

Original Research Article

Early versus delayed dressing removal after primary closure of clean and clean contaminated wounds: an observational study

Nandan M. P.*, Darshan A. M., Poorna Prasad

Department of General Surgery, SIMS, Shivamogga, Karnataka, India

Received: 18 May 2024

Revised: 17 June 2024

Accepted: 01 June 2024

*Correspondence:

Dr. Nandan M. P.,

E-mail: nandanmagadi@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Traditionally, surgical dressings have remained untouched for several days after surgery. However, recent research is exploring the potential benefits of removing dressings sooner. Early removal may offer advantages like quicker detection of infection and improved patient comfort, but it's crucial to determine if it affects healing rates or patient satisfaction compared to the traditional delayed approach.

Methods: A year-long cohort study investigated the efficacy of early (within 48 hours) versus delayed dressing removal 150 post-surgical patients who were divided into two respective groups. Data analysis was performed using statistical software.

Results: Early and delayed dressing removal showed no significant difference in wound complications (p-values > 0.05 for both Chi-square and t-tests). However, patient satisfaction was lower in the early removal group (97 dissatisfied vs 143 satisfied in delayed removal). While the study found no objective benefit to delayed removal, it suggests patients were less satisfied with early removal.

Conclusions: Although there were no statistically significant results between the early and delayed removal of dressing, early removal of dressing had the advantage of cost effectiveness, early detection of wound infection and decreased duration of hospital stay in patients.

Keywords: Early dressing removal, Operative dressing removal, Post operative wound care, Wound dressing, Surgical site infection

INTRODUCTION

Many surgeries require a skin incision to access deeper areas. Typically, these incisions are fully closed with stitches at the end of the procedure (primary closure).¹ Following surgery, the closed wound is covered with a dressing or tape. This dressing serves several purposes: it acts as a shield for the wound until the skin heals over (around 48 hours), absorbs any fluids the wound produces (exudate), and helps maintain a clean and dry environment to prevent bacteria from entering.² Clean wound: operative incisional wounds that follow non penetrating trauma. Clean contaminated wound:

uninfected wounds in which no inflammation is encountered but the respiratory, gastrointestinal, and genitourinary tracts have entered.

Contaminated wound: Open traumatic wounds or surgical wounds involving a major break in sterile techniques that show evidence of inflammation.

Infected wound: Old traumatic wound containing dead tissue and wounds with evidence of clinical infection. Objectives are surgical site infection within 30 days of operation, wound dehiscence within 30 days of operation, patient satisfaction, cost of dressing.

METHODS

Study size

Considering surgical site infection on post-operative day 10, with 80% power and 5% alpha error, the minimum sample size was calculated as 146, on expecting some attrition of 10% sample size 150 is taken for each group. Considering two study groups total sample size is 300.

Place of study

Department of General Surgery, Mc Gann Teaching District Hospital, attached to Shimogga Institute of Medical Sciences.

Duration of study

Duration of the study included 12 months. (one year of data collection from September 2022 to august 2023).

Ethical approval

This study was an observational study. The Institutional Ethics Committee has confirmed that no ethical approval was required.

Inclusion criteria

Patients of all age group with primary closure of clean and clean contaminated wounds.

Exclusion criteria

Patients with wound healing by secondary intention and dirty wounds.

Data assessment

Wound assessment done on post op day 10 and 30. Southampton wound infection grading system was used to assess surgical site infection. Wound dehiscence was assessed with presence or absence. Patient satisfaction was assessed with yes or no questions. The cost of dressing was assessed in Indian rupees, considering 30 rupees for a single dressing. Data analysis software: data tab software.

RESULTS

Hypothesis assumed for surgical site infections.

Null hypothesis

There is no difference between the early and delayed groups with respect to the dependent variable SSI grade.

Alternate hypothesis

There is difference between the early and delayed groups with respect to the dependent variable SSI grade.

Table 1: Demographic details of the patients.

