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Effectiveness of Curcumin Gel Versus Alvogyl for The Treatment of Dry Socket: Quasi Experimental Trial

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Abstract: ***Dry socket is a post operative complication that disrupts healing after tooth extraction. There are various modalities for the treatment of dry socket like use of obtundant, pain reducing dressing such as zinc oxide eugenol dressing, anti - infective agents, anti - fibrinolytic agents and surgical intervention were also encouraged. In this study the efficacy of Curcumin gel will be compared with the Alvogyl in the treatment of dry socket. Method: A total of 30 patients were randomly allocated into 2 groups of 15 each. In Group A, Curcumin oral gel was applied as an intra socket medication whereas Group B was treated with Alvogyl paste. Result: Both the Alvogyl and Curcumin gel had similar beneficial properties in reducing the pain and swelling. Even though 26.7% of participants in Curcumin group had excellent wound healing when compared to 13.3% from Alvogyl group, it was statistically not significant. Conclusion: Both Curcumin gel pastes and Alvogyl provide similar results in terms of pain relief and healing when used for the treatment of dry socket.***

Keywords: Dry Socket, Curcumin gel, Alvogyl, Alveolar Osteitis, wound healing

1. Introduction

Dry socket/alveolar osteitis (AO) is one of the most common and unpleasant postoperative complications following extraction of permanent teeth. The term ‘‘dry socket’’ has been used in literature since 1896, when it was first described by Crawford[1]. Efforts have been made to define dry socket more accurately through the use of terms such as AO, localized osteitis, post extraction osteomyelitis syndrome, alveolalgia, avascular socket, alveolitis sicca dolorosa, delayed extraction wound healing, and fibrinolytic alveolitis[1]. However, the term dry socket continues to be used popularly which is characterized by intense throbbing pain, accumulation of disintegrated clot and food debris in the socket and mal odor. The etiology of the dry socket remains poorly understood. However, certain theories suggest that the contributing factors to the etiology includes early dislodgment of blood clot of extraction site, any trauma due to surgery, secondary infection, or any nutritional deficiency, or drug related and tobacco induced[1].

There are various modalities used for management of dry socket like use of obtundant & pain reducing dressing such as zinc oxide eugenol dressing, anti - infective agents, systemic or local, anti - fibrinolytic agent & surgical intervention to remove necrotic clot & encourage the formation of blood clot. Treatment includes administration of drugs either locally or systemically in an attempt to initiate wound repair[2].

Turmeric is an amazing natural herbal with healing properties. It has been used as traditional remedy in Ayurvedic medicine for thousands of years. It has powerful anti - oxidant & anti - inflammatory properties. Turmeric has many valuable components but the one seems getting attention is “curcumin”. Curcumin is a yellow pigment present in the spice turmeric (curcuma Longa) & has been linked with anti - oxidant, anti - inflammatory, anti - proliferative, anti - diabetic, anti - cancer, anti - viral & anti Rheumatic effects[2].

Alvogyl (Septodont, France) is an intra - socket medication for dry socket contents of which are following. Butlyparaminobenzoate (25.7%) as an anaesthetic, Iodoform (15.8%) as an antimicrobial, Eugenol (13.7%) which retards the inflammatory process and also relief the pain by inhibiting the action of prostaglandins and Penghawar (3.5%) as an anti - inflammatory agent[1].

Few studies in nature have compared the efficacy of Curcumin oral gel and Alvogyl, for the management of Dry Socket. Hence, we conducted a short study to compare the efficacy of Curcumin gel versus Alvogyl in the treatment of dry socket using various parameters. This study is significant as it explores a cost - effective, natural alternative to conventional treatments, potentially broadening theraputic options for dry socket management.

2. Review of Literature

- Lenka S, Rathor K, Varu R, Dalai RP in their study’ Comparison between Alvogyl and Zinc Oxide Eugenol Packing for the Treatment of Dry Socket: A Clinical Study’ found Onset of pain relief with Alvogyl was faster than ZOE. Although ZOE was most cost effective and easily available medicament for dressing. Both the medicaments showed positive outcomes but Alvogyl proved slightly better than ZOE.
- Lone PA, wakeel Ahmed S, Prasad V, Ahmed B in their study ‘Role of turmeric in management of alveolar osteitis (dry socket): A randomized clinical study’ found there was significant reduction in pain, inflammation & discomfort after turmeric and ZOE dressing. Wound

healing was seen faster, than dressing with ZOE. There is no side effect of Turmeric. Statistical analysis was done $p < 0.05$, was found statistically significant.

