

## The Effect of Alvogyl™ When Used As a Post Extraction Packing.

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### ABSTRACT

**Objectives:** To study the effect of Alvogyl packing in extraction sockets on the occurrence of postoperative complications after mandibular third molar extraction. **Subjects and methods:** The study was performed on 50 patients who underwent surgical and non-surgical extraction of their mandibular third molars. Alvogyl was packed in the right socket for each patient, with the left one being the control side. **Results:** Sixteen cases (32%) of dry sockets were found in the experimental side and six cases (12%) in the control side (statistically significant difference, X<sup>2</sup> test, P = 0.016). Infection was reported more in the study side (20 cases, 40%) compared to that in the control side (5 cases, 10%) (X<sup>2</sup> test, P = 0.001). However, the mean pain score in the study side (1.52 ± 0.51) was significantly lower than that in the control side (1.90 ± 0.30) (t-test, P < 0.001). **Conclusion:** The routine use of Alvogyl following surgical and non-surgical extraction of mandibular third molars should be discouraged.

**Keywords:** Alvogyl, Dry Socket, Infection, Clinical Trial.

### INTRODUCTION

Alveolar osteitis (dry socket) is the most commonly seen complication following the extraction of permanent teeth.<sup>1</sup> The incidence rates of alveolar osteitis have been reported to range from 0.49% to 68.1%.<sup>2</sup> The patient experiences pain, loss of productivity, and the need for multiple return visits to the surgeon's office.<sup>3, 4</sup> The condition at the extraction site is characterized by exposure of the underlying bone, and moderate to severe postoperative pain two to five days after surgery. The cause of alveolar osteitis has yet to be firmly established.<sup>2</sup> Multiple factors have been implicated in its etiology including level of experience of surgeon, surgical trauma,

smoking, use of oral contraceptives, perioperative corticosteroids, reduced regional blood supply, and bacterial contamination.<sup>5-12</sup> An increased incidence of alveolar osteitis occurs in the presence of pericoronitis, periapical infection, periodontitis, gingivitis, and in patients with poor oral hygiene.<sup>13</sup> The pathogenesis appears to result from failure of formation or fibrinolysis of the blood clot within the extraction socket following conversion of plasminogen into plasmin.<sup>14</sup>

A huge number of substances have been developed and marketed as promoting quicker healing and relieving pain following dental extractions.<sup>1-4</sup> The record of such substances in preventing dry socket is mixed.<sup>4</sup> Alvogyl is a dressing agent composed of different substances including butamben, iodoform, eugenol, penguawar, olive oil, sodium lauryl sulfate, spearmint oil, purified water, and calcium carbonate.<sup>15</sup> According to the manufacturer,

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Alvogyl may be used as a post-extraction dressing following difficult or traumatic extractions.<sup>15</sup> The purpose of the present investigation was to study whether the placement of intra-alveolar Alvogyl paste prevents the development of dry sockets following the extraction of mandibular third molars.

**Subjects and Methods**

The study was conducted in the Oral and Maxillofacial Surgery division at the University of Jordan Hospital. Patients who were planned to have their mandibular third molars extracted were invited to participate in this study. Inclusion criteria included erupted and impacted teeth, patients with who were medically fit only (American Society of Anesthesiology (ASA) Class I) and with good oral hygiene. Those who were medically compromised, who needed unilateral extraction of impacted or erupted lower third molars, and those who refused to participate in the trial were excluded. Consent for this study was sought from patients and ethical approval for the study was obtained from the local ethical committee.

The extractions were performed in the day-case-unit at the division by the consultant or the residents under direct supervision using the same instruments and equipment. Fifty patients who have bilateral impacted or erupted mandibular third molars were recruited, extraction was done under local anesthesia (3.6 ml of 4% Articaine, 1:100,000 epinephrine) and intravenous sedation. After extraction, the right extraction socket was packed with Alvogyl and the left one was left without packing. One week later, patients were assessed for presence of dry socket, infection, and severity of pain

using visual analogue scale (VAS). Infection was diagnosed clinically using the cardinal signs (rubor, calor, tumor, and dolor), and presence or absence of pus.

