

Studying the Clinical Efficacy of Using Blue M Gel in Healing of Post Extraction Sockets

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Citation This Article: Dr. Anjali Dhull, Dr. Krishnapriya Singh Nagtilak, Dr. Shivangi Shreya, “Studying the Clinical Efficacy of Using Blue M Gel in Healing of Post Extraction Sockets”, IJHDC – July – August – 2026, Volume. – 5, Issue – 4, P. No. 54 – 60.

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Extraction of the teeth starts a cascade of the events for healing in both the hard and the soft tissues. For better healing, various dressing has been used and explored that also minimize the complications seen after extraction such as dry socket formation. One such agent is Blue M gel which is an oxygen releasing dressing that depict good results concerning the better healing in various aspects of dentistry. However, existing literature is scarce on its efficacy for post-extraction sockets.

Aim: The present study was aimed to study the clinical efficacy of using BLUE M gel in healing of post extraction sockets.

Methods: The present study assessed 60 subjects that were undergoing tooth extraction at the Institute within the defined study period. These subjects were divided into two groups where Group I subjects were given Blue M oral gel to be applied in post-extraction socket and Group II subjects were applied with a placebo jelly after extraction. Healing was assessed with Landry Healing Index and pain was assessed using VAS (Visual Analogue Scale) on 3rd and 7th day postoperatively.

Results: The study results showed that on 3rd day postoperative, mean VAS scores for pain were significantly lesser in Group with Blue M gel compared to Group II with placebo gel with $p=0.0001$. on 7th day postoperative, Landry Healing Index was significantly

better in Blue M gel group compared to placebo group with $p < 0.001$ depicting better and fast healing with Blue M gel than placebo.

Conclusion: The present study concludes that Blue ® M oral gel has significantly better healing in post-extraction sockets with lesser pain in early postoperative time. Hence, it is a promising agent and can replace the conventional dressing to allow for better and faster healing of alveolar bone after tooth extraction.

Keywords: Blue ® M Oral Gel, Oxygen Therapy, Post-Extraction Alveolar Socket, Wound Healing.

Introduction

Recently, there has been a comprehensive progress in preventive and restorative dentistry; extraction of the teeth remains a basic dentistry procedure. Tooth extraction is a process that includes careful removal of a tooth or tooth root with minimum trauma to the surrounding tissues to allow uneventful healing and prevention of post-procedure complications. Healing for extraction socket involve both hard and soft tissues with socket closure and regeneration of new bone.¹

Complications after extraction can be long-term, delayed or immediate. Immediate complications are nerve damage, alveolar bone fractures, root fractures, and failure of anesthesia. Delayed complications are alveolar osteitis, swelling, soft tissue infections, and excessive pain. In the long-term, complications as neuropathic pain and chronic osteomyelitis can develop that could affect the overall health. Bacterial colonization has been involved in delayed healing owing to increase in the microbial load.²

Various therapies have been assessed for better healing of the extraction socket including different dressings. One such agent being oxygen therapy which was used in dentistry for more than a century. In the recent past,

topical oxygen therapy has gained wide popularity in intraoral wound and soft-tissue care with literature reporting its role in controlling the microbial imbalance and better healing of extraction socket. Blue M gel is one such topical oxygen therapy having antimicrobial benefits and better post-extraction healing. The gel has sodium per borate and glucose oxidase that on contacting tissue fluids produce hydrogen peroxide in low concentration. It also contains lacto ferrin which enhance osteoblast proliferation and hence, bone regeneration.³

Blue®M oral gel has various benefits in oral wound healing stimulation of growth factors release, acceleration of cellular metabolism, supporting wound regeneration, and enhancing collagen synthesis. Also, the gel promotes angiogenesis that provide adequate blood supply to healing extraction socket. Owing to its wide potential as therapeutic agent, it also provides benefit to prevent bacterial colonization, accelerating healing of soft-tissues, and minimize the post-extraction bleeding. The present study was aimed to study the clinical efficacy of using BLUE M gel in healing of post extraction sockets.

Materials and methods

The present prospective randomized controlled study was aimed to study the clinical efficacy of using BLUE M gel in healing of post extraction sockets. The study subjects were from Department of Conservative Dentistry and Endodontics. Verbal and written informed consent were taken from all the subjects before study participation.

