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Review Article

Alveolitis Management, Efficiency of the Different Treatment Methods Available

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Abstract

Introduction: Alveolitis is the most common complication after a tooth extraction. Blum describes alveolitis as the presence of postoperative pain in and around the extraction site, increasing in severity any time between one and three days after extraction accompanied by a partially or completely disintegrated blood clot within the alveolar cavity. When there is alveolitis, there is no presence of blood vessels, which is why the proliferation of capillaries is not allowed, and therefore, the blood clot is not organized and finally ends up disintegrating. When there is loss of the blood clot, the alveolar bone is exposed to air, food and liquids, causing pain. There are several risk factors related to this dental complication, including age, sex and hormonal therapy, surgical area, tobacco consumption, and previous infections. Currently there are several treatments that could be used to treat this type of complication, among these we have: pastes and dressings, antiseptics, anti-inflammatory analgesics, antibiotics, surgical treatments, laser therapy, hyaluronic acid, application of aloe vera and honey.

Objective: To analyze the management of dry socket and the efficiency of the different treatment methods available.

Conclusion: It is important to keep in mind that all of these treatments mentioned above present the same benefits and focus especially on reducing pain, relieving discomfort, as well as promoting the repair and healing of the alveolar mucosa.

Keywords: Alveolitis; Management; Alveolar Osteitis

Introduction

Dry socket is the most common complication after a tooth extraction. Blum describes alveolitis as the presence of postoperative pain in and around the extraction site, increasing in severity any time between one and three days after extraction accompanied by a partially or completely disintegrated blood clot within the alveolar cavity, with or without halitosis [1,2].

Hupp divides it into 2 entities, primary dry socket, which corresponds to a periostitis of the naked socket. Patients do not bleed after extraction; It is immediate and secondary dry socket, this is mediate, occurring between the second and fourth day after the extraction, there is total loss of the clot, the patient presents a bad taste, intense and radiating pain with lymphadenopathy and slightly marked halitosis [1,3].

There are several risk factors related to this dental complication, including age, sex and hormonal therapy, surgical area, tobacco consumption, and previous infections [4].

There are currently no exact guidelines on how to manage dry socket, however, there are several drugs, dressings and even biomaterials that can be used to solve this dental complication.

Most of this treatments or managements could be paste and dressings like iodoformed gauze coated with zinc oxide and eugenol, GECBB, antiseptics, anti- inflammatory analgesics, antibiotics, surgical managements, laser therapy, honey, hyaluronic acid, aloe vera; which will be described in this article.

Alternative managements and treatments

Paste and dressings

Dressings have been the most used treatment for dry socket. A great example is iodoformed gauze coated with zinc oxide plus eugenol. There are already other preparations on the market based on eugenol combined with glycerin, lanolin, olive oil, etc. [5]. Eugenol serves as an analgesic and disinfectant. However, it is also associated with chronic inflammation, delayed wound healing, and risk of inducing an allergic reaction [4]. It has also been reported that mixing zinc oxide with eugenol could cause osteonecrosis [6].

Alveogyl (iodoform with butylparaminobenzoate) has reported excellent results in combating painful symptoms. Its components depress the sensory receptors involved in pain perception by inhibiting the synthesis of prostaglandins. On the other hand, iodoform is considered antiseptic [2]. In some studies it has been shown that laser therapy could provide better pain relief compared to alveogyl, but it is still a good option for the management of this complication [4].

Among the new treatment options through the use of dressings in the dental socket, the collagen sponge soaked with plasma rich in growth factors (CFRP), obtained from autologous blood, has shown good results in the management of dry socket. It is presumed that growth factors could accelerate the healing process and angiogenesis, reducing pain. It has been shown that growth factors improve painful symptoms in patients, especially after the second day after extraction, this being an excellent method to prevent and treat dry socket [7].

The use of the GECBB pill based on guaicol, eugenol, chlorobutanol and balsam of Peru has shown excellent results in pain relief [7].

