



COMPARISON OF VARIOUS OUTCOMES IN CONTINUOUS VERSUS INTERRUPTED FASCIAL CLOSURE AFTER MIDLINE LAPAROTOMY

General Surgery

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ABSTRACT

Introduction: One of the most common operative procedures performed at a hospital setting is a laparotomy. The ideal method is which is quick, provides adequate tensile strength, and remains secure even in the presence of local or systemic infection. This study was planned to compare various outcomes following two techniques of fascial closure namely continuous and interrupted using a delayed absorbable suture material (polydioxanone) in patients undergoing midline emergency laparotomies in our institute. **Aims & Objectives:** To compare various outcomes in continuous versus interrupted fascial closure after midline laparotomy in regards to time taken for closure, wound dehiscence, seroma formation and suture sinus formation. **Methods:** A total of 60 patients were taken which were divided into two groups : Group I – Interrupted and Group II – Continuous method of midline closure. **Result:** In this study Mean time taken for closure was more in Group I (32.05 vs 23.7) , While Seroma formation, Wound dehiscence and suture sinus formation were more in Group II (53.3% vs 40%; 26.7% vs 13.3%; 33.3% vs 20%). **Conclusion:** This study shows us that the Interrupted suturing technique overweighs the continuous suturing technique.

KEYWORDS

INTRODUCTION:

One of the most common operative procedures performed at a hospital setting is a laparotomy. The most popular method for opening the abdomen in emergency and elective situations is a midline laparotomy because it is straightforward, offers sufficient exposure to all four quadrants, and allows for fast exposure with little blood loss. We may make the incision longer if necessary.¹

The linea alba, a weak, tendinous zone, has to be opened in order to do a midline laparotomy.² Traditional methods for laparotomy wound closure include continuous closure vs interrupted closure, single layer versus mass closure, and absorbable versus non-absorbable sutures.¹

The ideal method of wound closure would be one that can be completed quickly, approximates the tissue in such a way that the normal healing process can take place under ideal conditions, provides adequate tensile strength to the incision until the wound heals, and remains secure even in the presence of local or systemic infection. The benefit of the continuous suture is that it is quicker and equally distributes tension throughout the suture line. The fact that there is just one stitch keeping the whole fascia together is a drawback. Although the approach of many interrupted sutures has been used effectively for many years, it has the drawbacks of taking a long time to complete and isolating the stress to each individual stitch.

Following fascial closure, problems that might occur include suture sinus development, incisional hernia, wound dehiscence, and wound infection. The most significant reasons include improper surgical technique, persistently elevated intra-abdominal pressure, and locally infected necrosis.^{3,4}

In emergency laparotomies for perforation peritonitis, abdominal wound dehiscence is a frequent side effect.⁵ Premature bursting, opening, or splitting along physiological or surgical suture lines is referred to as wound dehiscence. It often occurs as a result of slow wound healing. Diabetes, old age, obesity, and trauma after surgery are risk factors.¹ Patients who arrive in emergency rooms in underdeveloped nations like India often have low nutritional condition, which is also one of the main causes of wound dehiscence. Between the sixth and eighth day after surgery, the abdominal incision breaks open, allowing the viscera to protrude. Wound infection is commonly blamed for this. Although stitch sinuses may appear little, they really put patients through a great deal of pain and morbidity. They are blind-ended tracts that develop around a retained suture due to antigenicity or an infectious condition. They go from the stitch to the skin's surface, where serous or purulent material may discharge.⁶

This study was planned to compare various outcomes following two techniques of fascial closure namely continuous and interrupted using a delayed absorbable suture material (polydioxanone) in patients undergoing midline emergency laparotomies in our institute.

MATERIALS AND METHODS:

The present prospective study was conducted in Department of General Surgery, Mahatma Gandhi Medical College, Jaipur, Rajasthan. 60 patients undergoing exploratory laparotomy with midline incision during the March 2021 to March 2022 were included.

These patients were divided into two groups. Group I (study group) 30 patients were undergo closure of abdominal wall using interrupted polydioxanone No 1 suture.

Group II (control group) 30 patients were undergo closure of abdominal wall using continuous polydioxanone No 1 suture.

Inclusion criteria:

1. All patients undergoing midline laparotomy.
2. Age more than 18 years.
3. Patients willing to give consent.

Exclusion criteria:

1. Age less than 18 years and more than 70 years
2. Pre-existing severe co-morbid conditions: severe renal and liver disease.
3. Anaemia (Hb <10 mg/dl), uncontrolled diabetes, malignancy.
4. Patients on anticancer chemotherapy or steroids.
5. Previous laparotomies through midline incision.