Variables		
Patient age (years)	<40	72
	40-60	134
	>60	94
Sex	Male	128
	Female	72

Wound infection

Descriptive statistics

The results of the descriptive statistics showed that the early group had higher values for the dependent variable SSI grade (M=0.34, SD=0.76) than the delayed group (M=0.29, SD=0.74).

t-test for independent samples

A two-tailed t-test for independent samples (equal variances assumed) showed that the difference between early and delayed SSI with respect to the dependent variable SSI grade was not statistically significant, $t(298) = 0.54$, $p = 0.589$, 95% confidence interval $[-0.12, 0.22]$. Thus, the null hypothesis is retained.

Wound dehiscence

A Chi² test was performed between early or delayed dressing removal and wound dehiscence. At least one of the expected cell frequencies is less than 5. Therefore, the assumptions for the Chi² test were not met. There was no statistically significant relationship between early or delayed dressing removal and wound dehiscence, $\chi^2(1) = 0.68$, $p = .409$, Cramer's V = 0.05. The calculated p-value of .409 was above the defined significance level of 5%. The Chi² test was not significant and the null hypothesis was not rejected.

Table 2: Number of wound dehiscence in each group.

Wound dehiscence	Absent	Present	Total
Early	148	2	150
Delayed	146	4	150
Total	294	6	300

Patient satisfaction

A Chi² test was performed to compare early or delayed dressing removal and patient satisfaction. All expected cell frequencies were greater than 5, thus the assumptions for the Chi² test were met. There was a statistically significant relationship between early or delayed dressing removal and patient satisfaction, $\chi^2(1) = 96.54$, $p < 0.001$, Cramer's V = 0.57. The calculated p-value of <.001 was lower than the defined significance level of 5%. The Chi²

test was therefore significant and the null hypothesis was rejected.

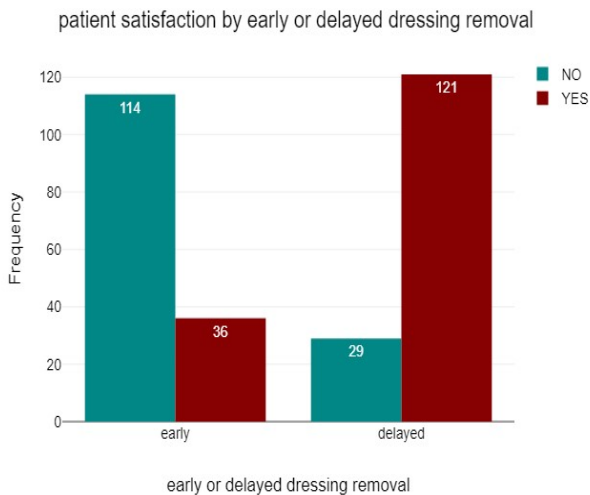


Figure 1: Depicting patient satisfaction in each group.

Cost of dressing

A Chi² test was performed to compare early and delayed dressing removal and cost. At least one of the expected cell frequencies is less than 5. Therefore, the assumptions for the Chi² test were not met. There was a statistically significant relationship between early or delayed dressing removal and cost, $\chi^2 (5)=293.48$, $p \leq 0.001$, Cramer's V=0.99. The calculated p value of <.001 was lower than the defined significance level of 5%. The Chi² test was therefore significant and the null hypothesis was rejected.

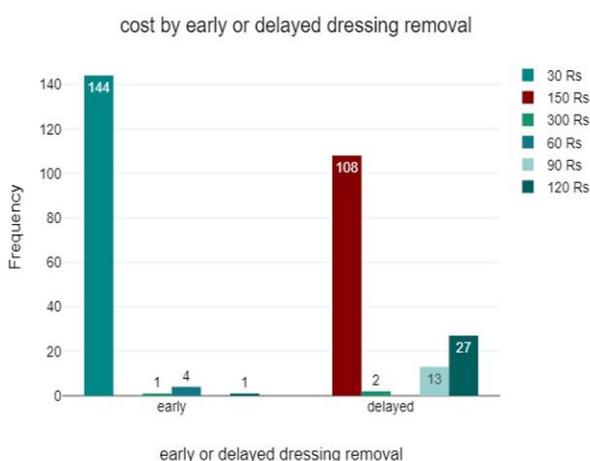


Figure 2: Cost of dressing in each group.