This is a paste inserted into a tablet of gelatin, glycerin and sugar placed in the alveolus as a dressing that also does not need to be prepared before use [1]. In several studies it is estimated that the G.E.C.B. has a faster effect (pain remission in 19.87 minutes after GECB pill instead of 45.53 minutes after zinc oxide eugenol) [8].

Studies have also been carried out where the patient is administered a dose of 4000 mg of vitamin C along with curettage and irrigation, achieving 100% pain remission in just 4 days [4].

It is important to remember that all dressings act as a physical barrier to keep the socket sealed, preventing the exposure of the bone nerve endings to the environment, although in some cases they can react as a foreign body, delaying the healing period [5].

Antiseptics

Chlorhexidine is an antiseptic that can be used as a local irrigant and/or mouthwash at 0.12 and 2% with ample evidence of its effectiveness. Its use as a rinse has been standardized every twelve hours. It is also usually used topically as a 0.2% gel inside the socket every twelve hours for 7 days. This form of presentation has the advantage of the possibility of use within 24 hours after extraction [9].

The combination of antiseptics capable of releasing large amounts of oxygen is also recommended, since they show effectiveness against anaerobic bacteria. Among these combinations is sodium iodide with 3% hydrogen peroxide. When in contact with the tissues, the released oxygen acts as a germicidal agent. The effervescent mechanism encourages wound cleaning and removal of debris [2].

Anti-inflammatory analgesics

Its prescription is necessary and appropriate, since the main thing is to reduce pain. Authors suggest from the use of NSAIDs to paracetamol preparations with codeine. The use of ketorolac 30 mg IM followed by an oral dose of 10 mg every 6 hours is recommended depending on pain[5]. Other studies also recommend the use of oral celexocib 200 mg [10].

Antibiotics

Although it is believed that its use could prevent the appearance of infections and dry socket, various authors report that the use of antibiotics as prophylactics is not necessary [11].

Surgical

Within these protocols are curettage and irrigation with physiological saline to other more invasive procedures. Aggressive curettage is not recommended by some authors, as it can cause great alveolar trauma and induce possible bacteremia. Other maneuvers include prior regularization of the edges of the socket and the use of flaps to cover the exposed socket [3].

Laser therapy

Laser therapy stimulates cellular metabolism, microcirculation and produces an analgesic, anti-edematous and anti-inflammatory effect. This has shown beneficial results in accelerating the wound healing process in diabetic patients [12].

Recent studies have confirmed that low-power gallium arsenide diode laser therapy has been beneficial in accelerating bone healing in rats and decontaminating dental implants [4].

Kaya., *et al*. carried out a randomized clinical trial with the objective of comparing the effectiveness of Alvogyl, SaliCept and low-level laser therapy (LLLT) in reducing pain in dry socket. They concluded that LLLT worked superior to SaliCept and alvogyl and achieved pain remission [13]. On the third day, pain intensity decreased more rapidly in the three treatment groups than in the control group treated with curettage and irrigation alone [2].

Honey

Broad therapeutic actions are attributed to honey. In a study under relative isolation, a superficial exploration of the alveolus was performed, washed with distilled water, dried with sterile gauze and with an applicator the honey was taken to the alveolus, then covered with a sterile gauze swab and waited one hour to measure the intensity of the pain again, collecting the data in a survey prepared for this purpose for each patient. The patient was instructed not to ingest liquids or food for one hour, to maintain good oral hygiene, and to return within 24 hours for progress. The progress visits and honey treatment were repeated at 24, 48 and 72 hours [14].

