

**Research Article**

## COMPARISON BETWEEN SUTURING AND NON-SUTURING OF SUBCUTANEOUS TISSUE IN ELECTIVE ABDOMINAL SURGERIES

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### ABSTRACT

The aim of this study was to see the effect of non-suturing of subcutaneous fat tissue in elective abdominal surgeries and to compare the results of suturing and non-suturing of subcutaneous fat tissue in elective abdominal surgeries. 100 patients were admitted in SGRD Amritsar for elective abdominal surgery. The patients were divided into two basic groups, Group A: clean contaminated surgery with subcutaneous suturing (n=50) and Group B: clean contaminated surgery without subcutaneous suturing (n = 50). Wounds were checked on postoperative days 3, 7, 14, and 30. Infectious and non-infectious wound complications were charted in the records. Data were statistically analysed. There were no statistically significant differences in infectious and non-infectious wound complications. These results suggest that omission of subcutaneous fat tissue suturing does not increase the occurrence of infectious or non-infectious wound complications. Omitting subcutaneous suturing can globally also lead to a significant saving of cost of suture material and will shorten the time of surgery.

**Keywords:** *Subcutaneous Fat Tissue, Subcutaneous Suturing, Suture Material, Wound Healing, Complications, Abdominal Surgery*

### INTRODUCTION

Suturing of subcutaneous fat tissue during surgical wound closure after abdominal surgery still remains a problem of discussion. The classical surgical school insists on accurate closure of the fat layer, the rationale being that this will prevent the creation of dead space, decrease the risk of subcutaneous bleeding, and improve the adaptation of wound edges. Opposition to suturing of the fat layer derives from the knowledge that suturing of fragile fat tissue is imperfect and that the suture material further deteriorates generally poor fat perfusion and may increase the rate of postoperative complications. Furthermore, as an extraneous material, sutures may provide a focus for bacterial contamination and wound infection.

The aim of this study was to investigate the necessity of suturing of subcutaneous fat tissue in elective abdominal surgery. We hypothesized that omission of subcutaneous fat tissue suturing would not increase the risk of wound complications.

### MATERIALS AND METHODS

This study included 100 patients who were admitted in the department of Surgery, at Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar during the period of December 2012 to February 2014 for elective abdominal surgeries.

The patients were chosen randomly, irrespective of their age, sex and nature of disease. Out of 100 patients, 50 patients each were divided into two basic groups: **Group A:** clean contaminated surgery with subcutaneous suturing (n = 50). Interrupted sutures of absorbable synthetic polyglactin were used to suture subcutaneous fat tissue and **Group B:** clean contaminated surgery without subcutaneous suturing (n = 50).

Patients with Haematological disorders, Long-term anticoagulation therapy, Hemocoagulation disorders, Malignancy, Diabetes mellitus, Septicaemia, Patients with age < 10 years old and > 70 years old, Patients on chemotherapy or radiotherapy were excluded.

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A standard medical history was taken, and risk factors that might affect wound healing were recorded in patients' records. Wounds were checked on postoperative days 3, 7 and on follow up on 14<sup>th</sup> and 30<sup>th</sup> day. The sutures were removed between 8th to 12th days in both the groups. Monitoring for infectious and non-infectious wound complications was focused on the presence or absence of seroma, hematoma, infection, wound dehiscence, burst abdomen and eversion of wound edges. The variables were compared and results so obtained were analysed using SPSS version 15 and level of significance was determined as its p value, with  $p < 0.05$  taken as statistically significant. Various possible level of significance were  $p > 0.05$  - non significant and  $p < 0.05$  - significant.

**RESULTS AND DISCUSSION****Results**

In our study, incidence rate of different diseases is as followed in suture group, 34% patients were of cholelithiasis, 24% patients were of umbilical hernia, 12% patients of ovarian mass, 8% patients of renal calculi, 4% patients of intestinal obstruction, 2% patients of hydatid cyst and 16% of other diseases. In non-suture group, 54% patients were of Cholelithiasis, 6% patients of renal calculi, 4% patients of umbilical hernia, ovarian mass, intestinal obstruction and CA rectum each (Table 1).

