure.[34]

**Tetracycline**

The rather impressive percentage of extraction sites undergoing clot loss and deranged healing results in significant morbidity for the patient and frequent visits to the surgeon to effect relief of discomfort, most often by the use of anodyne dressings. The amount of work lost by patients needing such palliative treatment, and loss of productive time for the surgeon, translate into an unknown, but potentially large, economic loss to society. This would mandate that economical methods of ensuring normal extraction socket healing with minimal morbidity be developed. Antibiotics are frequently used in dental practice. Clinical and bacteriological epidemiological factors determine
the indications of antibiotics in dentistry. Antibiotics are utilized in addition to applicable treatment to assist the host defenses within the elimination of remaining bacterium. It is indicated when there is evidence of clinical sign involvement and spread of infection. The most helpful socket medicaments to stop socket healing derangements would come with broad-spectrum antibiotics, specifically clindamycin, and tetracycline. Tetracycline is a broad-spectrum antibiotic used in the treatment of dental bacterial infections. Tetracycline contains a natural tendency to concentrate inside the gingival fluids around the teeth, therefore, its sometimes accustomed treatment disease. Tetracycline can be used successfully in infected tooth socket at immediate implant placement. This application will increase the potency of immediate implantation in the infected alveolus and reduce potential complication. The rather impressive percentage of extraction sites undergoing clot loss and deranged healing results in significant morbidity for the patient and frequent visits to the surgeon to effect relief of discomfort, most often by the use of anodyne dressings. The amount of work lost by patients needing such palliative treatment and loss of productive This would mandate that economic strategies of making certain normal extraction socket healing with negligible morbidity be developed. The most useful socket medicaments to prevent socket healing derangements would include broad-spectrum antibiotics, specifically clindamycin and tetracycline. However, utmost likely related to the topic of clot stabilization and remedial is assumed of resorbable substances similar gelatin sponge, polyactic acid, and methylcellulose as a clot-stabilizing socket. The mixture of those cheap materials with topical socket medicaments will prevent clot lysis and greater mechanical strength to bulk the blood clot, and this has been demonstrated with difficult mandibular third molar impactions in one study involving polyactic acid, tetracycline, and hydrocortisone. Tetracycline prevents dry socket once placed directly into the extraction socket, immediately after surgery. One study showed that placement of tetracycline in an exceeding suspension with a couple of drops of saline combined with a sq. of Gelfoam considerably scale back the incidence of the dry socket when used as a dressing after impacted mandibular third molar teeth extraction.

**Clindamycin**

Erythromycin and clindamycin are presently counseled for antibiotic prevention of infective carditis in susceptible patients allergic to antibiotic undergoing oral invasive procedures. 38 healthy patients were irregular to receive either Erythromycin (1 g) or clindamycin (0.6 g) orally 1.5 h before dental extraction. Blood samples for microbiological investigation were collected before, during and 10 min after surgery and were processed by lysis filtration under anaerobic conditions. The incidence of bacteremia with *viridans streptococci* was 79 within the Erythromycin group and 74 within the clindamycin group. No statistically vital distinction was noted in incidence or magnitude of bacteremia with *viridans streptococci* or anaerobic bacterium between the two groups, at any sampling time, and at any sampling time. 96 aerobic and 133 anaerobic strains recovered from the blood samples were tested for his or her status to Erythromycin and clindamycin still on phenoxymethylpenicillin and SK-ampicillin. The antimicrobials were found to be highly active against the majority of bacteria except for some *enterococci, staphylococci,* and *veillonella.* Protection from endocarditis by prevention with Erythromycin or clindamycin should ensue to the elimination of bacterium at a later stage within the development of the sickness, instead of by elimination of the bacterium from blood throughout the short period of surgical bacteremia. Clindamycin is very most popular because the drug of selection in the interference of inflammation due to its anaerobic properties.

**CONCLUSION**

Having a proper medical history before surgery can enable the operating surgeon to prevent the complications which may arise. The correct diagnosis of the etiology will provide the quickest route to successful management. The surgeon should be certain about proper surgical techniques, and know their limitations prior to any extractions. If and when difficulties develop, it is always recommended to explain the situation to the patient. This review tells about the management of socket after extraction using medication.

**REFERENCES**


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