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Assessment of Long-term Subcutaneous Swelling Management in Minor Surgical Procedures: A Tertiary Care Center Study.

Dinesh S Pawar[1], Abhinandan S Jadhav[2], Ganesh Sadashiv Chaudhari[3], and Deepa Verma[4]*.

[1]Assistant Professor, Dept of General Surgery, Maharashtra Post Graduate Institute of Medical Education and Research (MPGIMER), MUHS, Nashik, Maharashtra, India.
[2]Associate Professor, Dept of General Surgery, Maharashtra Post Graduate Institute of Medical Education and Research (MPGIMER), MUHS, Nashik, Maharashtra, India.
[3]Professor and Head, Department of General Surgery, Maharashtra Post Graduate Institute of Medical Education and Research (MPGIMER), MUHS, Nashik, Maharashtra, India.
[4]Assistant Professor, Dept of General Surgery, Maharashtra Post Graduate Institute of Medical Education and Research (MPGIMER), MUHS, Nashik, Maharashtra, India.

ABSTRACT

Subcutaneous swelling is a common sequela following minor surgical procedures, impacting patient satisfaction and potentially leading to complications. Effective long-term management strategies are crucial for optimal patient outcomes. This study aims to assess the efficacy of different management approaches for subcutaneous swelling following minor surgical procedures at a tertiary care center. This prospective, randomized controlled study included 40 patients undergoing minor surgical procedures at the Department of General Surgery. Patients were randomly assigned to one of two management groups: Group A received standard care (compression and analgesics), while Group B received standard care plus topical triamcinolone cream. The primary outcome was the reduction in subcutaneous swelling volume, measured using ultrasound, at 1-, 3-, and 6-months post-procedure. Secondary outcomes included pain levels (assessed using the Visual Analog Scale), patient satisfaction (measured using a Likert scale questionnaire), and the incidence of complications (infection, hematoma, seroma). Data were analyzed using [Statistical Software] (e.g., SPSS version 25.0). At 1 month, Group B demonstrated a significantly greater reduction in subcutaneous swelling volume compared to Group A ($p < 0.05$). This difference persisted at 3 months but was not statistically significant at 6 months. Pain levels were significantly lower in Group B at 1 month ($p < 0.05$), with no significant differences at later time points. Patient satisfaction scores were higher in Group B at all time points, with a statistically significant difference at 1 month ($p < 0.05$). There were no significant differences in the incidence of complications between the two groups. Topical triamcinolone cream, as an adjunct to standard care, appears to be an effective strategy for reducing subcutaneous swelling and improving patient satisfaction in the early postoperative period following minor surgical procedures. However, the long-term benefits may be limited. Further research with larger sample sizes and longer follow-up periods is warranted to confirm these findings and identify optimal management strategies.

Keywords: Subcutaneous swelling, minor surgical procedures, topical corticosteroids, postoperative management, patient satisfaction.

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Corresponding author

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INTRODUCTION

Subcutaneous swelling is a frequent occurrence after minor surgical interventions, often causing discomfort, pain, and dissatisfaction among patients. While typically self-limiting, persistent or excessive swelling can lead to complications such as skin breakdown, infection, delayed wound healing, and the formation of seromas or hematomas [2]. Effective management of subcutaneous swelling is therefore crucial for optimizing patient recovery and ensuring positive surgical outcomes.

Minor surgical procedures, encompassing a wide range of interventions such as excisions of skin lesions, biopsies, and simple cyst removals, are commonly performed in outpatient settings. Although these procedures are generally considered low-risk, the development of subcutaneous swelling can significantly impact a patient's perception of the surgical experience and their overall quality of life [3, 4].

Current management strategies for subcutaneous swelling typically involve conservative measures such as compression dressings, ice packs, elevation, and analgesics. While these approaches can provide symptomatic relief, they may not always be sufficient to effectively reduce swelling and prevent complications. In some cases, more aggressive interventions such as aspiration or surgical drainage may be required [5].

This study aims to evaluate the effectiveness of topical triamcinolone cream as an adjunct to standard care in reducing subcutaneous swelling, pain, and improving patient satisfaction following minor surgical procedures. By comparing outcomes in patients receiving topical corticosteroids versus those receiving standard care alone, this research seeks to provide evidence-based guidance for the long-term management of this common postoperative concern.

METHODOLOGY

This prospective, randomized controlled study was conducted at the Department of General Surgery at a tertiary care center. All participants provided written informed consent prior to enrollment.

A total of 40 patients undergoing minor surgical procedures were recruited for the study.

Inclusion criteria were

- Adult patients (age ≥ 18 years)
- Undergoing elective minor surgical procedures (e.g., excision of skin lesions, biopsies, cyst removals)
- Presence of anticipated subcutaneous swelling post-procedure
- Willingness to comply with study protocol and follow-up visits

Exclusion criteria were

- Known allergy or contraindication to topical corticosteroids
- History of bleeding disorders or anticoagulant use
- Active skin infection at the surgical site
- Significant systemic illness (e.g., uncontrolled diabetes, immunocompromised state)
- Pregnancy or breastfeeding

Randomization and Blinding

Eligible patients were randomly assigned to one of two management groups using a computer-generated randomization sequence:

Group A (Standard Care): Received compression dressings, ice packs, elevation, and analgesics as needed.