The present study assessed 60 subjects that were undergoing tooth extraction at the Institute within the defined study period. These subjects were divided into two groups where Group I subjects were given Blue®M

oral gel to be applied in post-extraction socket and Group II subjects were applied with a placebo jelly after extraction. Healing was assessed with Landry Healing Index and pain was assessed using VAS (Visual Analogue Scale) on 3rd and 7th day postoperatively.

The inclusion criteria for the study were subjects from both the genders aged 15-55 years having good oral hygiene, needed elective extraction for causes as esthetic concerns, orthodontic purposes, retained deciduous teeth, or supernumerary teeth. The exclusion criteria for the study were subjects with systemic disorders affecting wound healing, medically compromised individuals (ASA III and above), chronic smokers or alcoholics, and with cystic or tumorous teeth.

The surgical procedure was done under strict aseptic conditions after subjects rinsed with 0.2% Chlorhexidine Gluconate before local anesthesia administration as 2% lignocaine with 1: 80,000 adrenalin. Extractions were done in minimal trauma to surrounding tissues. After extraction, 1.5 ml of Blue®M oral gel or KY placebo Jelly was applied into the socket using syringes. Subjects were given standard postoperative instruction on prescribed analgesics (Aceclofenac 100 mg + Paracetamol 325 mg), to avoid smoking and forceful spitting, and diet counseling. The subjects were followed till 1 week.

On postoperative follow-up visit on 3rd and 7th day, pain was measured using VAS (visual analogue scale) and healing was assessed using Landry Healing Index that provides a standard and quantitative assessment of healing extraction socket. It assesses five parameters namely radiographic evidence of bone healing, epithelialization, granulation tissue formation, inflammation, and bleeding. Each parameter was given a

score with total scores showing the overall status of the healing.

Results

The present prospective randomized controlled study was aimed to study the clinical efficacy of using BLUE M gel in healing of post extraction sockets. The present study assessed 60 subjects that were undergoing tooth extraction at the Institute within the defined study period. These subjects were divided into two groups where Group I subjects were given Blue®M oral gel to be applied in post-extraction socket and Group II subjects were applied with a placebo jelly after extraction. Healing was assessed with Landry Healing Index and pain was assessed using VAS (Visual Analogue Scale) on 3rd and 7th day postoperatively. For comparison of pain scores at different time interval in two group of study subjects, at day 0 before extraction, VAS scores were comparable in two groups with $p=1.000$. At day 3 postoperative, pain scores were significantly lower in Blue M gel group compared to placebo gel with $p=0.0001$. At day 7, VAS scores were comparable in Blue M gel and placebo group with $p=0.311$ (Table 1).

It was seen that for comparison of pain scores at different time intervals in Blue M gel group, for blue M gel, mean scores at day 0 were significantly lesser compared to day 3 with the p -value of <0.001 . For Blue M gel, the VS scores were higher on day 0 compared to day 7. However, the difference was statistically non-significant with $p=0.476$. A significant reduction was seen from Day 3 to day 7 in Blue M gel group with the p -value of <0.001 (Table 2).

The study results showed that for comparison of pain scores at different time intervals in placebo gel group, the scores increased significantly from day 0 to day 3

with p-value of <0.001 . A non-significant increase was seen in placebo gel group from day 0 to day 7 with the p-value of 0.476. In placebo gel group, a statistically significant decrease was seen from day 3 to day 7 with the p-value of <0.001 (Table 3).

Concerning the comparison of extraction socket healing at different time interval in two study groups, at day 3, healing scores were significantly higher in Blue M gel group compared to placebo group with the p-value of 0.01. Similar results were seen at day 7 where mean healing scores were significantly higher in Blue M gel group compared to placebo group with the p-value of <0.0001 (Table 4). For comparison of mean operative time in two study groups, mean operative time in placebo group and Blue M gel group was comparable with the p-value of 0.901 (Table 5).

Discussion

The present study assessed 60 subjects that were undergoing tooth extraction at the Institute within the defined study period. These subjects were divided into two groups where Group I subjects were given Blue®M oral gel to be applied in post-extraction socket and Group II subjects were applied with a placebo jelly after extraction. Healing was assessed with Landry Healing Index and pain was assessed using VAS (Visual Analogue Scale) on 3rd and 7th day postoperatively. For comparison of pain scores at different time interval in two group of study subjects, at day 0 before extraction, VAS scores were comparable in two groups with $p=1.000$. At day 3 postoperative, pain scores were significantly lower in Blue M gel group compared to placebo gel with $p=0.0001$. At day 7, VAS scores were comparable in Blue M gel and placebo group with $p=0.311$. These results were in agreement with the findings of Grover M et al⁵ in 2025 and Juliana H et al⁶

in 2022 where results comparable to the present study were also reported by the authors.

