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Does excessive saline irrigation causes dry socket? A surgeon`s dilemma

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Abstract

Aim of the study: This study was carried out to evaluate the association between Dry Socket & Excessive Saline Irrigation.

Material and Methods: A total of 500 teeth were extracted from patients attending the department of oral and maxillofacial surgery due to various reasons. Patients received chemo or radiotherapy, syndromic patients and pregnant women were excluded from the study. Age, gender, medical history, location of tooth, difficulty of extraction and the presence of smoking habit were reported. After the extraction, the extraction sockets were irrigated with 20cc of normal saline. All patients were followed up after extraction for one week and instructed to visit the department when they develop any signs or symptoms of discomfort related to the extraction site. Patients who developed alveolar osteitis were diagnosed according to the conventional sign and symptoms of dry socket and managed in the standard way.

Results: The total number of dry socket reported in this current study was 4 (0.8%) cases, 3 of the cases were females and one case of dry socket was reported in male. All these cases were related to extractions in the mandible.

Conclusion: Excessive post extraction socket irrigation with saline is not related to the development of dry socket.

Keywords: Dry socket, Saline irrigation, Extraction

Introduction

Alveolar osteitis or Dry socket is a postoperative complication after tooth extraction which often impedes the healing process [1, 2]. Blum defined alveolar osteitis as "postoperative pain inside and around extraction site which increases in severity at any time between the first and third day post extraction followed by a partial or total disintegrated blood clot within the alveolar socket with or without halitosis" [3]. The first description of dry socket was given by Crawford in 1896 [4]. The term dry socket was used because the socket had a dry appearance after the clot and debris was washed away. Subsequently various terminologies like alveolar osteitis, alveolitis sicca dolorosa, septic sockets and necrotic socket has been proposed [5, 6].

The incidence of dry socket ranges from 0.5-5% for all routine extractions, can reach up to 38% on extraction of impacted mandibular third molars [7]. The incidence of dry socket is higher in the mandible, occurring up to ten times more often for mandibular molars compared with maxillary molars. Alveolar osteitis generally arises between one and three days post extraction and the duration usually ranges from 5 to 10 days [8]. Dry socket may affect women in ratio of 5:1 with respect to males. It is also found that there is a two to three fold increase in incidence of Alveolar osteitis in females compared to males [9, 10, 11].

Several factors have been reported in the literature regarding the pathogenesis of alveolar osteitis, yet the exact mechanisms are not yet confirmed. Birn's classic series of articles between 1963 and 1977 provided a better understanding of the likely pathophysiology [12, 13, 14]. Birn suggested that the etiology of Alveolar Osteitis is an increased local fibrinolysis leading to disintegration of the clot. The fibrinolysis is the result of plasminogen pathway activation, which can be accomplished via direct (physiologic) or indirect (non physiologic) activator substances [12]. Direct activators are released after trauma to the alveolar bone cells. Indirect activators are elaborated by bacteria. The fibrinolytic activity is local because initial absorption of plasminogen into the clot limits the activity of plasmin. In fact, it was found that active plasmin is inactivated in the general circulation by antiplasmins [15]. Birn and others have

further reviewed the local differences in the fibrinolytic activity between body tissue and found higher fibrinolytic activity with bone and uterine tissues, in comparison to skeletal muscle, kidney, heart, brain, liver, spleen, lung, and thyroid tissues [16, 17], but the factors capable of triggering fibrinolysis are more ambiguous.

In a thorough review conducted by Kolokythas and coworkers 2010 many risk factors were mentioned such as difficulty of Surgery, lack of Operator Experience, location of the extracted tooth as mandibular third molars, systemic disease, Oral Contraceptives, patient's Gender, smoking, physical dislodgement of the clot, bacterial infection, excessive irrigation or curettage of alveolus, age of the Patient, single extraction versus multiple extractions and local anesthetic with vasoconstrictor [18]. The relation of dry socket and excessive saline irrigation after teeth extraction is not clear in the literature [19, 20].

The aim of this study was to explore the effect of saline irrigation after teeth extraction on the development of dry socket.

Materials and Methods

A total of 500 teeth were extracted in the department of oral and maxillofacial surgery for different reasons, after the extraction procedure the sockets were irrigated with a 20 cc of saline in a disposable syringe. All patients were consented before treatment where a brief discussion done and a choice given to them to participate in the study. Patients were given regular post-operative instructions as they were advised precisely to have gentle irrigation after twenty four hours of extraction with a cup of water and quarter spoon of salt twice daily. On the next three days they were advised to do a gentle irrigation 3-4 times a day. A follow-up appointment was given after one week for each patient.

The criteria for diagnosing the presence of dry socket are illustrated in Table 1. If any sign of dry socket appears before the review visit, patients were instructed to contact the department for further management.

Table 1: The criteria for diagnosing the presence of dry socket are illustrated

Criteria 1	Presence of mild to severe pain
Criteria 2	Presence of halitosis.
Criteria 3	Presence of inflamed red gingiva area.
Criteria 4	Presence of bear bone with empty socket
Criteria 5	Presence of radiating pain to the ear and temporal area
Criteria 6	Presence of ipsilateral lymphadenopathy.

