

## A Study of Laparotomy Wound Closure With Skin Staples

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**Abstract:** Laparotomy is one of the common surgeries performed in general surgery. This study compares and analyses two commonly used materials for skin closure after laparotomy which are skin staples and sutures. Patients who underwent midline laparotomy in both elective and emergency situations were selected. They were equally segregated into two study. In one arm the laparotomy wound was closed with silk mattress suture while in other arm skin staples were used. Both the groups were compared regarding reduction in surgery time, effect of wound healing, infection rate, post operative pain, and cosmesis. Data was collected and analysed by various statistical methods. Using skin staples for closure of laparotomy wounds significantly reduced operative time with less post op pain with no difference in appearance or rate of infection when compared to closure by sutures

**Keywords-:** Laparotomy, Skin staples, Suture, Infection, Time

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### I. Introduction

The principle aims of tissue repair of surgical skin incisions are rapid acquisition of strength and minimum tissue damage with minimum inflammation and a good scar. Many factors including the choice of suture materials and its placements influence these aims. But of particular relevance is the accurate co-aptation of dermal edges; eversion or inversion leads to sub optimal healing. For many years it has been possible to approximate the skin edges using sutures. However, sutures have the disadvantages of consuming more time in applying with a cosmetically inferior scar. The use of automatic stapling device for skin closure has become more popular of late to overcome these disadvantages[1]. At the present time cost effectiveness of these is debatable[2].

### II. Aim and objective

To study the operative time required for suture and staple repairs. To study the effect on wound healing and complications with the use of sutures and staples. To study the cosmetic results of these two techniques. To study the degree of post operative pain and patients acceptance with these two techniques[3].

### III. Materials And Methods

The present study is a prospective study consists of 100 cases admitted in government rajaji hospital, attached to Madurai Medical College, madurai during the study from September 2013 to August 2014. 60 cases for the purpose of the study were selected randomly to receive either staples or conventional sutures for abdominal skin wound closures.

#### 3.1 Inclusion criteria

All patients admitted in general surgery who had under gone laparotomy.

#### 3.2 Exclusion criteria

Children under 13 years will be excluded from this study. Patients who are not willing to be a part of this study will be excluded.

#### 3.3 Methodology

Clinical study will be through questionnaires and clinical examination. Post operative observation of patients. Regular follow up of patients

#### 3.4 Data analysis

Using statistical analysis. The methods of skin closure for each case was determined after repair of the deeper layers, by the next sequence number from a randomization . The process of closure was timed in

minutes, the length of the wound was measured and the number of staples or number of suture packs used was recorded.

Staples or sutures were placed by surgeon preference. Staples were removed with a device that painlessly opened them sideways, while sutures were removed in the conventional way. Wound closures were generally removed at ten days and the ease or difficulty of removal was recorded. Pain attributable to the skin closure was assessed as either present or absent at each stage. The cosmetic appearance was assessed 'blind' at thirty days.

#### **IV. Results**

The following study was conducted at Govt. Rajaji hospital which is the hospital attached to Madurai medical college. A total of 60 patients participated in this study. Patient selection was such that we included only the patients undergoing laparotomy in our unit. Of the 60 cases 30 were undergoing laparotomy as an elective surgery as in gastrectomy for cancer stomach or abdominoperineal resection for cancer rectum etc. other 30 cases were those who underwent laparotomy as an emergency surgery like bowel perforation or abdominal trauma.[4] Of these 60 patients only 4 were under the age group of less than 20. There were 17 patients in the age group of 20 to 40 of which 7 underwent suture closure whereas 10 underwent stapler closure. There were 30 patients in the age group of 40 to 60 of which 16 underwent suture closure and 14 underwent stapler closure. There were 9 patients in the age group above 60 of which 3 underwent suture closure and 6 underwent stapler closure[5]. The length of the laparotomy incisions varied and of the 60 cases only one of the case was less than 15 cm which was closed by staples, 20 cases the length was 20 cms of which 12 cases were closed by suture and 8 cases closed by stapler. In another 20 cases the length of the incision was 25 cms of which 10 was closed by suture and remaining 10 was closed by stapler. The remaining 19 cases were of 30 cms length which were mostly in emergency. Of 19 such cases 8 were closed by suture and remaining 11 was closed by staplers. The number of suture material or stapler required to close the wound was measured. Among the cases less than 15 bites were necessary for about 14 cases closed by suture and one case closed by stapler. About 16 to 20 bites were necessary among 8 of the cases closed by suture and 13 of the cases closed by staplers. More than 20 bites were needed among 8 of the cases using suture and 16 of the cases using staplers. The suture needed every bite approximately 1.8 cm after the previous bite whereas in case of stapler it was approximately 1.2 cm.

