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The effect of Attachable intra oral wound dressing tape on post extraction dental socket

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Abstract

Introduction: One of the most discussed topics in dental research are post dental extraction bleeding and socket healing. There is limited previous studies showing the action of Attachable oral wound dressing tape on controlling the post dental extraction socket bleeding and Enhancement of the rate at which tissue in the socket heals after a tooth extraction.

Materials and Methods: This study was a prospective, randomized, controlled, and single-blind clinical trial conducted in Baghdad over a 2-month period, from June 3, 2023, to August 1, 2023. The procedure involved the extraction of the first molar, which was conveniently sampled. The sockets were randomly allocated into two groups: the study group, which had sockets covered with Attachable oral wound dressing tape, and the control group, which had sockets covered with surgical gauze. The patients had examination 2 hours after dental extraction to evaluate post-operative bleeding, and again 4 days later to check the repair of the dental socket following extraction.

Results: This study included 58 (31 females and 27 male) patients with an age > 15 years old. Post extraction dental bleeding was significantly better at the study group after 2 hour ($P=0.001$). Also there is statistically significant difference in the decrease of alveolar osteitis incidence in study group after 4 days ($p = 0.000$).

Conclusion: Ora helps to safeguard the blood clot in the sockets after dental extraction and promotes the proper healing of the extraction sites. Additional research conducted at more suitable intervals is important to yield dependable results.

Keywords: ORA-AID, post extraction bleeding, alveolar osteitis

Introduction

The process of extraction unintentionally causes harm to nearby blood vessels around the tooth, resulting in the filling of the socket with blood. In addition, the regular clotting mechanisms of the intrinsic and extrinsic clotting pathways, which are part of the coagulation cascade, result in the formation of a loose clot that fills the socket.

Following a tooth extraction, it is typical for the extraction site to experience bleeding. Patients should be aware that it is common for the area to release a small amount of fluid for up to 24 hours following the treatment. Post-extraction bleeding (PEB) refers to the abnormal condition where bleeding persists without the development of blood clots or extends beyond a duration of 8 to 12 hours. Patients experiencing such bleeding occurrences may require immediate dental consultations and procedures, which can be distressing. The reasons of post-extraction bleeding (PEB) can originate from a specific area, result from a systemic condition, be triggered by medication, or occur due to the patient's failure to follow post-extraction recommendations. In order to manage this bleeding, many local and systemic approaches have been employed, relying on the proficiency of the clinician^[14].

To limit bleeding after surgery, the first step is to lay a folded gauze directly over the socket. Large packs that include the occlusal surfaces of teeth neighboring the extraction site do not exert pressure on the bleeding socket and so lack effectiveness. Moistening the gauze prevents the seeping blood from clotting and potentially dislodging the clot when the gauze is removed. This can lead to alveolar osteitis and delay healing of the tooth sockets after extraction. The product of 3 and 5.

Advancements in the management of extraction socket healing have been made through the introduction of non-resorbable membrane barriers. These barriers can be employed on their own or in conjunction with particle materials that are suitable for the size of the dental socket.

The attachable oral wound dressing tape is a novel method of securing an intraoral patch to safeguard areas affected by procedures such as tooth extraction, implant surgery, orthodontics, and ulcers. It consists of a hydrophilic polymer complex and a mucoadhesive layer. The mucoadhesive layer interacts with the moisture in the oral mucosa, transforming into a gel-like state and partially expanding. This process aids in maintaining the moisture level of the wound by absorbing exudate and minor bleeding. The attachable oral wound dressing tab is extremely pliable, securely adhering to the surface of the oral wound, and causes a minimal sensation of a foreign object. Mucoadhesion persists until the hydrophilic polymer dissolves, after which the outer layer is naturally removed from the mucosa within approximately 6-8 hours later [6, 10, 12, 16, 20].

Methods

The study was conducted as a prospective, randomized, controlled, and single-blind clinical trial in the Department of Oral and Maxillofacial Surgery at Al-Maghrib specialized dental health center in Al Rusafa, Baghdad, Iraq. The study took place over a period of 2 months, from 3 June 2023 to 1 August 2023.

The study proposal for the year 2023 has been accepted by the research ethics committee of the Iraqi Ministry of Health. The approval includes a unique registration number and adherence to the instructions outlined in the Declaration of Helsinki.

A sample size was chosen for its convenience after performance the Clinical examination by the specialist in oral medicine in the diagnosis department, extraction difficulty assessment by oral surgeon was done at oral surgery department for every patient who had first permanent molar teeth extraction To identify suitable participants for the study. Prior to commencing the implementation of this investigation, the operators underwent specialized training. in order to position the attachable oral wound dressing tape precisely on the fresh dental socket, assess the difference between dental socket oozing and bleeding after 2 hour, and the incidence of alveolar osteitis after 4 days.

The patients were randomly assigned to each group, according to a random numbers table collected at <http://random.org/sform.html>. By an operator who was not actively engaged in the evaluation of the results.