Patients who developed alveolar osteitis were seen in the department and diagnosed according to the criteria mentioned in Table 1. The onset of developing the symptoms and the severity of pain were reported.

Results

A total of 500 teeth extractions were done in the study for patients whose age ranged from 20 to 50 years. Out of the 500 cases 278 (55.6%) were female and 222 (44.4%) male. The total numbers of dry socket reported in this clinical study were four (0.8%) cases (Table 2). One case was reported in the age group of 21-30, two cases were in the age group of 31-40, one case in the age group of 41-50 (Table 3). Of all dry socket cases reported in the current study, three were in females (0.6%) and one in male (0.2%) (Table 4)

Table 2: The total numbers of dry socket reported in this clinical study were four (0.8%) cases

Saline Irrigation(n =500)	Dry Socket
04	Present
496	Absent
500	Total

Table 3: (Dry Socket & Age Group)

Dry Socket	Age (years)			Total
	21-30	31-40	41-50	
Present	01	02	01	04
Absent	88	111	297	496
Total	89	113	298	500

Table 4: (Dry Socket & Gender)

Dry Socket	Gender		Total
	Male	Female	
Present	01	03	04
Absent	221	275	496
Total	222	278	500

All dry sockets were seen in healthy patients. The four cases of dry socket were reported in the mandibular teeth mainly the first and second molars. None was reported in the maxilla. All cases of dry socket were reported by the second to third day of post extraction, there was no dry socket developed in the quadrant where multiple extractions took place.

Discussion

The aim of this study was to evaluate the relation of thorough socket irrigation with saline after teeth extraction on the development of dry socket. In the literature, no documented evidence was found to correlate the effect of excessive saline socket irrigation (saline irrigation established by the operator) and the development of dry socket. Although it was shown that excessive mouthwash will result in wash out of the clot from the extracted socket, there is no clear evidence to support its relation to the development of dry socket [21, 12, 22]. In the current study, all 500 patients received excessive saline socket irrigation after teeth extraction, only four developed dry socket, therefore the use of through socket irrigation with saline after teeth extraction has no positive relation with increase in risk of developing alveolar osteitis (Table 2). The percentage of dry socket in the current study was reported to be 0.8%, which is in consistent with other studies [18]. Field and coworkers 1985, MacGregor 1968, reported an incidence of dry socket of 0.5% - 5%. While it was 1% to 37.5% after extraction of mandibular third molars in some other studies [1]. Momeni and co workers in 2011 reported only 0.6% of dry socket in their study; they explain their lower percentage by the difference in racial and geographical factors [22]. Some studies were able to correlate age and increase in the incidence of alveolar osteitis [22]. In the current study, most of the cases occurred in patients between 31-40 years of age (Table 3). Dry socket in the current study was reported as three cases in female patients (0.6%) and only one case in male (0.2%), (Table 4). This is in consistent with many studies where more dry socket was seen in females compared to males [2, 9, 10, 11]. The medical condition of the patients had no influence on the development of dry socket in the current study as four cases were reported in healthy patients. This is in consistent with Abu Younis and Abu Hantash 2011; while it contrasts the findings of other studies [6, 12].

All dry socket cases in the current study were seen in mandibular teeth mainly in molars. No cases were reported in maxilla. This is similar to the study of Momeni and coworkers 2011, where the incidence of dry socket in mandible was more than maxilla (0.07 versus 0.05) but it was not statistically significant [22]. Other studies reported a high incidence of dry socket in relation to the third molar area [3].

In the current study, the correlation between the difficulty of extraction and the increase in the incidence of dry socket was not assessed; hence we could not differentiate between the difficult extraction, simple extraction and their impact on development of dry socket. Birn 1973 explained the increase of dry socket in difficult extractions by the activation of activators secondary to bone inflammations which result in lysis of the clot [12]. In the study of Abo Younis & Abu Hantash 2011, alveolar osteitis incidence following non-surgical extraction of teeth was 1.7% while following surgical extraction was 12% [18].

In the current study, only 40 out of 500 cases were smokers but none of them reported having post extraction dry socket. Smoking showed no prevalence in the incidence of dry socket in the current study. This is in consistent with the study of Johnson and Blanton 1988 [19]. While it is inconsistent with many studies [13, 22]. Sweet and Butler in 1979 evaluated the incidence of dry socket and smoking among 4000 surgically removed mandibular third molars. They reported that patients who smoked half-pack of cigarettes a day had an increase in the incidence of dry socket 12% versus 2.6% when compared to nonsmokers while it increased to more than 20% among patients who smoked a pack per day and 40% among patients who smoked on the day of surgery [18].

Conclusion

Dry socket is a reported problem in the literature where many factors such as age, gender, site of extraction, the difficulty of extraction, medical condition and smoking have been investigated. In the current study, excessive socket irrigation with saline of the extracted socket has no positive relation to the increased incidence of dry socket. However further elaborative study has to be carried out to justify the impact of saline irrigation and development of dry socket.

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