

# Efficacy of Aloe Vera Gel in Dry Socket After Removal of Mandibular Third Molar

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## ABSTRACT

**Objective:** To evaluate the effectiveness of Aloe Vera gel in management of dry socket after surgical removal of 3<sup>rd</sup> molar.

**Study Design & Setting:** From December 2020 to November 2021, a descriptive research was conducted in the Section of Oral & Maxillofacial Surgery, Liaquat University of Medical & Health Sciences, Jamshoro, Hyderabad, Sindh.

**Methodology:** Total 70 patients were included and divided equally in two groups i.e. Group-A (Alveora dressing) and Group-B (Controls). Dry socket, pre-operative assessment was carried out on the basis of pain Visual analog scale (VAS) and healing index. Socket was irrigated with sterile saline 0.9% in experimental group. In control group, patient were given tablet Panadol 1gm SOS. Patients were evaluated post operatively at 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> day on the basis of pain (VAS) and healing index.

**Results:** In group-A mean postoperative VAS at day-1, day-2 and day-3 was 6.69±2.59, 3.17±2.39 and 1.14±1.03 respectively. In group-B it was 7.77±2.03, 6.97±2.14 and 4.57±2.57. In group-A, mean postoperative healing scale at day-1, day-2 and day-3 was 2.83±0.56, 3.49±0.61 and 4.37±0.73 respectively and in group-B it was 2.31±0.58, 2.63±0.69 and 3.26±0.65 respectively. Significant association of pain intensity at day-2 and day-3 and healing index (at day-1, day-2 and day-3) was observed.

**Conclusion:** Aloe Vera gel significantly reduced postoperative pain and improve healing index.

**Keywords:** Effectiveness, Aloe Vera Gel, Dry Socket, Surgical Removal, Third Molar

## INTRODUCTION

Dry socket (Alveolar osteitis) is a bothersome condition that manifests as acute excruciating, continual pain that lasts all day and night and develops within 48 hours following tooth extraction. There are many contributing factors for dry socket i.e.; surgical trauma or difficult extraction, lack of operator experience, any systemic disease, smoking, physical dislodgment of the clot, bacterial infection, excessive irrigation or curettage of alveolus, age of patient, bone or root fragment remaining in the wound, excessive use of local anesthetic solution during extraction and use of contraceptive pills in females.<sup>1,2</sup>

Dry socket occurs 10 times more frequently in the mandible than in the maxilla, affecting 1 to 4% of extractions and up to 45 percent for the mandibular 3<sup>rd</sup> molar. Dry socket strikes females in a 5:1 ratio compared to men. 1,2 When the blood clot around the recovering tooth extraction spot is dislodged, this happens. Owing of the comparatively low blood supply to this region of the mandible, alveolar osteitis is very likely an unpleasant inflammation within the unfilled tooth socket (which explains why dry-socket is usually not experienced in other parts of the jaw). After tooth extraction, irritated alveolar bone that is left unguarded and accessible to the oral milieu might get clogged with food and particles.<sup>3,4</sup>

The issue of dry socket is self-limiting. Nonetheless, owing to the degree of the patient's discomfort, considerable remedial therapy is frequently required.<sup>5</sup> The choice of therapies for a dry socket involve: watering with a 0.12-0.2 % chlorhexidine rinse, placing of a self-eliminating dressing such as Alvogyl (containing eugenol, butamben, and iodoform), zinc oxide eugenol, lidocaine gel, systemic antibiotics, NSAID'S, clove oil alone, salt water rinse, hot cold compression, application of honey, turmeric powder, green and black teas and currently use of Aloe Vera gel.<sup>5,6,7</sup>

Innovations in holistic medicine have promoted the usage of a variety of biological items in dentistry for a variety of purposes. The uses have been implicated for handling of diverse oral diseases including periodontal disease, non-healing ulcers, extraction sockets etc.<sup>2</sup> Aloe Vera is a naturally herb substance that has a variety of advantages with no recorded adverse consequences and is garnering a lot of attention in clinical studies.<sup>8</sup>

Aloe Vera has a number of substances that can aid in the treatment of oral problems and periodontal conditions. This herb and its derivatives are well-known for boosting immunity and have been shown to be non-allergic. AloeVera has been revealed to have anti-inflammatory, antibacterial, hypoglycemic, and anti-arthritis belongings in several investigations.<sup>9,10</sup> Aloe Vera extract has been discovered to efficiently treat burns, skin irritation, edoema, and discomfort in a variety of scenarios. Mucus activation and cellular defense are also features of aloe extract.<sup>11,12</sup>

## MATERIAL AND METHODS

A Total of 70 subjects with age group 18 to 40 years irrespective of gender which have undergone third molar extraction non surgically were included in the study. Patients having systemic diseases, patients who have been treated with surgical extractions, poor oral hygiene and smokers were excluded from study.

