

## Original Research

## Comparison Of Absorbable With Non- Absorbable Sutures In Closure Of Laparotomy Incisions

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### ABSTRACT

**Background:** To compare absorbable with non- absorbable sutures in closure of laparotomy incisions.

**Materials and Methods:** Sixty patients of both genders were divided into 2 groups of 30 each. In group I, fascia was closed with Prolene and in group II, fascia was closed with Vicryl. Using continuous suturing technique, fascia was closed with same size suture in both groups. Length of suture in both groups was constant 4:1. Post-operative infection at 3rd, 5th, 7th and 9th days was recorded.

**Results:** Group I had 15 males and 15 females and group II had 16 males and 14 females. Procedure was elective performed in 17 in group I and 18 in group II and emergency 13 in group I and 12 in group II. Diagnosis was hemoperitoneum 11 in group I and 12 in group II, blunt trauma abdomen 6 in group I and 3 in group II, gut gangrene 3 in group I and 2 in group II, mass abdomen 2 in group I and 3 in group II, intestinal perforation seen in 5 in group I and 6 in group II and intestinal obstruction 3 in group I and 4 in group II. The difference was significant ( $P < 0.05$ ). Wound dehiscence was seen in 7 in group I and 12 in group II. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Prolene as compared to absorbable Vicryl suture had less wound dehiscence and better outcome.

**Keywords:** Prolene, Vicryl suture, laparotomy incisions.

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### INTRODUCTION

The choice of suture material is becoming increasingly complex. The multiple factors to consider when choosing a suture for closure of a fascial incision include its handling characteristics, ability to incite an inflammatory reaction, cost, knot security, and susceptibility to in vivo degradation.<sup>1</sup> One of the more important factors to consider when picking a suture is the durability of tensile strength. Currently available sutures are described as rapidly absorbing, slowly absorbing, and nonabsorbable/permanent.<sup>2</sup>

Postoperative complete wound dehiscence is an unfortunate condition, and serious complication is associated with a high morbidity and mortality rate. Surgeons have been continuously striving to overcome postoperative complications associated with laparotomy wound closure using newer techniques and newer suture materials.<sup>3</sup>

Wound dehiscence is a multifactorial problem, conditioned by local and systemic, as well as pre-, per-, and postoperative factors. Wound dehiscence occurs because of the distracting forces in a wound which exceed the holding forces.<sup>4,5</sup> It is also important to acknowledge that the failures after abdominal wound closure (early dehiscence and late incisional hernia) are due to poor closure technique, deep wound infection, postoperative vomiting, persistent postoperative cough, postoperative abdominal distension, and poor general condition of the patient which includes obesity, jaundice, malignant disease, hypoproteinemia, and anemia.<sup>6</sup> Each suture should be tied loosely with a measured tension sufficient to hold the wound together while avoiding pressure necrosis.<sup>7,8</sup> We performed this study to compare absorbable with non-absorbable sutures in closure of laparotomy incisions.

## MATERIALS & METHODS

After considering the utility of the study and obtaining approval from ethical review committee, we selected sixty patients of both genders. A valid written consent was obtained before starting the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 30 each. In group I, fascia was closed with Prolene and in group II, fascia was closed with Vicryl. Using continuous suturing technique, fascia was closed with same size suture in both groups. Length of suture in both groups was constant 4:1. Post-operative infection at 3rd, 5th, 7th and 9th days was recorded. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

## RESULTS

**Table I Distribution of patients**

Groups	Group I	Group II
Type of suture	Prolene suture	Vicryl suture
M:F	15:15	16:14

Group I had 15 males and 15 females and group II had 16 males and 14 females (Table I).