Statistical analysis was performed using SPSS for Windows release 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were generated. Chi-square test and Student's t-test were used to examine differences between groups. Results were considered significant if P-values were less than 0.05.

**Results**

The mean age of the 50 patients recruited in the study was 23 years (range: 17-50 years). There were 34 women and 16 men. Eight women were taking oral contraceptives, and 14 patients were smokers. Twenty three patients (46 third molars) were operated on by specialists and 27 (54 third molars) by residents. Comparison between right third molars (experimental group) and left third molars (control group) in terms of degree of impaction, tooth angulation, type of extraction, and duration of the operation are shown in Table 1. There were no statistically significant differences in these factors when the two groups were compared.

Sixteen cases (32%) of dry sockets were found in the study side and six cases (12%) in the control side (statistically significant difference, X<sup>2</sup> test, P = 0.016). Infection was noticed significantly more in the study side (20 cases, 40%) compared to the control side (5 cases, 10%) (X<sup>2</sup> test, P = 0.001). However, the mean pain score on the study side (1.52 ± 0.51) was significantly lower than that on the control side (1.90 ± 0.30) (t-test, P < 0.001).

**Table 1: Comparing right (experimental side) and left (control side) third molars in terms of difficulty of extraction.**

Variables	Experimental side n (%)	Control side n (%)	P value
Degree of impaction			0.79*
Erupted	9 (18)	8 (16)	
Soft tissue impaction	7 (14)	9 (18)	
Partial bony impaction	20 (40)	16 (32)	
Full bony impaction	14 (28)	17 (34)	

Variables	Experimental side n (%)	Control side n (%)	P value
Third molar angulation			0.14*
Mesioangular	21 (44)	18 (36)	
Distoangular	3 (6)	11 (22)	
Vertical	21 (44)	18 (36)	
Horizontal	5 (10)	3 (6)	
Type of extraction			0.82*
Flapless	13 (26)	14 (28)	
Surgical	37 (74)	36 (72)	
Duration of extraction (min)			0.71 <sup>§</sup>
Mean ± SD	9.74 ± 5.47	10.2 ± 6.63	

n: number. \*Chi-Square test. <sup>§</sup>t-test. SD: standard deviation.

### Discussion

Even though Alvogyl has been shown in our study to reduce postoperative pain at the extraction site, higher incidences of both alveolar osteitis and local operative site infection have been encountered. The reduction in pain at the site of Alvogyl packing could be attributed to the effect of eugenol that is contained in this product.

Syrjanen and Syrjanen<sup>16</sup> studied histologically the healing of extraction sockets when packed by Alvogyl. The authors have reported retarded wound healing of these sockets. There were acute inflammatory infiltrate, persistent granulation tissue, failure to form connective tissue scar and frequent foreign bodies/foreign body giant cells in the sockets packed with Alvogyl.<sup>16</sup> These previous findings support the results we found in this study; retarded healing result in higher chance of dry sockets (32% in the Alvogyl group vs. 12% in the control group) and infection (40% in the Alvogyl group vs. 10% in the control group) of the sockets packed with Alvogyl. The lesser degree of pain the patient felt at the tested side compared to the control side in this study could be a temporary process

The results of the present work, in addition to previously published data<sup>16</sup> negate the systematic or routine use of Alvogyl for pain and infection prophylaxis in third molar surgery. The constituents of Alvogyl when packed in extraction sockets provoke a foreign-body giant cell reaction that hinders the normal healing process that would otherwise proceed normally. However, it may be useful to use Alvogyl as a sterile dressing after the diagnosis of alveolar osteitis, as its components may dull the pain, and help in providing a more pain-free interval until normal healing can be re-achieved.

In conclusion, there is still debate regarding the different materials that could be utilized to prevent dry sockets. It seems more practicable to concentrate on taking care when dealing with the high risk group of patients such as those with poor oral hygiene, older than 40 years of age, those with debilitating medical problems, females taking oral contraceptives, patients receiving immunosuppressive and/or steroid therapy, and smokers.<sup>5-12</sup> Improving oral hygiene, treating dental infections before extractions, and being atraumatic as much as possible during surgery are some of the needed measures.

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