

## Honey in the Management of Dry Socket.

Shahid Hassan<sup>1</sup>, Ajaz Shah<sup>2</sup>, Tajamul Hakim<sup>3</sup>, Zahoor Teli<sup>4</sup>

<sup>1</sup>Consultant, Department of Oral surgery, Government Dental College, J & K, Srinagar, India.

<sup>2</sup>Professor and Head, Department of Oral Surgery, Government Dental College, J & Kashmir, Srinagar, India.

<sup>3</sup>Postgraduate student, Department of Oral Surgery, Government Dental College, Jammu & K, Srinagar, India.

<sup>4</sup>Postgraduate student, Department of Oral Surgery, Government Dental College, J & K, Srinagar, India.

### ABSTRACT

**Background:** The most common post-operative complications following extraction of tooth is dry socket or alveolar osteitis. The aim of our study is to evaluate the efficacy of honey in the management of dry socket. **Methods:** Sixty patients of dry socket were selected from the outpatient department of oral and maxillofacial surgery. A diagnosis of dry socket was made clinically. Honey was used as a dry socket dressing in all the patients. The parameters like pain, swelling, hyperemia, lymphadenopathy and formation of granulation tissue were assessed in the postoperative period upto 3 weeks. **Results:** In this study there was significant reduction in inflammation, hyperemia, and swelling after honey dressing that resulted in soothing effect and reduction in pain and discomfort. No side effect of honey was observed in our study, so it can be used as an alternative for the management of dry socket. **Conclusions:** There are no side effects of honey. Excess use of eugenol can lead to necrosis of bone. The honey can be used as medicament for the management of dry socket.

**Key words:** Dry socket, euginol, honey

### INTRODUCTION

Dry socket or alveolar osteitis is one of the most common post-operative complications following the extraction of permanent teeth. It was first described in the literature by Crawford in 1896. It is a condition in which there is a loss of clot from the socket. Clinically postoperative discomfort can range from simple local inflammation to classic alveolar osteitis including halitosis, regional trismus, dull throbbing pain irradiating from empty socket, normally to ipsilateral ear, temporal region or eye.<sup>[1]</sup> Occasionally regional lymphadenopathy is also noted. It is believed to be multifactorial in origin and there are some common etiological aggravating and precipitating factors. Oral microorganisms, trauma during surgery, root and bone fragments remaining in the cavity, excessive curettage and irrigation, dislodgement of blood clot, oral contraceptives and smoking are some of the important factors. The incidence of alveolar osteitis in routine dental extractions has been reported in the range of 0.5%-5%, however the extraction of mandibular third molars results in higher incidence of alveolar osteitis of 1%-37.5%.

#### **Name & Address of Corresponding Author**

Dr. Shahid Hassan  
Consultant,  
Government Dental College,  
J & K, Srinagar, India.  
Email: [shahidfaciomax@yahoo.co.in](mailto:shahidfaciomax@yahoo.co.in)

The cause of dry socket is fibrinolysis which is the result of plasminogen activation pathway that can be accomplished via direct or indirect activator substances. Direct activators are released due to

trauma while as the case of indirect activators is bacteria.<sup>[2]</sup> There are various treatment modalities used for management of dry socket like bland obtendent dressing, pain reducing dressing such as zinc oxide euginol dressing, anti-infective agents systemic or local, antifibrinolytic agents, surgical intervention to remove necrotic clot and encourage the formation of blood clot. Honey is one of the oldest known medicines and its use has been rediscovered in latter times by the medical profession, especially for dressing wounds. It has been reported from various clinical studies on the usage of honey as a dressing for infected wounds that the wound becomes sterile in 3-6 days, others have also reported that the honey dressing inhibits advancing necrosis. Hence the honey can be used for the management of dry socket.

### MATERIALS AND METHODS

A total number of 60 patients of dry socket were selected from the out-patient Department of Oral and Maxillofacial Surgery. Patients with systemic illness like diabetes, pregnant and lactating female were not included in the study. Sterile gauze soaked with honey was used as a dressing. A diagnosis of dry socket was made clinically. This packing was changed until the post-operative pain symptoms subsided. This study was under taken to evaluate the effect of honey dressing in management of dry socket. All the 60 patients had pain and necrotic slough and 18 patients had halitosis. In 51 patients, symptoms developed at 3rd day and 9 patients reported at 4th day after extraction. [Table 1-5]. Symptoms-resolutions in 33 patients was seen at 5th day, in other 14 patient on 6th day and in 13 patients on 8th day after extraction. [Figures 1-2].