The study results showed that for comparison of pain scores at different time intervals in Blue M gel group, for blue M gel, mean scores at day 0 were significantly lesser compared to day 3 with the p-value of <0.001 . For Blue M gel, the VS scores were higher on day 0 compared to day 7. However, the difference was statistically non-significant with $p=0.476$. A significant reduction was seen from Day 3 to day 7 in Blue M gel group with the p-value of <0.001 . These findings were consistent with the results of Blasi A et al⁷ in 2023 and Baqain ZH et al⁸ in 2008 where results reported by the authors for comparison of pain scores at different time intervals in Blue M gel group were comparable to the results of the present study.

It was seen that for comparison of pain scores at different time intervals in placebo gel group, the scores increased significantly from day 0 to day 3 with p-value of <0.001 . A non-significant increase was seen in placebo gel group from day 0 to day 7 with the p-value of 0.476. In placebo gel group, a statistically significant decrease was seen from day 3 to day 7 with the p-value of <0.001 . These results correlated with the findings of Rastogi S et al⁹ in 2018 and Churasia NK et al¹⁰ in 2017 where results for pain scores at different time intervals in placebo gel group comparable to the present study were also reported by the authors.

For the comparison of extraction socket healing at different time interval in two study groups, at day 3, healing scores were significantly higher in Blue M gel group compared to placebo group with the p-value of 0.01. Similar results were seen at day 7 where mean healing scores were significantly higher in Blue M gel group compared to placebo group with the p-value of

<0.0001. For comparison of mean operative time in two study groups, mean operative time in placebo group and Blue M gel group was comparable with the p-value of 0.901. These findings were in line with the results of Dissemond J et al¹¹ in 2015 and Larjava H et al¹² in 2015 where data reported by the authors for extraction socket healing at different time interval with Blue M gel were comparable to the results of the present study.

Conclusion

The present study, considering its limitations, concludes that Blue®M oral gel has significantly better healing in post-extraction sockets with lesser pain in early postoperative time. Hence, it is a promising agent and can replace the conventional dressing to allow for better and faster healing of alveolar bone after tooth extraction.

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Legend Tables

Table 1: Comparison of pain scores at different time interval in two group of study subjects.

Sn.	VAS scores	Groups	Mean	p-value
1.	Day 0 (before extraction)	Group I	1.51±0.50	1.000
		Group II	1.51±0.50	
2.	Day 3 postoperative	Group I	4.02±0.91	0.0001
		Group II	5.38±0.49	
3.	Day 7 postoperative	Group I	1.42±0.49	0.311
		Group II	1.71±1.01	

Table 2: Comparison of pain scores at different time intervals in Blue M gel group.

Sn.	VAS scores	Time	Mean	p-value
1.	Blue M gel	Day 0	1.51±0.50	<0.001
		Day 3	4.02±0.91	
2.	Blue M gel	Day 0	1.51±0.50	0.476
		Day 7	1.42±0.49	
3.	Blue M gel	Day 3	4.02±0.91	<0.001
		Day 7	1.42±0.49	

Table 3: Comparison of pain scores at different time intervals in placebo gel group.

Sn.	VAS scores	Time	Mean	p-value
1.	Placebo gel	Day 0	1.51±0.50	<0.001
		Day 3	5.42±0.49	
2.	Placebo gel	Day 0	1.51±0.50	0.476
		Day 7	1.71±1.01	
3.	Placebo gel	Day 3	5.42±0.49	<0.001
		Day 7	1.71±1.01	

Table 4: Comparison of extraction socket healing at different time interval in two study groups.

Sn.	Landry healing index	Groups	Mean	p-value
1.	Day 3	Blue M gel	3.11±0.62	0.01
		Placebo gel	2.45±0.62	
2.	Day 7	Blue M gel	4.02±0.51	<0.0001
		Placebo gel	2.58±0.72	

Table 5: Comparison of mean operative time in two study groups.

Sn.	Groups	Mean time	p-value
1.	Placebo gel	30.78±9.44	0.901
2.	Blue M gel	30.38±8.85	