- Mugilan R, Jayaswal R, Sowmya R, Vincent SS, Vaishali K, Prasad K. 'Effect of Curcumin on Healing of Extraction Sockets in Type II Diabetic Patients' found that Curcumin is a safe, natural herb, giving good results in the healing of the extraction socket in diabetic patients, with definite improvement in the soft tissue healing
- Acharya D, Sethi AK, Mitra M, Taniya K. in their study 'Comparison Between Neocone, Alvogyl and Zinc Oxide Eugenol packing for The Treatment of Dry Socket' found Alvogyl is superior to the other two medications for providing initial pain relief. Neocone provides complete pain relief and the healing was fastest with Neocone. Neocone emerged as the most suitable dressing material for the management of dry socket by virtue of shorter time required for complete pain relief, fewer visits and faster clinical healing.

Aim

To evaluate the effectiveness of curcumin oral gel compared to Alvogyl in the management of dry socket.

Objectives:

1) To compare and assess the healing of the dry socket based on "Healing Index by Landry" between the Group A and Group B
2) To compare and assess the post operative pain using VAS scale between Group A and Group B

3. Methodology

Source of Sample:

30 Patients who reported to the Department of Oral and Maxillofacial Surgery, A. J. Institute of Dental Sciences, Mangalore with clinical diagnosis of Dry Socket following extraction between October 2023 and December 2023.

This study was carried out in the Department of Oral and Maxillofacial Surgery, A. J. Institute of Dental Sciences, Mangalore after obtaining approval from the Institutional Research and Ethical Committee. Patients were provided with a detailed explanation of the procedure and a written consent was obtained from each participant.

Study Design:

QUASI EXPERIMENTAL study with 3 follow ups would be conducted. The study participants will be divided into 2 groups
GROUP A - Curcumin gel (15 Study participants)
GROUP B - Alvogyl (15 Study participants)
The study participants were selected based on convenience sampling.
Day 1 - Day of clinical diagnosis of Dry socket.
Day 5 - Follow up and assessment of pain and socket healing.
Day 10 - follow up and assessment of pain and status of the healing socket.

Duration of Study:

3 Months

Inclusion Criteria:

- Subjects who are clinically diagnosed with Dry socket following extraction.
- Age group 18 - 50 years.

Exclusion Criteria

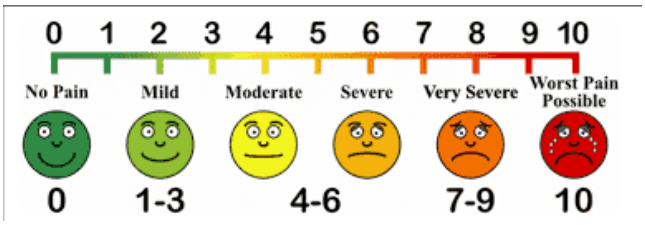
- Patients who are chronic smokers.
- Study participants with known allergy to turmeric, iodoform, butamben, or eugenol.
- Study participants unwilling to sign the informed consent form

Method

- A total number of 30 patients who required treatment for dry socket following extraction were included in the study.
- X - Ray (Intra Oral Periapical Radiograph) was obtained to exclude presence of root or bony fragments within the socket.
- All the 30 patients were randomly allocated in two groups based on convenience sampling.
- Group A (N=15 patients) - Curcumin oral gel as an intra - socket medication
- Group B (N=15 patients) - Alvogyl paste as an intra - socket medication.
- The patients were blinded to the use of Curcumin gel or Alvogyl.
- All patients in the study had been prescribed Analgesic Tab Ketorolac (10 mg orally S. O. S) and patients allergic to Ketorolac Paracetamol 650mg as rescue medication.

Assessment

- The assessment of each patient was done on the basis of pain and healing after 5 days and 10 days.
- The assessment was carried out using VAS (visual analogue scale) and soft tissue 'healing index by Landry et al'.