This was statistically significant with p value of 0.006 with more bites needed for closing a given length of wound using stapler rather than a suture. The time needed to close the given wound was calculated of which 17 of cases closed with staplers were completed within 5 min whereas no case closed with suture was completed in that time. 13 cases closed with stapler required 6 to 10 min whereas 5 cases closed with suture was unable to complete in that time. About 15 cases closed with suture required 11 to 15 min to complete whereas 10 cases closed with suture required 16 to 20 min to close. In contrast no case closed with stapler required more than 10 min and this was statistically significant proving closure of skin with staples reduces the operative time by more than one fourth. Regarding the appearance of scar about 18 cases closed with suture and 23 cases closed with stapler were good in appearance after one month follow up. About 13 of cases closed with suture and 7 of the cases closed with stapler had fair to poor wound after one month with widening or hypertrophy of scar with itching. Of particular note is that 6 of 13 cases in suture group needed resuturing and 5 of 7 cases in stapler group needed resuturing and all those 11 cases were cases who underwent emergency laparotomy.

Among the suture group 9 cases were infected in the post op period leading to seroma or hematoma or frank pus whereas 6 cases in stapler group were infected and majority of these cases were from emergency laparotomy[6]. However these were not statistically significant and there was no difference in the rate of infection between the two groups. The pain in the wound site during immediate post op and during removal of suture or stapler was statistically significant. Pain score was based on linear verbal analog score. Among suture group 10 patients had pain score between 1 and 3 whereas all 30 cases in stapler cases fell into pain score 1 and 20 cases of suture group had a pain score between 3 and 4 whereas no case from stapler group had pain score above 3[3] and this was statistically significant with a p value less than 0.001. Apart from the more efficient use of theatre time, the psychological effect of rapid wound closure at the end of a long operation on surgeon and theatre staff was very evident during this trial.

#### **V. Conclusion**

60 patients admitted for elective and emergency laparotomy were divided into two equal groups wherein one group skin closure was done by silk suture whereas in other group skin closure was done by staples. The age group of the patients was between 17 and 77 years. There were 45 males and 15 females in the

study. The length of the incision varied from 15 to 30 cm. For a given length of incision stapler needed more bites (once in 1.2cm) when compared to suture(once in 1.8 cm).

There was no difference in appearance of scar between both groups. There was no difference in rate of infection between both groups. The time saved during wound closure was significantly reduced when using skin stapler than suture. It was observed that it reduced the closing time more than half when compared to sutures . The immediate post op pain and pain during removal of suture or stapler were considerably less in staples group with patient acceptance being better in staples group.Thus this study concludes that using skin staples for closure of laparotomy wounds significantly reduced operative time with less post op pain with no difference in appearance or rate of infection when compared to closure by sutures.

### **References**

- [1]. Eldrup J, Wied U, Anderson B. Randomised trial comparing Proximate stapler with conventional skin closure. *ActaChirurgScand* 1981; 147:501-502.
- [2]. Brickman KR, Lambert RW. Evaluation of skin stapling for wound closure in the emergency department, *Ann Emerg Med*1989 Oct;18(10): 1122-1125
- [3]. Huskisson EC. Measurement of pain.*Lancet* 1974;iii: 112731.
- [4]. Ranaboldo CJ, Rowe-Jones DC. Closure of laparotomy wounds: skin staples versus sutures. *Br.J.Surg.*1992; 79:1172-1173.
- [5]. Harvey CF , Logan J. A prospective trial of skin staples and sutures in skin closure. *Ir J Med Sci.*1986; 155:194-196.  
Burke JF, Infection, in Hunt TK, Dunphy JE (eds) *Fundamentals of wound Management.*(New York, Appleton – Century – Crofts, 1979), pp 170-241.

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