Case Study

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Effect of Immediate Versus Delayed Chlorhexidine Rinse on Post-Extraction Pain: A Randomized Clinical Study

H. L Gupta[1], Sumit Bhatt[2], Vaibhaviben Patel[3], Shreya Gill[4], Pankajakshi Bai K[5], Sai Sagar[6]

[1]HOD & Professor, Principal, Department of Periodontology and Oral Implantology, Rajasthan Dental College and, Hospital, Nirwan University, Jaipur, Rajasthan.
[2]PhD Scholar, Assistant Professor, Department of Oral and Maxillofacial Surgery, Rajasthan Dental College & Hospital, Nirwan University, Jaipur, Rajasthan.
[3]Dynamic Dental, Toronto, Canada
[4]MDS (Conservative Dentistry and Endodontics), DMD, Virginia, USA
[5]Principal, Professor & Head, Department of Oral & Maxillofacial Surgery, College of Dental Science & Hospital, Amargadh, Sihor Taluk, Bhavnagar District, Gujarat-364210
[6]Senior House Surgeon, Govt Hospital Neyattinkara, Trivandrum, Kerala

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ABSTRACT

Background: Chlorhexidine mouth rinse is routinely prescribed after tooth extraction to reduce microbial load. However, the optimal timing of its use remains unclear and may influence postoperative pain.

Aim: To compare the effect of immediate versus delayed chlorhexidine mouth rinse on post-extraction pain following simple tooth extraction.

Materials and Methods: Sixty systemically healthy patients undergoing simple tooth extraction were randomly allocated into two groups. Group I used 0.12% chlorhexidine mouth rinse immediately after extraction, while Group II initiated the rinse 24 hours post-extraction. Postoperative pain was evaluated using a Visual Analog Scale (VAS) on postoperative day 1 and day 3. Statistical analysis was performed using the independent t-test with significance set at $p < 0.05$.

Results: Patients in the immediate rinse group reported significantly higher pain scores on postoperative day 1 compared to the delayed rinse group ($p < 0.05$). By postoperative day 3, pain scores decreased in both groups, with no statistically significant difference observed.

Conclusion: Delaying the use of chlorhexidine mouth rinse for 24 hours after tooth extraction reduces early postoperative pain. Avoidance of immediate rinsing may help preserve the blood clot and enhance patient comfort during the initial healing period.

Introduction

Tooth extraction is one of the most frequently performed procedures in oral and maxillofacial surgery and is commonly associated with postoperative pain and discomfort.[1,2] The intensity of post-extraction pain depends on multiple factors, including surgical trauma, inflammation, and the stability of the blood clot within the extraction socket. Preservation of the blood clot is critical for normal healing and prevention of postoperative complications.[3-5]

Chlorhexidine mouth rinse is widely prescribed following tooth extraction because of its broad-spectrum antimicrobial activity and proven effectiveness in reducing oral microbial load. Its use is believed to minimize postoperative infection and enhance wound hygiene. However, the mechanical action of rinsing in the immediate postoperative period may

Corresponding author: H. L Gupta

Email id: hlgupta7@yahoo.co.in

disturb the newly formed blood clot, potentially increasing inflammation and pain.[6,7]

Despite the routine use of chlorhexidine after extractions, there is limited evidence regarding the optimal timing of its initiation. While some clinicians recommend immediate rinsing, others advise delaying mouth rinses for 24 hours to allow stabilization of the clot. The lack of clear guidelines has resulted in variation in postoperative instructions among practitioners.

Therefore, this study was undertaken to evaluate and compare the effect of immediate versus delayed initiation of chlorhexidine mouth rinse on post-extraction pain following simple tooth extraction. The findings aim to provide evidence-based guidance for postoperative care to improve patient comfort and clinical outcomes.

Materials and Methods

Study Design: This study was designed as a prospective, randomized clinical study conducted in the Department of Oral and Maxillofacial Surgery.

Study Setting and Duration: The study was carried out at the outpatient department of Oral and Maxillofacial Surgery over a period of three months.

Study Sample: A total of 60 patients requiring simple tooth extraction were included in the study.

Ethical Considerations: Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Written informed consent was obtained from all participants after explaining the nature and purpose of the study.

Inclusion Criteria

1. Patients aged 18–50 years.
2. Systemically healthy individuals.
3. Patients requiring simple tooth extraction under local anesthesia.
4. Patients willing to participate and comply with follow-up visits.

Exclusion Criteria

1. Patients requiring surgical extraction
2. Smokers and tobacco users
3. Patients with a history of systemic diseases affecting healing
4. Patients on antibiotics or analgesics prior to extraction
5. Pregnant or lactating women
6. Patients with existing oral infections at the extraction site

Randomization and Group Allocation: Participants were randomly allocated into two groups using a simple randomization method:

Group I (Immediate Rinse Group): 30 patients

Group II (Delayed Rinse Group): 30 patients

Surgical Procedure: All extractions were performed by the same operator to minimize procedural variability. Local anesthesia was administered using 2% lignocaine with 1:80,000 adrenaline. Standard forceps extraction technique was followed, and care was taken to minimize trauma. No sutures were placed.

Intervention Protocol:

Group I: Patients were instructed to start rinsing with 0.12% chlorhexidine gluconate mouth rinse on the day of extraction, beginning 30 minutes after the procedure.

Group II: Patients were instructed to begin chlorhexidine rinsing 24 hours after extraction.

In both groups, patients were advised to rinse twice daily for 7 days, using 10 ml of the solution for 30 seconds.