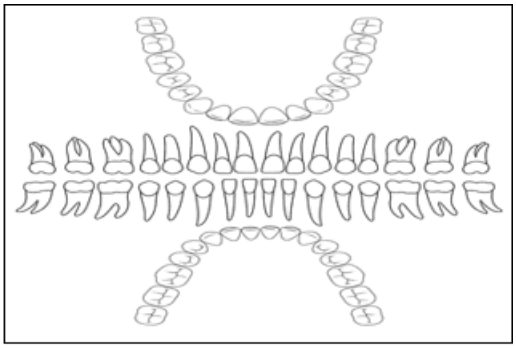


Healing index by Landry et al 1988

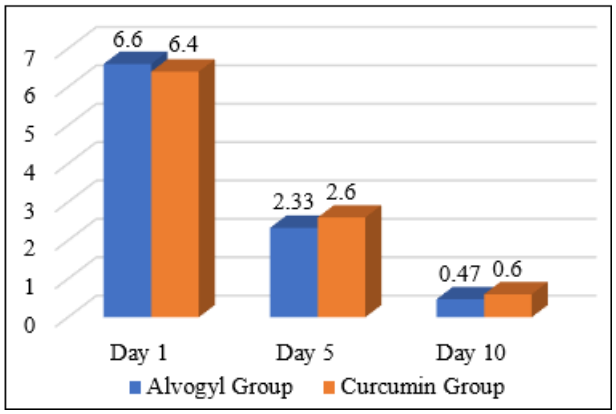
Score	Clinical signs
Healing index 1: very poor	Tissue color: ≥50% of gingiva red
	Response to palpation: bleeding
	Granulation tissue: present
	Incision margin: not epithelialized with loss of epithelium beyond incision margin
	Suppuration: present
Healing index 2: poor	Tissue color: ≥50% of gingiva red
	Response to palpation: bleeding
	Granulation tissue: present
	Incision margin: not epithelialized with connective tissue exposed
Healing index 3: good	Tissue colorr: ≥25% and <50% of gingiva red
	Response to palpation: no bleeding
	Granulation tissue: none
	Incision margin: no connective tissue exposed
Healing index 4: very good	Tissue color: <25% of gingiva red
	Response to palpation: no bleeding
	Granulation tissue: none
	Incision margin: no connective tissue exposed
Healing index 5: excellent	Tissue color: all tissues pink
	Response to palpation: no bleeding
	Granulation tissue: none
	Incision margin: no connective tissue exposed

Armamentarium

- Sterile drape
- 2% plain lignocaine
- Irrigation with betadine and saline solution
- 20 ml syringe
- Curenext Oral gel
- Alvogyl
- Mouth mirror
- Tweezer



4. Results



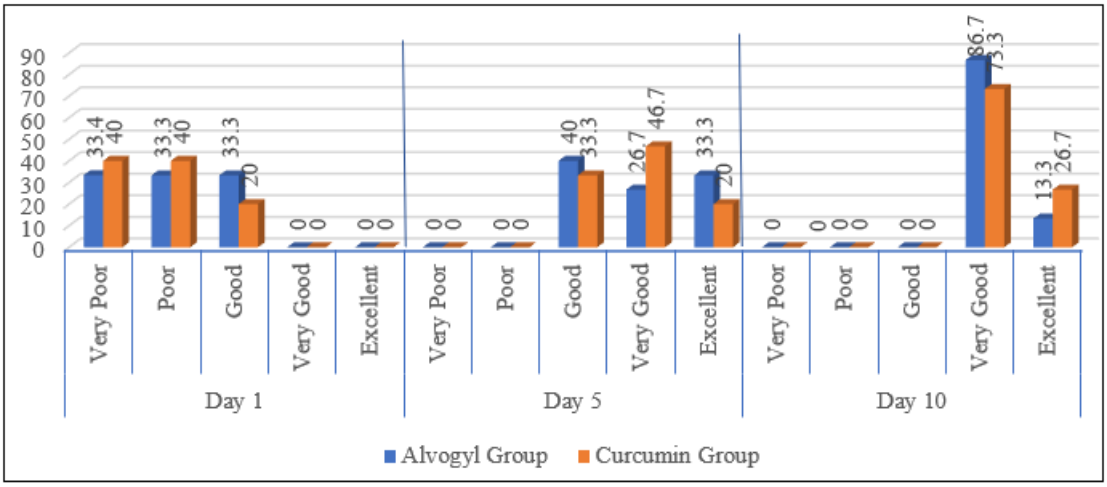
Graph A: Mean VAS pain score between Alvogyl and Curcumin Group at different time intervals