DISCUSSION

Following surgery, wound dressings have two options: early removal or staying on until suture removal.³ Wound dressings shield the injury until epithelization, which usually happens within 48 hours of surgery and absorb any drainage (exudate) from the wound, maintaining a

dry and clean environment to minimize the risk of bacterial infection from the external environment.^{4,6} Additionally, dressings act as a barrier, preventing wound drainage from reaching and potentially irritating the surrounding healthy skin. Though mainly used for potentially infected wounds, some dressings may even help wounds heal faster by keeping them moist.⁷ While some dressings promote healing through moisture, it's important to note that excessive wound fluid (exudate) can lead to maceration, which is the softening and breakdown of the wound and surrounding healthy tissue.⁹ Surgeons aim for dressings that promote infection-free, toxin-free healing with minimal slough, at optimal temperature and pH, requiring infrequent changes. Different dressings may be needed throughout wound healing to best support the healing process.⁷

CONCLUSION

This study investigated the impact of early dressing removal (within 48 hours) compared to delayed removal on post-surgical outcomes. While there was not a significant difference in wound healing or infection rates, early removal did significantly reduce dressing costs, potentially benefiting resource-limited facilities. Notably, patients, particularly those from rural or semi-urban areas, expressed initial dissatisfaction with early removal but were ultimately happy with the healing results. This study highlights the potential benefits of early removal for cost reduction, but also identifies the need for patient education to improve satisfaction. Additionally, early removal offers the advantage of earlier detection of infection or wound complications, allowing for prompt intervention. Despite limitations such as patient diversity, this study contributes to the understanding of early dressing removal as a potentially safe and cost-effective approach especially in resource deficit settings.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Garcia CF, Colon RL, Bond MC. Essential concepts of wound management. *Emerg Med Clin of North America*. 2010;28(4):951-67.
2. Toon CD, Lusuku C, Ramamurthy R, Davidson BR, Gurusamy KS. Early versus delayed dressing removal after primary closure of clean and clean-contaminated surgical wounds. *Cochrane Database Syst Rev*. 2015;(9):10259.
3. Zhang T, Zhang F, Chen Z. Removal of dressing following surgical wounds. *Exp Ther Med*. 2020;19:3219-26.
4. Lawrence WT. Physiology of the acute wound. *Clinics in Plastic Surgery*. 1998;25(3):321-40.
5. Bailey and love's basic principles of surgery 28th edition.

6. British Medical Association and the Royal Pharmaceutical Society of Great Britain. Br National Formulary. BMJ. 2011;1.
7. Hutchinson JJ, Lawrence JC. Wound infection under occlusive dressings. JHI. 1991;17(2):83-94.
8. Downie F, Egdell S, Bielby A, Searle R. Barrier dressings in surgical site infection prevention strategies. BJN. 2010;19(20):42-6.
9. Lawrence WT. Physiology of the acute wound. Clin Plastic Surg. 1998;25(3):321-40.
10. Cutting KF, White RJ. Maceration of the skin and wound bed. 1: Its nature and causes. J Wound Care. 2002;11(7):275-8.
11. Dyson M, Young S, Pendle CL, Webster DF, Lang SM. Comparison of the effects of moist and dry conditions on dermal repair. JID. 1988;91(5):434-9.

Cite this article as: Nandan MP, Darshan AM, Prasad P. Early versus delayed dressing removal after primary closure of clean and clean contaminated wounds: an observational study. *Int Surg J* 2024;11:1288-91.