Postoperative Instructions: All patients received standardized postoperative instructions, including avoidance of spitting, vigorous rinsing, and hot food intake for the first 24 hours. A uniform analgesic regimen (ibuprofen 400 mg twice daily for 3 days) was prescribed for all participants.

Outcome Assessment

Pain Evaluation: Post-extraction pain was assessed using a Visual Analog Scale (VAS) ranging from 0 (no pain) to 10 (severe pain). Pain scores were recorded on: Postoperative Day 1, and Postoperative Day 3. Patients were instructed to record their pain score based on their average pain experienced on the respective days.

Data Collection: All clinical data and pain scores were recorded in a predesigned proforma.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using statistical software. Mean and standard deviation were calculated for pain scores. **Independent t-test** was used to compare pain scores between the two groups. A p-value of **< 0.05** was considered statistically significant.

Result

Demographic Characteristics: The study included a total of 60 patients, with 30 patients in each group. In Group I (immediate chlorhexidine rinse), the mean age of participants was 34.2 ± 8.1 years, while in Group II (delayed chlorhexidine rinse), the mean age was 35.6 ± 7.8 years. Group I comprised 16 males and 14 females, whereas Group II included 15 males and 15 females. No statistically significant difference was observed between the two groups with respect to age or gender distribution ($p > 0.05$), indicating that the groups were comparable at baseline. (Table 1)

Postoperative Pain Scores: Post-extraction pain was assessed using the Visual Analog Scale on postoperative day 1 and day 3. On postoperative day 1, the mean VAS pain score in Group I was 4.9 ± 1.2, which was significantly higher than the mean score of 3.6 ± 1.1 recorded in Group II. This difference was found to be statistically significant (p = 0.001). By postoperative day 3, pain scores had reduced in both groups, with Group I showing a mean VAS score of 2.1 ± 0.9 and Group II showing a mean score of 1.9 ± 0.8. The difference in pain scores between the two groups on day 3 was not statistically significant (p = 0.34). (Table 2)

Table 1: Demographic Distribution of Study Participants

Variable	Group I (Immediate Rinse)	Group II (Delayed Rinse)	P value
Number of patients	30	30	-
Mean age (years)	34.2 ± 8.1	35.6 ±7.8	0.48
Gender (Male/ Female)	16/14	15/15	0.79

Table 2: Comparison of Mean VAS Pain Scores Between Groups

Postoperative Day	Group I (Immediate Rinse)	Group II (Delayed Rinse)	P value
Day 1	4.9 ± 1.2	3.6 ± 1.1	0.001*
Day 2	2.1 ± 0.9	1.9 ± 0.8	0.34

*Significant

Discussion

Post-extraction pain is a common and expected sequela following tooth extraction and significantly influences patient comfort and satisfaction. Various factors such as surgical trauma, inflammation, patient-related variables, and postoperative care instructions contribute to the severity of pain experienced. Among these, the role of postoperative mouth rinsing and its timing has received limited attention in the literature, despite chlorhexidine being routinely prescribed following extractions.[8-9]

In the present study, patients who initiated chlorhexidine mouth rinse immediately after tooth extraction experienced significantly higher pain levels on postoperative day 1 compared to those who delayed rinsing for 24 hours. This finding suggests that early rinsing may adversely affect the initial healing phase, primarily by disturbing the blood clot formed within the extraction socket. The blood clot plays a crucial role in protecting the underlying bone and nerve endings and serves as a scaffold for subsequent tissue healing. Disruption of this clot can lead to increased inflammation and exposure of sensitive tissues, thereby increasing postoperative pain.[10]

By postoperative day 3, pain levels in both groups showed a marked reduction, and the difference between the groups was not statistically significant. This indicates that the effect of rinse timing is most relevant during the early postoperative period, particularly within the first 24 hours. Once initial healing has progressed and the clot has stabilized, the mechanical effects of rinsing appear to have minimal influence on pain perception.

The findings of this study are consistent with the general surgical principle of avoiding mechanical disturbance of the surgical site immediately after extraction. Although chlorhexidine has proven antimicrobial benefits, its early use may counteract healing by encouraging rinsing movements at a time when clot stability is most critical. Delaying rinsing allows adequate clot maturation while still permitting the antimicrobial benefits of chlorhexidine during later stages of healing.[10]

Previous studies have focused primarily on the role of chlorhexidine in preventing alveolar osteitis rather than its influence on postoperative pain. The present study adds to the existing literature by specifically evaluating the timing of chlorhexidine use and its effect on patient-reported pain outcomes. This highlights an often-overlooked aspect of postoperative instructions that can be easily modified without additional cost or resources.[10-13]

The strengths of this study include its randomized design, standardized extraction technique, uniform postoperative analgesic prescription, and complete follow-up of all participants. These measures helped minimize bias and procedural variability. However, the study has certain limitations. The sample size was relatively small, and the follow-up period was short. Additionally, healing parameters such as clot integrity, incidence of dry socket, and soft tissue healing were not evaluated.

Despite these limitations, the study provides clinically relevant evidence supporting delayed initiation of chlorhexidine mouth rinse after tooth extraction. A simple change in postoperative instructions may significantly improve early patient comfort and enhance the healing experience.

Conclusion

Delaying the initiation of chlorhexidine mouth rinse for 24 hours after simple tooth extraction significantly reduces early postoperative pain. Immediate rinsing appears to increase discomfort during the initial healing phase, likely due to disturbance of the blood clot. A simple modification in postoperative instructions—advising patients to avoid chlorhexidine rinsing on the day of extraction—can enhance

patient comfort without compromising oral hygiene. This evidence supports delayed use of chlorhexidine as a more patient-friendly approach in routine oral surgical practice.

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