



## Surgery

## COMPARATIVE STUDY OF EARLY VERSUS LATE INSPECTION OF SURGICAL WOUNDS IN CLEAN AND CLEAN CONTAMINATED SURGICAL WOUNDS

**Dr. R.G Naniwadekar**

Professor, Department of general surgery Krishna Institute of medical Sciences Deemed To Be University, Karad, Maharashtra

**Dr. Shivam H Thakkar\***

Resident, Department of general surgery Krishna Institute of medical Sciences Deemed To Be University, Karad, Maharashtra. \*Corresponding Author

**ABSTRACT** Few surgeons remove the dressing routinely after 48 hours and remaining do not. This study is undertaken to see if there is any benefit in inspecting the wound early and whether original dressing should be removed at the time of suture removal. Currently there are no guidelines about the timing of surgical wound inspection after surgery. This study was done to compare the advantages and disadvantages of early versus late inspection of clean and clean contaminated surgical wounds. There is no benefit in inspecting clean and clean contaminated surgical wounds early except indicated.

**KEYWORDS :** surgical wounds, dressing

### INTRODUCTION

A large number of people undergo elective surgery during their lifetime. After surgery, surgical wounds are closed with primary closure and covered by a sterile dressing at the end of the surgical procedure. The opinion as to whether surgical wound should be inspected after 48 hours or not is divided: Few surgeons remove the dressing routinely after 48 hours and remaining do not. This study is undertaken to see if there is any benefit in inspecting the wound early and whether original dressing should be removed at the time of suture removal. Currently there are no guidelines about the timing of surgical wound inspection after surgery. This study is to establish guidelines for inspection of clean and clean contaminated surgical wounds after primary closure.

#### The purpose of dressing is:

- to protect the wound until the continuity of the skin (epithelialisation) occurs in about 48 hours (Lawrence 1998)
- to absorb exudate from the wound
- avoiding bacterial contamination from the external environment (Hutchinson 1991; Mertz 1985; Ubbink 2008)
- to reduce pain due to movement of suture
- to prevent contamination of the immediate proximity by any wound discharge

Some studies have found that the moist environment created by some dressings accelerates wound healing (Dyson 1988), although others believe that the moist environment created by dressing is a disadvantage as excessive exudate can cause maceration of the wound and the surrounding healthy tissue (Cutting 2002). Ideally dressings are chosen to ensure that the wound remains:

- Moist with exudate, but not macerated;
- Free of clinical infection and excessive slough
- Free of toxic chemicals, particles or fibers;
- At the optimum temperature of healing;
- Undisturbed by the need of frequent changes;
- At the optimum pH value.

#### Classification of surgical wounds:

Table 1
Surgical Wound Classification Grades (I-IV) as Defined by the CDC
CDC Surgical Wound Classification Definitions
<i>Class I/Clean:</i> An uninfected operative wound in which no inflammation is encountered, and the respiratory, alimentary, genital, or uninfected urinary tract is not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow no penetrating (blunt) trauma should be included in this category if they meet the criteria.
<i>Class II/Clean-Contaminated:</i> An operative wound in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in a sterile technique is encountered.
<i>Class III/Contaminated:</i> Open, fresh, accidental wounds. In addition, operations with major breaks in a sterile technique (eg, open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute or no purulent inflammation is encountered are included in this category.
<i>Class IV/Dirty-Infected:</i> Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

CDC = Centers for Disease Control and Prevention.

Examples of Clean (class I) and Clean Contaminated (class II) include: Hernia repair, elective cholecystectomy, elective appendicectomy, Thyroid surgeries, stricturoplasty.

#### Indications of early inspection of dressing:

- soakage over dressing
- pain disproportionate to the surgical wound
- fever

#### Advantages of Late inspection of dressings:

- Allows epithelialization faster due to undisturbed healing environment
- Maintains aseptic environment
- skin remains approximated which causes early epithelialization
- No pain of removal of dressing

#### Disadvantages of early inspection of dressing:

- Increases chances of contact of surgical wound to environment, that causes contamination of wound (original dressing is done in an operation theatre under all aseptic precautions).
- Early removal of dressing has significantly higher chances of SSI.
- There are high chances of skin discontinuity in early removal of dressings and disruption of wound edges
- Disturbs the healing environment
- Itching and pain at local site due to removal of dressing
- Excoriation of skin at the site of sticking or dynaplast

This study was done to compare the advantages and disadvantages of early versus late inspection of clean and clean contaminated surgical wounds.