The necessary information regarding the patient's medical and dental history, as well as other individual data, was obtained through a face-to-face interview with each patient. Appendix I Extraction of 1st molars for each patient was made under local anesthesia (lidocaine with adrenaline 1:80000, Huons Co. Ltd., Korea) Appendix II. The patients were divided randomly into study group in it dental sockets were covered by attachable oral wound dressing tape (ora aids) and control group in it dental sockets were covered with intraoral sterilized gauze pack.

During patient selection, particular care was taken to ensure that the groups were similar with respect to age and sex. In

order to eliminate the possible effects of personal variables on the outcome of study.

A signed statement of informed consent was obtained from each patient before to their participation in the trial. Parents/caregivers provided their approval for patients who were below the age of 18 by signing the informed consent declaration.

Appendix III

Inclusion criteria

1. Patient without any history of bleeding disorders.
2. Patient without any history of uncontrolled disease.
3. Person without any history of allergy to dental anesthesia.
4. Patient with first molar permanent tooth indicated for atraumatic dental extraction.

Exclusion criteria

1. Patient with history of bleeding disorders.
2. Patient with history of uncontrolled disease.
3. Patient with history of allergy to dental anesthesia.
4. Patient with periapical lesion or traumatic dental extraction.

Follow up

All patient in this study was assessed

1. After 2 hour for post dental extraction bleeding, the grade 0 (very low), grade 1 (low), grade 2 (normal), grade 3 (high), and grade 4 (very high) (7) (Thuruthel *et al.*, 2023, Mahmoudi *et al.*, 2023).
2. After 4 days to assess the post extraction dental socket healing (alveolar osteitis) as present or not.

Result

A total of 58 teeth in 58 patients were enrolled in this study, After exclusion the patient that switch to surgical or traumatic extraction and the patients not came to follow up appointment. The patients included 31 with (49.2%) percent females, and 27 with (42.9%) percent males and a mean age of 30 years (range, 15-65). Most teeth were located in the mandible (74.6%, n= 47) and (17.5%, n =11) in maxilla.

The demographic distribution regarding the age, sex, and jaw at a Mean \pm SD (30.30 \pm 11.210) was illustrated in Tables (1), extracted teeth was shown in pie chart (1).

Table 1: Demographic Characteristic

| Age | Frequency | Percent |
|----------|-----------|---------|
| 15-24 | 21 | 36.2 |
| 25-34 | 22 | 37.9 |
| 35-44 | 11 | 19.0 |
| >44 | 4 | 6.9 |
| total | 58 | 100.0 |
| Sex | Frequency | Percent |
| Female | 31 | 49.2 |
| Male | 27 | 42.9 |
| Total | 58 | 100.0 |
| Jaw | Frequency | Percent |
| Maxilla | 11 | 17.5 |
| Mandible | 47 | 74.6 |
| Total | 58 | 100.0 |

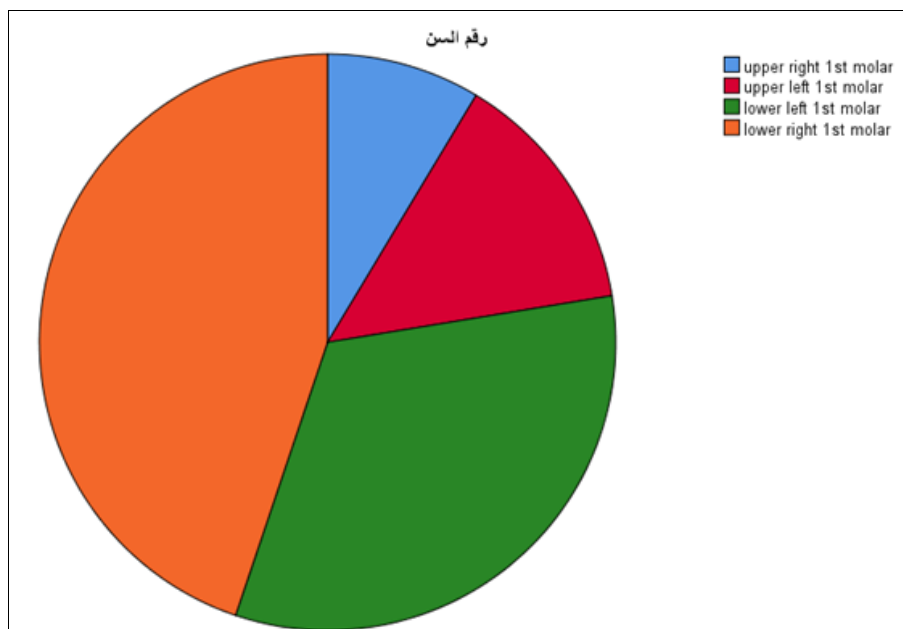


Chart 1: Shows the Extracted teeth

Based on postoperative assessments, the data show great percent (65.5%, n= 19) of normal bleeding grade (according to the Thuruthel *et al.*, 2023, Mahmoudi *et al.*, 2023 scale) in a control group with great percent (62.1%, n= 18) of low bleeding grade (according to the Thuruthel *et al.*, 2023, Mahmoudi *et al.*, 2023 scale) in a study group with a p value of 0.001 so result showed statistically significant difference in the study group when compared with the control group regarding the post dental extraction bleeding as illustrated in table (2).