**Table II Comparison of parameters**

Variables	Parameters	Group I	Group II	P value
Procedure	Elective	17	18	0.81
	Emergency	13	12	
Diagnosis	Hemoperitoneum	11	12	0.94
	Blunt trauma abdomen	6	3	
	Gut gangrene	3	2	
	Mass abdomen	2	3	
	Intestinal perforation	5	6	
	Intestinal obstruction	3	4	

Procedure was elective performed in 17 in group I and 18 in group II and emergency 13 in group I and 12 in group II. Diagnosis was hemoperitoneum 11 in group I and 12 in group II, blunt trauma abdomen 6 in group I and 3 in group II, gut gangrene 3 in group I and 2 in group II, mass abdomen 2 in group I and 3 in group II, intestinal perforation seen in 5 in group I and 6 in group II and intestinal obstruction 3 in group I and 4 in group II. The difference was significant ( $P < 0.05$ ) (Table II).

**Table III Assessment of wound dehiscence**

Wound dehiscence	Group I	Group II	P value
Yes	7	12	0.05
No	23	18	0.04

Wound dehiscence was seen in 7 in group I and 12 in group II. The difference was significant ( $P < 0.05$ ) (Table III).

## DISCUSSION

A suture used for fascial closure should maintain reasonable tensile strength for 4-6 weeks, because in animal studies this is the time required for a fascial incision to regain approximately 50% of its baseline strength.<sup>9,10</sup> It would be reasonable to assume that the interval to 50% baseline strength would be longer in a patient with suspected slow healing which would argue for use of a more durable or permanent suture in these patients, but hard evidence for this choice is lacking.<sup>11,12</sup> We performed this study to compare absorbable with non-absorbable sutures in closure of laparotomy incisions.

Our results showed that group I had 15 males and 15 females and group II had 16 males and 14 females. Pai et al<sup>13</sup> in their study 100 patients were included. The two study groups (Prolene and Polydioxanone) were homogenous, with no significant difference between age, BMI, comorbidities and indication for surgery. Surgical site infection was significantly more in prolene group ( $p=0.031$ ). Duration of surgeries was longer in prolene group ( $p=0.020$ ), hence, a subgroup analysis was done and only surgeries under 4-hour duration were analysed. It showed no difference between the two groups with respect to surgical site infection ( $p=0.320$ ). There was no significant difference between the two groups in burst abdomen and incisional hernia. We observed that procedure was elective performed in 17 in group I and 18 in group II and emergency 13 in group I and 12 in group II. Diagnosis was hemoperitoneum 11 in group I and 12 in group II, blunt trauma abdomen 6 in group I and 3 in group II, gut gangrene 3 in group I and 2 in group II, mass abdomen 2 in group I and 3 in group II, intestinal perforation seen in 5 in group I and 6 in group II and intestinal obstruction 3 in group I and 4 in group II. Singh et al<sup>14</sup> assessed wound infection rates in 320 patients in the four groups. Older age, male sex, diabetes, anemia malnutrition and sepsis were found to be highly significant risk factor for wound infection. Suture material (Prolene vs Vicryl) and technique (continuous vs interrupted) arms did not show statistically significant differences outcomes in regard to wound infection rates, however there appears to be less incidences of wound dehiscence formation with delayed absorbable sutures (Vicryl).

Our results showed that wound dehiscence was seen in 7 in group I and 12 in group II. Pandey et al<sup>15</sup> compared the incidence of wound dehiscence with a delayed absorbable and a nonabsorbable suture material in the mass closure of vertical laparotomy wounds. In one group, 100 patients were analyzed after closure with Prolene® and in another group, 100 patients were analyzed after closure with Vicryl®. The incision was closed by continuous far and near suture technique using polypropylene (Prolene) suture in one group and a synthetic delayed absorbable polyglactin 910 (Vicryl) suture in the other group. There was significant difference in the incidence of wound dehiscence between the two groups: 6 % with Prolene and 17 % with Vicryl. The overall incidence of wound dehiscence was 11.5 %.

## CONCLUSION

Prolene as compared to absorbable Vicryl suture had less wound dehiscence and better outcome.

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