#### AIM:

To compare the advantages and disadvantages of early versus late inspection of surgical wounds in clean and clean contaminated surgical wounds.

#### Objective:

To evaluate advantages and disadvantages of inspection of closed surgical site incision within 48 hours (Early) and at the time of suture removal (Late) in clean and clean contaminated surgical wounds

#### METHODOLOGY:

##### Study design:

The study was designed as single center, prospective study. It was conducted for 6 months in tertiary care center Krishna Hospital, Karad. Institutional ethical committee approval and informed consent was obtained. Entire information recorded was kept confidential and patient was given full right to quit from study at anytime.

##### Study patients:

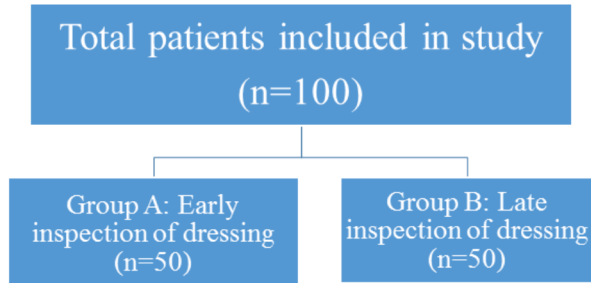
All patients admitted in Krishna hospital, Karad undergoing surgery which are included in clean (class I) and clean contaminated (Class II) surgical wounds closed primarily were included in the study. Those patients having Contaminated and dirty wounds were excluded from the study. Those patients having immunocompromised status e.g HIV,

Post chemotherapy or radiotherapy, on steroids, malignancy or having Diabetes Mellitus were excluded from the study. Two groups were made as Group A- Early dressing inspection and Group B- Late dressing inspection. Patients were selected randomly to be included in group A or group B

**Sample Size:**

A total of 100 patients following inclusion criteria were included in the study. 50 patients each were assigned to each groups.

**Study groups:**



**Group A: Early inspection of dressing**

After the surgical procedure, in both clean and clean contaminated surgical wounds, sterile dressing was done in an operation theatre in sterile environment. After closure, surgical wound was cleaned with betadine, followed by spirit and was covered by sterile gauze piece. Water proof adhesive bandage or dynaplast was applied over the wound. Perioperative antibiotics were continued. The dressings were opened within 48 hours of surgery, surgical wounds were inspected and dressing was changed daily. Sutures were removed after 7 days of surgery or as indicated. The day of first sign of epithelialization was noted. Other parameters were also observed and recorded.

**Group B: Late inspection of dressings**

Similar in group of late inspection of dressing, wound was covered with sterile dressing in sterile Operation theatre environment and was inspected directly on day of suture removal (7 days or later as indicated). Similar parameters were assessed as in group A.

**Parameters assessed:**

Primary outcome parameters assessed were number of days required for healing by primary intention or secondary intention, length of hospital stay, pain and discomfort while changing dressing, disruption of wound edges and additional cost. Healing by primary intention was defined as complete healing (without SSI) with healthy scar at the end of 15 day. Healing by secondary intention was defined as complete coverage of contracted wound surface with flat healthy granulation tissue at the end of one month

**RESULTS:**

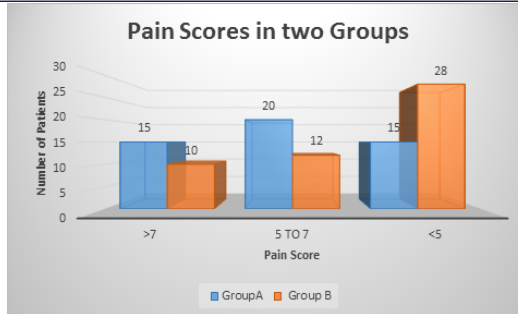
From the parameters assessed in group A and group B results were as follows:

**Table 1: Study Parameters**

Sr	Parameters		Group A – Early (n=50)	Group B – Late (n=50)	P Value
1	Pain and discomfort	>7	15 (30%)	10 (20%)	0.031 (S)
		5 -7	20 (40%)	12 (44%)	
		<5	15 (30%)	28 (36%)	
2	Length of hospital stay	Days	9.5 ± 3.6	3.9 ± 1.5	< 0.001 (S)
3	Increase in cost	%	22%	-	-

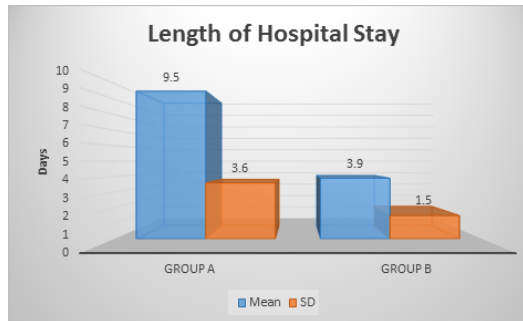
S - Significant

The pain scores of group A and group B patients showed statistical difference (p = 0.031). The pain scores seen in group A patients of score > 7 had 15 patients (30%), score 5 – 7 had 20 patients (40%) and score less than 5 had 15 patients (30%). While the group B patients had 10 patients with scores more than 7 (20%), 12 patients (24%) had scores 5 to 7, 28 patients (56%) less than 5. Showing that the group B patients had less pain scores as compared to Group A patients, this is due to the early inspection of dressings and daily dressing there after done in Group A.



**Fig 1: Pain Scores in two Groups**

Group B patients were discharged early (3.9 ± 1.5 days) as compared to Group A patients (9.5 ± 3.6). There was significant difference between the mean duration of discharge after the procedure (p < 0.001), the patients in group A had to stay longer because of the repeated dressings which were done daily. While the group B patients were done the dressing after they were called for suture removal. This also increased the costs of hospital stay and repeated dressings in group A patients, they paid almost 22% more cost on an average as compared to group B patients.



**Fig 2: Length of Hospital Stay**

In group B, we had one patient whose dressing we had to remove early because of soakage.

**DISCUSSION:**

- The pain scores of group A and group B patients showed statistical difference (p=0.031).
- The pain scores seen in group A patients of score > 7 had 15 patients (30%), score 5 – 7 had 20 patients (40%) and score less than 5 had 15 patients (30%).
- -While the group B patients had 10 patients with scores more than 7 (20%), 12 patients (24%) had scores 5 to 7, 28 patients (56%) less than 5.
- Showing that the group B patients had less pain scores as compared to Group A patients, this is due to the early inspection of dressings and daily dressing there after done in Group A.
- In a study by **CD Toon et al** [1], they observed that the pain and discomfort in patients with late suture removal was lesser than in the patients who underwent early suture removal
- Group B patients were discharged early (3.9 ± 1.5 days) as compared to group A patients (9.5 ± 3.6).
- -There was significant difference between the mean duration of discharge after the procedure (p < 0.001), the patients in group A had to stay longer because of the repeated dressings which were done daily.
- While the group B patients were done the dressing after they were called for suture removal.
- This also increased the costs of hospital stay and repeated dressings in group A patients, they paid almost 22% more cost on an average as compared to group B patients.
- In a similar study by **C Vijaykumar et al** [6], fifty patients aged ≥18 years who were admitted and operated for surgical procedures (both emergency and elective) were included. Twenty-five patients each were included in early dressing removal group and the late removal group. They found that the early removal of the sutures caused increased length of the stay and increased costs in the patients similar to our study. They recommended early removal of the sutures only if required.

- In group B, we had one patient whose dressing we had to remove early because of soakage.
- **Lisy K et al** [2] suggested to do the early removal of sutures only if there is an indication otherwise the conventional late removal of the sutures should be followed.
- Many other studies have similar opinions to follow the late inspection of surgical wounds at the time of suture removal like our study. [7,8,9]

## CONCLUSION

Our study concludes that there was no any added benefit in inspecting clean and clean contaminated surgical wounds early except indicated. Inspection of clean and clean contaminated surgical wounds early causes interruption in healing environment, disruption of edges, pain and discomfort to the patient. Larger metacentric studies should be carried out to evaluate the difference between the two techniques.

**Conflict of Interest:** None

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