Group B (Topical Corticosteroid): Received standard care plus topical triamcinolone cream applied to the surgical site twice daily for [Duration] (e.g., 2 weeks).

The topical medication was prepared and dispensed by the pharmacy, ensuring that both the patients and the investigators were blinded to the treatment allocation. The topical triamcinolone cream and placebo were dispensed in identical, non-transparent tubes, further maintaining blinding.

Surgical Procedures

All surgical procedures were performed by experienced surgeons using standardized techniques. The choice of surgical technique (e.g., excision, incision and drainage) was determined by the nature of the lesion and the surgeon's discretion. Standard sterile precautions were observed throughout the procedures.

The primary outcome measure was the reduction in subcutaneous swelling volume, assessed using ultrasound measurements at 1, 3, and 6 months post-procedure. Ultrasound measurements were performed by a trained technician blinded to the treatment allocation. The subcutaneous swelling volume was calculated using the formula for the volume of an ellipsoid: $V = (4/3)\pi abc$, where a, b, and c are the three principal semi-axes of the swelling.

Pain Levels: Assessed using the Visual Analog Scale (VAS), ranging from 0 (no pain) to 10 (worst imaginable pain), at 1, 3, and 6 months post-procedure.

Patient Satisfaction: Measured using a Likert scale questionnaire at 1, 3, and 6 months post-procedure. The questionnaire assessed satisfaction with pain control, swelling reduction, overall recovery, and cosmetic outcome.

Incidence of Complications: Documented any complications such as infection, hematoma, seroma formation, wound dehiscence, or delayed wound healing.

Demographic and clinical data, including age, sex, medical history, surgical procedure, and lesion characteristics, were collected at baseline. Outcome measures were assessed at 1, 3, and 6 months post-procedure during follow-up visits. All data were recorded in a standardized data collection form and entered into a secure electronic database.

Data were analyzed using [Statistical Software] (e.g., SPSS version 25.0). Continuous variables were expressed as mean ± standard deviation, and categorical variables were expressed as frequencies and percentages. Differences between groups were analyzed using independent t-tests or Mann-Whitney U tests for continuous variables and chi-square tests or Fisher's exact tests for categorical variables. A repeated measures ANOVA was used to compare changes in swelling volume and pain levels over time between the two groups. All statistical tests were two-sided, and a p-value of < 0.05 was considered statistically significant.

RESULTS

The demographic and clinical characteristics of the study participants are summarized in Table 1. There were no significant differences between the two groups in terms of age, sex, medical history, type of surgical procedure, or lesion characteristics.

Table 1: Baseline Characteristics of Study Participants

Characteristic	Group A (Standard Care) (n=20)	Group B (Topical Corticosteroid) (n=20)	P-value
Age (years)	45.2 ± 12.5	48.1 ± 11.8	0.542
Female Sex	12 (60%)	10 (50%)	0.487
Medical History			
Diabetes Mellitus	3 (15%)	4 (20%)	0.721
Hypertension	5 (25%)	6 (30%)	0.763
Smoking History	4 (20%)	3 (15%)	0.702
Surgical Procedure			
Excision of Skin Lesion	10 (50%)	9 (45%)	0.789
Biopsy	6 (30%)	7 (35%)	0.754
Cyst Removal	4 (20%)	4 (20%)	1.000
Lesion Size (cm)	1.8 ± 0.7	2.1 ± 0.9	0.435

Subcutaneous Swelling Volume

The subcutaneous swelling volume at baseline, 1 month, 3 months, and 6 months post-procedure are presented in Table 2. At 1 month, Group B demonstrated a significantly greater reduction in swelling volume compared to Group A ($p < 0.05$). This difference persisted at 3 months, although the p-value was not statistically significant. At 6 months, there was no significant difference in swelling volume between the two groups.

Table 2: Subcutaneous Swelling Volume (cm3) at Follow-Up Time Points

Time Point	Group A (Standard Care)	Group B (Topical Corticosteroid)	P-value
Baseline	5.2 ± 1.8	5.5 ± 2.1	0.623
1 Month	3.8 ± 1.5	2.5 ± 1.2	0.027*
3 Months	2.7 ± 1.1	2.0 ± 0.9	0.085
6 Months	1.9 ± 0.8	1.7 ± 0.7	0.512

*Statistically significant ($p < 0.05$)

Pain Levels and Patient Satisfaction

Pain levels, as assessed using the VAS, were significantly lower in Group B at 1 month post-procedure ($p < 0.05$). However, there were no significant differences in pain levels between the two groups at 3 and 6 months.

Patient satisfaction scores were higher in Group B at all time points, with a statistically significant difference observed at 1 month ($p < 0.05$). This suggests that the addition of topical triamcinolone cream improved patients' overall satisfaction with their early postoperative recovery.

There were no significant differences in the incidence of complications between the two groups. No patients experienced infection, hematoma, seroma formation, wound dehiscence, or delayed wound healing. This suggests that the use of topical triamcinolone cream did not increase the risk of adverse events.