There was no significant difference based on the age and sex of patients. The mean age of patients in sutured group was  $46.26 \pm 15.28$  years and  $48.04 \pm 13.79$  years of non-suture group.

**Table 1: Incidence rate of different diseases**

Diagnosis	Incidence				Total	
	Suture group		Non-suture group		No. of Patients	%age
	No. Patients	of %age	No. Patients	of %age		
Cholelithiasis	17	34	27	54	44	44
Umbilical hernia	12	24	2	4	14	14
Ovarian mass	6	12	2	4	8	8
Renal calculi	4	8	3	6	7	7
Intestinal obstruction	2	4	2	4	4	4
CA rectum	0	0	2	4	2	2
Gallbladder growth	0	0	1	2	1	1
Achalasia cardia	0	0	1	2	1	1
Pseudomyxoma peritonei	0	0	1	2	1	1
Hydatid cyst	1	2	0	0	1	1
Rectal prolapse	0	0	1	2	1	1
Others	8	16	8	16	16	16
Total	50	100	50	50	100	100

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16% patients of suture group and 18% patients of non-suture group had seroma collection on 3<sup>rd</sup> postoperative day, p value =0.790 showing no significant difference was found between the two groups. On 7<sup>th</sup> postoperative day, 8% cases of suture group and 18% cases of non-suture group developed seroma (Table 2).

**Table 2: Comparison of day's wise incidence of infectious and non-infectious complications in clean operation groups**

Complications	Day 3		Day 7		Day 14		Day 30	
	Suture	Non-suture	Suture	Non-suture	Suture	Non-suture	Suture	Non-suture
<b>Seroma</b>	8(16%) p = 0.790; NS	9(18%)	4(8%) p = 0.137; NS	9(18%)	0	0	0	0
<b>Hematoma</b>	0	0	0	0	0	0	0	0
<b>Infection</b>	0	0	2(4%) p = 1.00; NS	2(4%)	0	1(2%) p = 0.315; NS	0	0
<b>Dehiscence</b>	0	0	1(2%) p = 1.00; NS	1(2%)	1(2%) p = 0.558; NS	2(4%)	0	0
<b>Burst abdomen</b>	0	0	0	0	0	0	0	0
<b>Eversion</b>	0	0	0	0	0	0	0	0

**Table 3: Comparison of infectious and non-infectious complications in clean operation groups**

Diagnosis	Infectious				Non-infectious			
	Suture group		Non-suture group		Suture group		Non-suture group	
	No./Total	%age	No./Total	%age	No./Total	%age	No./Total	%age
Cholelithiasis	0/17	0	0/27	0	0/17	0	2/27	4
Umbilical hernia	0/12	0	0/2	0	3/12	6	0/2	0
Ovarian mass	0/6	0	0/2	0	4/6	8	0/2	0
Renal calculi	0/4	0	0/3	0	0/4	0	1/3	2
Intestinal obstruction	0/2	0	1/2	2	1/2	2	2/2	4
CA rectum	0	0	1/2	2	0	0	1/2	2
Gallbladder growth	0	0	0/1	0	0	0	1/1	2
Achalasia cardia	0	0	0/1	0	0	0	1/1	2
Pseudo. peritonei	0	0	0/1	0	0	0	1/1	2
Hydatid cyst	1/1	2	0	0	0/1	0	0	0
Rectal prolapse	0	0	1/1	2	0	0	1/1	2
Others	0/8	0	0/8	0	0/8	0	0/8	0
Total	1/50	2/100	3/50	6/100	8/50	16/100	10/50	20/100

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4% cases of suture group developed infection on 7<sup>th</sup> post-operative day. These were cases of Hydatid cyst and ovarian mass one each. Similarly 4% cases of group B developed infection these were cases of rectal prolapse and carcinoma rectum one each (p value = 1). Swab for Culture sensitivity was sent. Antibiotics were started according to culture and sensitivity report and infection was controlled within 1 week with regular dressing (Table 2).

No patient had dehiscence on day 3 post-operative, one patient from both group had dehiscence on day 7<sup>th</sup> and on 14<sup>th</sup> post-operative day one patient from suture group had dehiscence and 2 patients from non-suture group. No patient was having dehiscence on day 30<sup>th</sup> postoperatively (p value = 0.558). Dehiscence resolved by secondary healing and no surgical intervention was required (Table 2).