**Table 1:** Total number of patients.

Gender	Number	Total
Male	34	60
Female	26	

**Table 2:** Clinical Symptoms

S No.	Symptom	No. of patients
1	Pain	53
2	Necrotic slough	5
3	Halitosis	2

**Table 3:** Associated Clinical Symptoms

S. No.	Symptom	No. of patients
1	Trismus	37
2	Swelling	14
3	Hemorrhage	5
4	Paresthesia	1
5	Lymphadenopathy	3

**Table 4:** Days of Onset of Symptoms

S No.	Days	No. of patients
1	1	2
2	2	3
3	3	52
4	4	2
5	5	1
6	6	0
7	7	0

**Table 5:** Resolution of Symptoms

Days	No. of patients
1	0
2	0
3	02
4	03
5	28
6	14
7	10
8	13
9	0
10	0

## DISCUSSION

Natural products have been used for several years in folk medicine. Honey has an effective antibacterial potential to combat oral pathogens and hold promises for the treatment of periodontal diseases and mouth ulcers. Honey was used to treat infected wounds as long ago as 2000 years before bacteria was discovered to be cause of infection. 50 AD Dioscorides described honey as being good for all rotten and hollow ulcers. Honey has been reported to have an inhibitory effect to around 60 species of bacteria including aerobes and anaerobes, gram-positive and gram negative microorganisms.<sup>[2]</sup> The antibacterial property of honey was first recognized in 1892 by van Ketel. The minimum inhibitory concentration was found to a range from 1.8% to 10. 8% (v/v) indicating that the honey has

sufficient antibacterial potency to stop bacterial growth if diluted at least 9 times due to its hygroscopic properties, its acidic pH and hydrogen peroxide.<sup>[2]</sup>  $\text{Glucose} + \text{H}_2\text{O} + \text{O}_2 \rightarrow \text{Gluconic acid} + \text{H}_2\text{O}_2$ . It serves to preserve the honey. The major antibacterial activity in honey has been found to be due to hydrogen peroxide produced enzymatically in the honey. Phytochemical factors has an enzyme and tissue nutrition material and vitamins that help repair tissue directly. The proliferation of peripheral blood B lymphocytes and T lymphocytes in cell culture is stimulated by honey at concentration as low as 0.1%. It also stimulates monocytes in cell culture to release cytokines tumor necrosis factors- $\alpha$ , interleukin-1 (IL-1) and IL-6 which activate the immune response to infection.<sup>[2]</sup> There are some other explanations of the antibacterial activity of the honey like.



**Figure 1:** Dry socket of lower first



**Figure 2:** Honey dressing

### Osmotic effect

The honey is saturated or supersaturated solution of the sugar 84% being the mixture of fructose or sucrose, the water content is usually 15-21% by weight. The strong interaction of these molecules with water molecules leaves very few of the water molecules

available for microorganisms. This free water is what is measured as water activity (aw): Mean value for the honey have been reported from 0.562 to 0.62. Many species of bacteria have their growth completely inhibited if (aw) is in the range of 0.94-0.99. Acidity – it is quite acidic its pH is from 3.2 to 4.5, low enough to be inhibitory for many pathogens.

#### **Hydrogen peroxide**

The major antibacterial activity in honey has been found to be due to hydrogen peroxide enzymatically in the honey. The glucose oxidase enzyme is secreted from the hypopharyngeal gland of the bee into the nectar to assist in the formation of honey from the nectar.  $\text{Glucose} + \text{H}_2\text{O}_2 + \text{O}_2 \rightarrow \text{Gluconic acid} + \text{H}_2\text{O}_2$ . This serves to preserve the honey. The hydrogen peroxide produced would be the effect as a sterilizing agent only during ripening of the honey. Full strength honey has a negligible level of hydrogen peroxide because this substance is short lived in the presence of transition metal ions and ascorbic acid in the honey which catalyzes its decomposition to water and oxygen. On dilution of honey the activity increases by a factor of 2500-50,000 thus giving a slow release antiseptic at a level which is antibacterial but not tissue damaging.<sup>[2,3]</sup>

#### **Phytochemical factors**

All the antibacterial activity does not account for peroxide generating system it shows that there must be an additional antibacterial factor involved. Several chemicals with antibacterial activity has been identified in the honey by various researches, pinocembrin, terpenes, benzyl alcohol, 3,5-dimethoxy-4-hydroxy benzoic acid, methyl 3,5-dimethoxy-4-hydroxy benzoate, 3,4,5 trimethoxy benzoic acid, 2 hydroxy, 3 phenyl propionic acid, 2 hydrobenzoic acid and 1,4 dihydroxy benzene.

It appears that the honey from certain plants has better antibacterial properties than from others but there are no sufficient evidence.<sup>[3]</sup> It has been reported from various clinical studies on the uses of honey as dressing for the infected wounds that the wounds become sterile in 3-6 days and other reported that honey is effective in cleaning up infective wounds. It has also been reported that the honey dressing halt advancing necrosis. It has also been found to act as a barrier preventing wounds from becoming infected, preventing cross infection and allowing burn wound to heal rapidly. Honey has been reported to promote the formation of clean healthy granulation tissues. It all reduces inflammation, reduced hyperemia, edema, exudation and soothing effect when applied to wounds.<sup>[2,3]</sup> Hence its physical properties provide a protective barrier, by osmosis, create moist healing environment, in the form of the solution, not to stick underlying tissue.<sup>[4-6]</sup> The antibacterial properties of honey prevents bacterial colonization, of the moist environment and no impairment of the healing process

through adverse effect on wound tissue to the contrary it appears to have a stimulatory effect on tissue regeneration.<sup>[6-11]</sup> There are clean indication of anti-inflammatory action, so this can be used as a therapeutic agent for the dry socket.

### **CONCLUSION**

There are no side-effects of honey. Excess use of eugenol, can lead to necrosis of bone. The honey can be used as a medicament for the management of dry socket.

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