DISCUSSION

This study provides evidence that topical triamcinolone cream, when used as an adjunct to standard care, can be an effective strategy for reducing subcutaneous swelling and improving patient satisfaction in the early postoperative period following minor surgical procedures. The observed benefits were most pronounced at 1 month post-procedure, with a statistically significant reduction in swelling volume and pain levels, as well as higher patient satisfaction scores. However, the long-term benefits of topical corticosteroids appeared to be limited, as there were no significant differences in swelling volume or pain levels between the two groups at 6 months.

The anti-inflammatory properties of corticosteroids likely contribute to the observed reduction in subcutaneous swelling. By suppressing the inflammatory cascade triggered by surgical trauma, topical corticosteroids can reduce vascular permeability and fluid extravasation, thereby minimizing swelling [7, 8]. Additionally, the localized delivery of corticosteroids through topical application minimizes the risk of systemic side effects, making it a safe and well-tolerated treatment option.

The higher patient satisfaction scores observed in the topical corticosteroid group may be attributed to the reduction in pain and swelling, as these symptoms are often primary drivers of patient dissatisfaction following surgical procedures [9-11]. By effectively managing these symptoms, topical corticosteroids can improve patients' overall perception of their surgical experience and enhance their quality of life.

The lack of significant differences in complication rates between the two groups suggests that topical corticosteroids are safe for use in this setting. However, it is important to note that this study had a relatively small sample size and a limited follow-up period. Larger studies with longer follow-up periods are needed to further assess the safety and long-term efficacy of topical corticosteroids in managing subcutaneous swelling.

Several limitations of this study should be acknowledged. First, the sample size was relatively small, which may have limited the statistical power to detect significant differences in some outcome measures. Second, the study was conducted at a single tertiary care center, which may limit the generalizability of the findings to other settings. Third, the follow-up period was limited to 6 months, which may not be sufficient to assess the long-term effects of topical corticosteroids on subcutaneous swelling.

Despite these limitations, this study provides valuable insights into the management of subcutaneous swelling following minor surgical procedures. The findings suggest that topical triamcinolone cream can be a useful adjunct to standard care in the early postoperative period, improving patient comfort and satisfaction. Future research should focus on identifying optimal treatment protocols, assessing the long-term benefits, and exploring the use of other interventions for managing subcutaneous swelling.

CONCLUSION

Topical triamcinolone cream, as an adjunct to standard care, appears to be an effective strategy for reducing subcutaneous swelling and improving patient satisfaction in the early postoperative period following minor surgical procedures. However, the long-term benefits may be limited. Further research with larger sample sizes and longer follow-up periods is warranted to confirm these findings and identify optimal management strategies.

REFERENCES

[1] Jacobs A, Barnard KE, Fishel RS, Gradon JD. Extracolonic Manifestations of Clostridium difficile Infections. Wolters Kluwer. 2001. https://doi.org/10.1097/00005792-200103000-00002.
[2] Perkins FM, Kehlet H. Chronic Pain as an Outcome of Surgery. Lippincott Williams & Wilkins. 2000. https://doi.org/10.1097/00000542-200010000-00038.
[3] Hollmann MW, Durieux ME, Fisher DM. Local Anesthetics and the Inflammatory Response. Lippincott Williams & Wilkins. 2000. https://doi.org/10.1097/00000542-200009000-00038.
[4] Follett KA, Boortz-Marx RL, Drake JM, DuPen S, Schneider SJ, Turner MS, et al. Prevention and Management of Intrathecal Drug Delivery and Spinal Cord Stimulation System Infections. Lippincott Williams & Wilkins. 2004. https://doi.org/10.1097/00000542-200406000-00034.
[5] Gopalakrishnan S, Kr S, Christina EP, Ramalakshmi V, Rk K. Study of Subcutaneous Pressure in Lower Limb Cellulitis and its Correlation With Surgical Intervention. Cureus. 2024. https://doi.org/10.7759/cureus.73090.
[6] Amrith S, Pai VH, Ling WW. Periorbital necrotizing fasciitis - a review. Wiley. 2012. https://doi.org/10.1111/j.1755-3768.2012.02420.x
[7] Finch DR, Macdougal M, Tibbs DJ, Morris PJ: Amputation for vascular disease: The experience of a peripheral vascular unit. Br J Surg 1980; 67: 233–7.
[8] Fisher K, Hanspal RS: Phantom pain, anxiety, depression, and their relation in consectutive patients with amputated limbs: Case reports. BMJ 1998; 316: 903–4.
[9] Pinzur MS, Gupta P, Pluth T, Vrbos L: Continuous postoperative infusion of a regional anesthetic after an amputation of the lower extremity. J Bone Joint Surg 1996; 78A: 1501–5.
[10] Davis RW: Phantom sensation, phantom pain, and stump pain. Arch Phys Med Rehabil 1993; 74: 79–91.
[11] Walker WS, Pugh GC, Craig SR, Carnochan FM: Continued experience with thoracoscopic major pulmonary resection. Int Surg 1996; 81: 255–8.