The patients were taken from out-patient department according to inclusion criteria of study, informed and written consent was taken by patients. Complete history of patient including name, age, gender, hospital registration number, presenting complains and clinical features including sign and symptoms were recorded in study performa.

A total of 70 patients were designated into study group and control group. After diagnosis the dry socket as per history, sign and symptoms and clinical findings, pre-operative assessment was carried out on the basis of pain & healing through Visual Analogue Scale (VAS) and healing index. After then the socket was irrigated with sterile saline 0.9% (Searle Made in Pakistan).

In control group, patient were given tablet Panadol 1gram (Galaxo Smith kline Made in Pakistan) SOS. In study group, Aloe Vera gel (kinis, kroner) was applied at extraction socket of mandibular third molar. Patients were evaluated post operatively at 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> day on the basis of pain Visual Analogue Scale (VAS) and healing index.

The statistics was input, stored, and processed using the SPSS version 21 programme. The chi-square test was used to compute the frequency and percentage for categorical variables such as gender, marital status, treatment groups, start of symptoms, and pre-operative finding. For continuous variables like age, pain scale, and healing index, the mean and standard

deviation (SD) were determined. The pain scale and healing index were used to assess the efficacy of treatment groups (study and control) on days 1, 2, and 3.

Healing scale:

Healing Index	Tissue color	Response to palpation	Granulation Tissue	Incision Margin
Very poor 1	>=50% gingival red	Bleeding	Present	Not epithilized, with loss of epithelium beyond incision margin.
Poor 2	>=50% of gingival red	Bleeding	Present	Not epithilized with connective tissue exposed.
Good 3	>=25% & <50% gingival red	No Bleeding	None	No connective tissue exposed.
Very good 4	<25% of gingival red	No Bleeding	None	No connective tissue exposed.
Excellent 5	All tissues are pink	No Bleeding	None	No connective tissue exposed.

**RESULTS**

The results showed that in group A, there was 60% male and 40% female patients while in group B, there was 57.1% male and 42.9% female patients as presented in Table-1.

Table 1: Frequency Distribution Of Gender (n=70)

	Frequency (%)	
	Group A	Group B
Male	21 (60)	20 (57.1)
Female	14 (40)	15 (42.9)
TOTAL	35	35

Table 2: Descriptive Statistics Of Age (Years) (N=70)

	Group A (n=35)	Group B (n=35)
Mean	24.37	24.71
SD	5.77	5.98
Range	22	21
Minimum	18	19
Maximum	40	40

Table 3: Frequency Of Clinical Findings According To Study Group (N=70)

	Study Group		Total	P-Value
	Group A	Group A		
<b>ONSET OF SYMPTOMS AFTER EXTRACTION</b>				
24 Hours	1 (2.85)	0 (0)	1	0.631
48 Hours	16 (45.7)	14 (40)	30	
72 Hours	18 (51.4)	21 (60)	39	
TOTAL	35	35	70	
<b>FREQUENCY OF BAREBONE</b>				
Yes	25 (71.4)	23 (65.7)	48	0.607
No	10 (28.6)	12 (34.3)	22	
TOTAL	35	35	70	
<b>FREQUENCY OF HALITOSIS</b>				
Yes	21 (60)	22 (62.9)	43	0.806
No	14 (40)	13 (37.1)	27	
TOTAL	35	35	70	

Chi Square Test was applied

The mean age of patients in group A and group B was 24.37±5.77 years and 24.71±5.98 years respectively. The descriptive statistics of age are presented in Table-2.

The onset of symptoms after extraction was noted in group A as 1(2.9%) in 24 hours, 16(45.7%) in 48 hours and 18(51.4%) in 72 hours. The onset of symptoms after extraction was noted in group B as 1(2.9%) in 24 hours, 16(45.7%) in 48 hours and 18(51.4%) in 72 hours. We found insignificant association of age, pre operative pain intensity, bare bone, halitosis, onset of symptoms after extraction. Table 3

Mean comparison of age, pre and post operative VAS (at day 1, day 2 and day 3) and healing scale (at day 1, day 2 and day 3) in both study groups was done by independent t-test and presented in Table 4 & 5. The results showed significant mean difference of post operative VAS and healing scale at day 2 and day 3 with study group (p<0.001)

Table 4: Mean Comparison Of Pre-Operative And Postoperative Pain According To Study Group (N=70)

STUDY VARIABLE	GROUP A			GROUP B		
	Mean	SD	P-Value	Mean	SD	P-Value
Pre-operative Pain Scale	8.89	1.20	0.576	8.71	1.34	0.576
<b>Postoperative Pain Scale</b>						
At Day 1	6.69	2.59	<0.0001*	7.77	2.03	0.106*
At Day 2	3.17	2.39		6.97	2.14	
At Day 1	6.69	2.59	<0.0001*	7.77	2.03	<0.0001*
At Day 3	1.14	1.03		4.57	2.57	
At Day 2	3.17	2.39	<0.0001*	6.97	2.14	<0.0001*
At Day 3	1.14	1.03		4.57	2.57	

Independent t-test was applied.