Table 1: Comparison of mean VAS pain scores between Alvogyl and Curcumin Group at different time intervals

		N	Mean	SD	P value
Day 1	Alvogyl Group	15	6.6	0.9	P = 0.55
	Curcumin Group	15	6.4	0.9	NS
Day 5	Alvogyl Group	15	2.33	0.9	P = 0.47
	Curcumin Group	15	2.6	1.12	NS
Day 10	Alvogyl Group	15	0.47	0.74	P = 0.62
	Curcumin Group	15	0.6	0.73	NS

N - Number; SD - standard deviation; NS - Not significant using unpaired t test

It was found that there was no statistically significant difference in pain scores between Alvogyl and Curcumin group at DAY 1 (P = 0.55) and Day 10 (P = 0.62) respectively.



Graph 2: Distribution of participants according to healing index between Alvogyl and Curcumin group at different time intervals

Table 2: Comparison of distribution of participants according to healing index between Alvogyl and Curcumin group at different time intervals

		Very Poor N (%)	Poor N (%)	Good N (%)	Very Good N (%)	Excellent N (%)	Total N	P value
Day 1	Alvogyl Group	5 (33.4)	5 (33.3)	5 (33.3)	0	0	15	P = 0.71
	Curcumin Group	6 (40)	6 (40)	3 (20)	0	0	15	NS
Day 5	Alvogyl Group	0	0	6 (40)	4 (26.7)	5 (33.3)	15	P = 0.49
	Curcumin Group	0	0	5 (33.3)	7 (46.7)	3 (20)	15	NS
Day 10	Alvogyl Group	0	0	0	13 (86.7)	2 (13.3)	15	P = 0.6
	Curcumin Group	0	0	0	11 (73.3)	4 (26.7)	15	NS

N - number; % - percentage; NS - not significant using Chi square test

Day 1

It was found that 33.4% and 40% of participants had very poor to poor healing in Alvogyl and Curcumin group respectively. In addition, 33.3% of participants in Alvogyl group had good healing compared to 20% in Curcumin group. This however was not statistically significant (P = 0.71).

Day 5

It was found that 40% and 33.4% of participants had good healing in Alvogyl and Curcumin group respectively. In addition, 26.7% and 46.7% of participants in Alvogyl group and Curcumin group had very good wound healing. Furthermore, 33.3% of participants in Alvogyl group had excellent healing compared to 20% in Curcumin group. This however was not statistically significant (P = 0.49).

Day 10

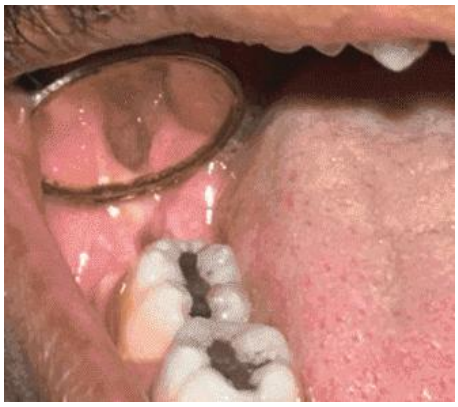
It was found that 86.7% and 73.3% of participants had very good to excellent healing in Alvogyl and Curcumin group respectively. In addition, 13.3% of participants in Alvogyl group had excellent wound healing compared to 26.7% in Curcumin group. This however was not statistically significant (P = 0.6).

In other words, it can be concluded that Alvogyl and Curcumin had similar beneficial properties in reducing pain and swelling. Though 26.7% of participants in Curcumin group had excellent wound healing when compared to 13.3% from Alvogyl group, it was not statistically significant.