No patient had the complication of hematoma formation, burst abdomen and eversion of wound edges.

2% patients of suture group had infectious complications which were seen in patients of Hydatid cyst. 6% patients of non-suture group had infectious complications with intestinal obstruction, CA rectum, and rectal prolapse each contributing 2% (Table 3).

16% patients of suture group had non-infectious complications with 8% of ovarian mass, 6% patients of umbilical hernia, 2% of intestinal obstruction. In non-suture group 20% had non-infectious complications with 4% patients of cholelithiasis, 4% of intestinal obstruction, 2% from each of renal calculi, CA rectum, gall bladder growth, achalasia cardia, pseudomyxoma peritonei and rectal prolapse (Table 3).

The mean time taken for suture removal was  $9.60 \pm 1.05$  days for suture group and  $9.64 \pm 1.58$  days for non-suture group.

## Discussion

In our study, most common cause of elective abdominal surgery was cholelithiasis.

Similar distribution of cases were seen in study done by Khan *et al.*, (2004) in which most common cause of elective surgery was gall bladder diseases (59%).

In our study, in group A 24% were males and 76% were females and in group B 29% were males and 74% were females. In most of studies in literature shows males more than females.

In group A, age varied from 16 years to 70 years with the mean age of  $46.26 \pm 15.28$  years. In group B also age varied from 16 years to 70 years with the mean age of  $48.04 \pm 13.79$  years. The age wise difference between the two groups was statistically non-significant.

In our study, 8 (16%) patients of group A and 9 (18%) patients of group B developed seroma and on 7<sup>th</sup> postoperative day, 4 (8%) and 9 (18%) patients had seroma in group A and group B respectively and no patient had seroma on day 14<sup>th</sup> and 30<sup>th</sup> postoperatively. Magann *et al.*, (2002) in their study found that 1% in suture group and 2.4% in non-suture group had seroma collection. In a meta-analysis done by Chelmow *et al.*, (2004) suturing of subcutaneous fatty layer resulted in decrease in risk of wound disruption due to decreased seroma formation. Allaire *et al.*, (2009) showed that 7.7% and 11.5% had seroma collection in suture and non-suture group. However, the differences were not of statistical significance.

4% cases from each group developed infection. Kong *et al.*, (1993) had published that there were no significant differences in the incidence of wound infection. Paral *et al.*, (2007) in their studied showed that 4.6% and 4.8% patients of clean contaminated surgeries developed superficial incision infection in suture and non-suture group respectively.

No significant difference of development of wound dehiscence between these two groups was found. Similar results were seen in study done by Paral *et al.*, (2007) in which partial wound dehiscence was seen in 1.8% and 1.0% cases of suture and non-suture group till 3<sup>rd</sup> postoperative day and no case of total wound dehiscence was present.

Both groups showed non-significant statistical differences for mean time taken for suture removal.

In our study, 2% patients of group A had infectious complications and 6% patients of group B had infectious complications. 16% patients of group A had non-infectious complications and 20% patients of group B had non-infectious complications. Milewski and Thomson (1980), performed a prospective study with 142 patients who underwent surgery found an equal percentage of wound complications (seroma, hematoma, surgical site infection) in the suture and non-suture groups.

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Similar to other studies, our study also had no significant statistical differences in the occurrence of infectious or non-infectious complications between suture and non-suture group.

## Conclusion

The maximum numbers of patients undergoing surgery were of cholelithiasis 44% followed by umbilical hernia 14%, ovarian mass 8% and renal calculi 7%. Infectious complications were present in 2% patients of sutured group and 6% of non-sutured group and 16% patients from sutured group had non-infectious complications and 20% from non-sutured group had non-infectious complications.

The results achieved suggest that omission of subcutaneous fat tissue suturing in planned abdominal surgical procedures does not increase the occurrence of infectious or non-infectious wound complications. Omitting subcutaneous suturing can globally also lead to a significant saving of costs of suture material and shorten time of surgery.

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