As time and local applications of honey increased, intense and moderate pain decreased, and of course patients with mild pain and no pain increased. This happens due to the analgesic and sedative effect of honey, in addition to being a great antiseptic. and antibiotic, properties that are fundamentally conferred by inhibin, capable of stopping the development of bacteria and formic acid, a perfect substance against putrefaction, which is why honey turns out to be an effective therapy of choice in alveolitis regardless of the intensity of the pain and type of alveolitis. Most patients were evaluated as favorable at 72 hours. It was found that the use of honey in dry sockets is a safe therapy for the patient because no adverse reactions occurred during the study, which may be due to its antitoxic effect [14].

Hyaluronic acid

Treatment with hyaluronic acid consists of controlling pain and stimulating the healing process. The pharmacological device tested in this study was designed to act comparatively in relieving pain and promoting healing [15].

Hyaluronic acid is a non-sulfated glycosaminoglycan polymer, composed of disaccharide units. Long chains of hyaluronic acid are the main components of synovial fluid, skin, mucous membranes, cartilage and extracellular matrix, and ensure tissue elasticity, support cell proliferation and migration, and serve as a lubricant. In tissue damaged by trauma and infection, long chains of hyaluronic acid are degraded and the resulting low molecular weight chains induce an inflammation response, cell migration and angiogenesis. To a large extent, hyaluronic acid synthesis increases during the first stage of healing, due to the effect of IL-8, TNF- and the presence of bacterial polysaccharides. This leads mainly to the activation of CD44-positive lymphocytes, and secondarily, to the induction of an inflammatory response. After the formation of granulation tissue, the role of hyaluronic acid changes as it begins to absorb free radicals and therefore reduces oxidative stress in the new tissue [16].

A pharmacological device similar to a sponge is used, it is a lyophilized water solution of 2.5% hyaluronic acid, ODC and calcium chloride. The entire device weighs 35 mg, including 0.06 mg of ODC. Most patients described pain relief directly after administration, although this device does not contain any anesthetic. After 6 p.m. the pain worsened again but never reached the previous level. The tested product did not remain inside the extraction wound for more than 24 hours. According to the patients' description, this device completely dissolved after approximately 16-20 h. Of a total of 50 study subjects who completed the study, 48 have reported that their pain perception decreased below 20 mm VAS, within 7 or fewer administration days of treatment. Testing of the pharmacological device represented a success rate of 96% [15].

Aloe vera

Aloe vera is a herbal plant that is used in a variety of medical conditions, such as wound healing and reducing tissue damage. Aloe vera is a bushy, xerophytic, green plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. It is a vital nutrient that has vitamins A (beta-carotene), C and E, which are antioxidants, calcium, copper, magnesium, potassium and zinc that are essential for the proper functioning of various enzyme systems in different metabolic and other pathways [17].

In one study, almost 500 mg of Aloe vera powder capsule was mixed with 2 ml of saline solution and then soaked with gelatin foam placed in the socket on the day of extraction, then the patients were asked to come to the third and seventh day to track. Healing and pain were then assessed with respect to the atraumatic extraction sockets and measured taking into account the first day after two hours of extraction followed by the third day, the seventh day using a numerical pain rating scale [17].

The study showed 70% healing on the third day and 90% healing on the seventh day [18]. This healing potential in the Aloe vera group can be attributed to three main factors, such as the reduction

of pain and inflammation, stimulation of fibroblasts to functionally produce collagen and proteoglycans and greater tensile strength of the wound. Therefore, it is evident that Aloe plays a role in pain and inflammation [19].

Conclusion

After studying each of the different possible alternatives to manage this dental complication (alveolitis), it has been concluded that there is a wide variety of treatments that we can use to manage alveolitis, with the possibility of choosing the management that is best. Best suited to our comforts and those of the patient, taking into account several factors such as: the level of pain, severity of the infection or even the economic possibilities that the patient has. According to the reasoning that has been carried out, it is evident that all of these treatments mentioned above present the same benefits and focus especially on reducing pain, relieving discomfort, as well as promoting the repair and healing of the alveolar mucosa.

Conflict of Interest

Declare if any financial interest or any conflict of interest exists.

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