Table 5: Mean Comparison Of Postoperative Healing Scale According To Study Group (N=70)

Postoperative Healing Scale	GROUP A			GROUP B		
	Mean	SD	P-Value	Mean	SD	P-Value
At Day 1	2.83	0.56	<0.0001*	2.31	0.58	0.014*
At Day 2	3.49	0.61		2.63	0.69	
At Day 1	2.83	0.56	<0.0001*	2.31	0.58	<0.0001*
At Day 3	4.37	0.73		3.26	0.65	
At Day 2	3.49	0.61	<0.0001*	2.63	0.69	<0.0001*
At Day 3	4.37	0.73		3.26	0.65	

**DISCUSSION**

In a research on post-extraction socket mending, the Aloe vera sample demonstrated 70% repair on the third day and 90% healing on the seventh day, whereas the analgesics category showed 60% healing on the third day and 76 percent healing on the seventh day. The Aloe vera group's healing capacity may be linked to three primary variables: (a) decreased soreness and swelling, (b) activation of fibroblasts to make collagen and proteoglycans, and (c) improved wound tensile toughness.<sup>13</sup>

Aloe vera polysaccharides, according to Zhan Hai et al, increased immunological response and had antioxidant properties.<sup>14</sup> According to a research executed by Kathuria et al, aloe vera is effective in a variety of oral diseases. Topical administration of Aloe vera gel to herpetic viral wounds, aphthous ulceration, and splits at the curve of the lips improves acute mouth lesions. Additionally it serves as a detoxification element and encourages cell development.<sup>14,15</sup>

The proportion of trismus in the Aleo vera sample was lower than in the standard saline category in a research, although the difference was not meaningful. This drop in trismus in the Aloe vera group can be interpreted due to reduced discomfort in the Aloe vera group. In all of the follow-up days, the Aloe vera group had a decreased frequency of dry socket than the control group, although this differentiation was not statically important.<sup>14</sup>

Mouthwash incorporating chlorhexidine on the day of procedure and for a few days after surgery can minimise the likelihood of dry socket, based to a meta-analysis by Caso et al.

The efficacy of Aloe vera mouthwash was comparable with investigations that showed a decrease in postoperative sequelae utilizing chlorhexidine and green tea mouthwash.<sup>16,17</sup>

Plant chemicals are increasingly being used as a substitute to chemical substances since they are least hazardous. Only a couple experiments, like the one by Bacci et al. in 2011, looked at the influence of a natural substance and diet (normast) on the alleviation of problems following surgery.<sup>18</sup> Although Aloe vera was not utilised in any of the research examined to reduce problems following third molar operation, other investigations, including those by Eshghi et al., looked at its analgesic and anti-inflammatory benefits.<sup>19</sup>

Eshghi et al. investigated the impact of Aloe vera cream to a placebo cream on soreness in a prospective, double-blind, placebo-controlled experiment. Individuals must have applied creams right after surgery and again 12 hours afterwards, continuing therapy three times a day for four weeks. A VAS was used to measure pain immediately after operation, as well as at hours 12, 24, and 48 after surgery, as well as at weeks 2 and 4. They eventually came to the conclusion that applying Aloe vera cream to the surgery location reduces postoperative pain throughout rest and defecation, as well as recovery process and analgesic needs in individuals, as contrasted to the control condition.<sup>19</sup>

On oral lichen planus, Mansourian et al. evaluated the curative benefits of Aloe vera mouthwash with triamcinolone acetonide 0.1 % (TA) (OLP). Subjects were split into two groups at random. Every subject was given either TA or Aloe Vera mouthwash. Both categories received therapy for four weeks. On days 8, 16, and 60, patients were assessed. The VAS was employed to assess pain and a scorching feeling, while the Thongprasom index was utilised to assess clinical progress and recovery. In the management of OLP sores, both Aloe vera and TA considerably lowered VAS score, Thongprasom score, and the diameter of the lesions, according to their findings.<sup>20</sup>

**Limitations:** Because this was a solitary hospital-based analysis with a limited sampling strength and was done in an urban setting, the findings may not be applicable to wider populations.

## CONCLUSION

We concluded that extract of aloe vera gel significantly reduces the post operative pain and provides better healing after surgical removal of mandibular third molar. With its active constituents and established safety background, aloe vera offers a wide range of applications in dentistry. Randomized, blinded trials with a larger sample size would be more convincing in recommending aloe vera as the primary therapy for extraction socket repair.

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