Table 2: Shows the post dental extraction bleeding

| Bleeding | Very low N(%) | Low N(%) | Normal N(%) | High N(%) | Very high N(%) | P value |
|---------------|------------------|-------------|----------------|--------------|-------------------|---------|
| Study group | 0(0%) | 18(62.1) | 9(31.0) | 2(6.9) | 0(0%) | 0.001 |
| Control group | 0(0%) | 6(20.7) | 19(65.5) | 4(13.8) | 0(0%) | |

Regarding the incidence of alveolar osteitis after 4 days post dental extraction, the result show 5 cases of alveolar osteitis in control group with (17.2%) percent, and 2 cases of alveolar osteitis in study group (6.9%) with a statistically significant difference in the decrease of alveolar osteitis incidence in study group with a p value = 0.000 as illustrated in table (3).

Table 3: Shows the Alveolar osteitis

| Alveolar osteitis | N (%) | P value |
|-------------------|---------|---------|
| Study group | 2(6.9) | 0.000 |
| Control group | 5(17.2) | |

Discussion

The healing of an extraction socket is a specialized example of healing by secondary intention. Immediately after the removal of the tooth from the socket, blood fills the extraction site and the Organization of the clot begins within the first 24 to 48 hours [13]. It is crucial for dental socket healing to maintain the clot inside the dental socket by controlling the post extraction bleeding or by prevention the dislodgment of the clot from the dental sockets [13]

In recent years various topical treatments, such as adhesive tapes, gels, and films, have been developed to protect, maintain and enhance the oral wound healing [7, 11].

ORA-AID is a new concept of attaching an intraoral patch or

tape to protect the affected area such as post extraction, implant surgery, orthodontics and ulcers [6].

ORA-AID is composed of 2 layers: an oral mucosa adhesive side and a protection side. When exposed to moisture, the water-soluble adhesive side changes into a gel state to achieve adhesion to the wound area for approximately 6 hours. The protection side consists of a non-resorbable polymer which covers the wound to protect it from the environment in the oral cavity. It is Protects intraoral wounds from food, bacteria, and cigarette smoke, Aids in hemostasis, besides it is Easy to cut and shape and Strong adhesive using hydrophilic polymer [16].

The current study assessed the impact of the ORA-AID film on the treatment of post-extraction dental sockets, specifically in relation to post-extraction bleeding and the development of alveolar osteitis. The study hypothesized that the ORA-AID film, by acting as a protective barrier at the wound site, would prevent the mechanical displacement of the blood clot and subsequent bleeding, thereby hindering the wound healing process.

The study findings indicate a notable disparity in bleeding assessment two hours after extraction, with a significance level of 0.5 and a p-value of 0.001. This may be attributed to the stability of the outer wound dressing (OWD) and the transformation of the inner layer into a gel-like substance that absorbs small bleeding in the wound. Furthermore, this gel-like substance remains unaffected by tongue movement or changes in the amount of pressure applied by the patient on the oral gauze pack. These findings align with the conclusions of 한슬민, *et al.* in their study titled "A clinical study on the effect of attachable periodontal wound dressing on postoperative pain and healing." The Curatick® "ora aid" treatment was discovered to be beneficial in reducing post-operative pain, bleeding, and dietary discomfort following periodontal flap surgery [6, 7, 21].

The study found a statistically significant difference in wound healing and dry socket formation between the study group and the control group. This difference may be attributed to the mucoadhesion, which is a result of various mechanisms including the conversion of the inner layer of ora aid into a body glue. This mucoadhesion helps in promoting the proper healing of the dental socket. This aligns with the findings of

Makvandi, Pooyan, *et al.*, who demonstrated that the OWD film's effective mucoadhesion has significant promise in minimizing wound infections and enhancing tissue repair^[8].

Conclusion

Ora-aid is a dental product that can be used after a dental procedure to safeguard the blood clot in the dental socket and prevent it from being dislodged within the initial 5-6 hours following the tooth extraction. Furthermore, patients will have significant enhancement in their comfort, less postoperative pain and bleeding, safeguarding of intraoral wounds against food, bacteria, and cigarette smoke, and facilitation of recovery following oral surgery and treatment. No significant problems or morbidity were observed in this study regarding the use of ora-aids, except for difficulties in adhering to the prescribed regimen, which were found to be connected with the educational level of the patients.

Conflict of Interest

Not available

Financial Support

Not available

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