Photographs

ALVOGYL:

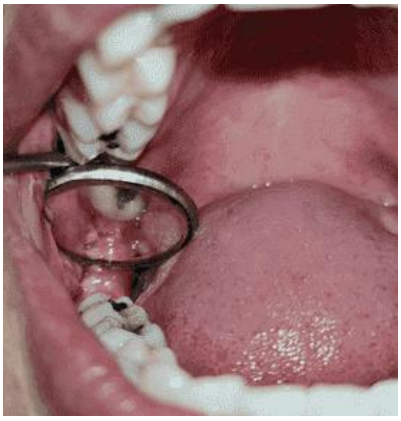
1st Sitting



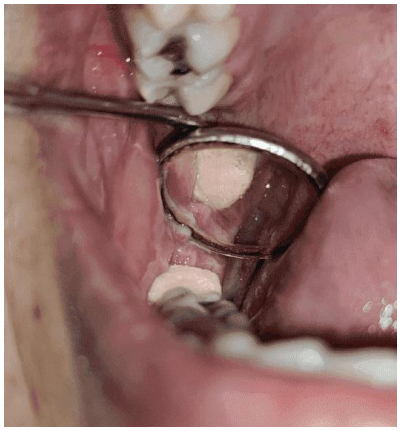
5 Day Follow - Up

10 Day Follow - Up

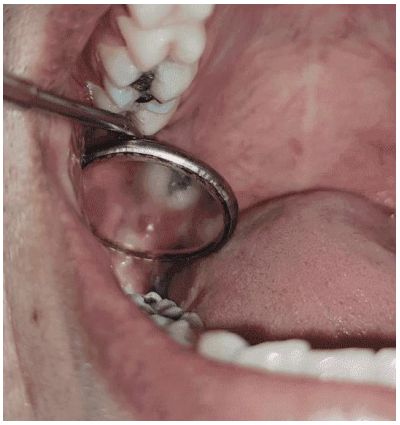
Curenext:

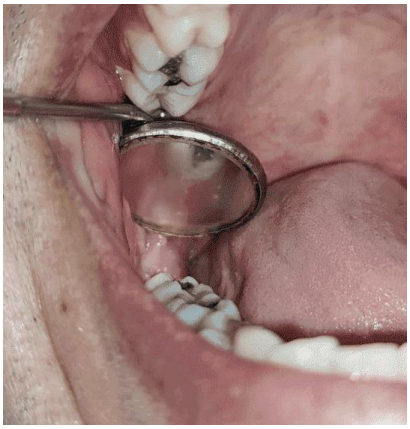


1st Sitting



5 Day Follow - Up





10 Day Follow - Up

5. Discussion

Alveolar osteitis is one of the most common complications that arise as a postoperative complication associated frequently with the extraction. Since the pain of dry socket as experienced by the patients is severe and excruciating, this mandates timely management to relieve the discomfort and pain of the patients. Different risk factors are associated with a greater tendency to develop dry sockets such as smoking, use of oral contraceptives, female gender, suppression of the immune system, and traumatic extractions.

In our study, most of the patients suffered from severe pain, confirmed using a visual analog scale when they were diagnosed to suffer from dry socket. Since the bone around the socket is exposed to the oral environment with supplemental action of the bacteria, these factors lead to the severe pain of the dry socket.
The present study was conducted with 3 follow ups. The study participants were divided into 2 groups, with Group 1: Curcumin gel and Group 2: Alvogyl with 15 each. The study participants were selected based on convenience sampling.
Day 1: Clinical diagnosis
Day 2: Follow up and status of dressing
Day 3: Follow up and status of healing socket

The present study it has found that there was NO statistically significant difference in pain scores between the Curcumin and Alvogyl group at day 1, day 5 and day 10. Both Alvogyl and Curcumin gel paste had similar beneficial properties in reducing both pain and promoting the healing of the socket.

As this study evaluated the effectiveness of obtundants, this study lacks time of application and stability of the obtundent in the socket as parameters of consideration which might play important role in their use and selection by the clinician. Both the medicaments have an associated taste which may not be acceptable to all the patients and was not accounted for in this study, but might be important for long term usage and compliance by the patient.

We also noted that Curcumin gel offers a cost - effective advantage over Alvogyl but has a disadvantage in terms of ease of application as the time required to manipulate and stabilize the paste in socket is more when compared to Alvogyl.

Both of the medicaments provide a viable treatment option for the management of dry socket as the results of the study indicate, with no significant difference in the outcomes.

6. Conclusion

The use of both Curcumin gel paste and Alvogyl resulted in decrease of pain score and improvement in the healing of socket but there was no significant difference between the use of both the medicaments. However, the cost factor and ease of application plays a role, with curcumin being more cost effective and Alvogyl being easier to use. The difference lies between the preference of the clinician as the results indicate an equal level of healing.

Conflict of Interest
None declared

Acknowledgement
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