RESULT:

60 patients were included in the study and following observations were made.

For both the groups, the most commonly affected age groups were 31-40 and 41-50 years with the male gender predominance seen in both groups.

Comparison of Mean time taken for closure in both the groups

Group	N	Mean	Std. deviation	Std. error mean	t value	P value
Interrupted	30	32.053	11.46	2.09	3.075	0.003 (S)
Continuous	30	23.701	9.4769	1.7302		

In comparing the average time taken is less in group II as compared to group I.

This shows that the result is significant as the P value is $p < 0.05$.

Comparison of Postoperative Seroma of both the groups

	Group I (Interrupted)		Group II (Continuous)		P Value
	No.	%	No.	%	
Yes	12	40.0	16	53.3	0.043 (S)
No	18	60.0	14	46.7	
Total	30	100.0	30	100.0	

This shows that there is less incidence of seroma in patients of Group I who had interrupted closure of abdominal fascia in midline laparotomy wounds.

This shows that the result is significant as the P value is $p < 0.05$.

Comparison of Wound dehiscence of both the groups:

	Group I (Interrupted)		Group II (Continuous)		P Value
	No.	%	No.	%	
Yes	4	13.3	8	26.7	0.003 (S)
No	26	86.7	22	73.3	
Total	30	100.0	30	100.0	

This shows that the wound dehiscence complication is more in patients with continuous closure.

This shows that the result is significant as the P value is $p < 0.05$.

Comparison of Suture Sinus of both the groups during the follow up:

	Group I (Interrupted)		Group II (Continuous)		P Value
	No.	%	No.	%	
Yes	6	20	10	33.3	0.000 (S)
No	24	80	20	66.7	
Total	30	100.0	30	100.0	

This shows that the percentage of suture sinus is less in interrupted closure when compared to the continuous closure during the follow up studies.

This shows that the result is highly significant as the P value is $p < 0.001$.

DISCUSSION:

The best method of abdominal closure is one that maintains tensile strength throughout the healing process with good tissue approximation, does not promote wound infection or inflammation, is well tolerated by patients and is technically simple and expedient.

Because of difficulties arising from differently tailored study designs, the surgical literature has not clearly demonstrated an optimal technique to close abdominal fascia, especially in emergency settings.

In this study, Mean time taken for closure in Group I was 32.05 minutes and in Group II was 23.70 minutes. In comparing the average time taken is less in group II as compared to group I. This shows that the result is significant as the P value is $p < 0.05$. It was similar to studies of Shashikala et al⁶, McNeill et al⁷, Sharma AC et al⁸.

Seroma is the most common disturbing complication among the patients who undergo midline laparotomy for perforative peritonitis in the emergency setting. This is due to the inflammation caused by the ongoing peritonitis leading to fat necrosis due to the residing micro septic foci. In our study, 53.3% of the 30 patients who underwent continuous closure presented with wound seroma compared to 40% of wound seroma in interrupted suture closure. This signifies that there is less incidence of seroma in patients of Group I who had interrupted closure of abdominal fascia in midline laparotomy wounds. This shows that the result is significant as the P value is $p < 0.05$.

Wound dehiscence/burst abdomen was noted and recorded in all patients from both the groups. The incidence of wound dehiscence is higher in Group II patients who had continuous closure of laparotomy wound. 86.7% of the patients from Group I with interrupted closure for laparotomy wounds are free of wound dehiscence. This shows the interrupted closure is better than continuous closure as the wound dehiscence complication is more in patients with continuous closure.

This shows that the result is significant as the P value is $p < 0.05$. This was similar to studies of Bansiwat et al⁹, Karwasara et al¹⁰.

Post-operatively follow up was done for the patients, in which 33.3% patients who undergone continuous closure had suture sinus as complication. This percentage of suture sinus is less in interrupted closure when compared to the continuous closure. This shows that the result is highly significant as the P value is $p < 0.001$. This was similar to study of Iwase et al¹¹.

CONCLUSION:

Our study was conducted in 60 patients who underwent exploratory laparotomy. These were divided into 2 groups randomly : Group A (30 patients) and Group B (30 patients).

In Group A – Interrupted suturing was done for fascia closure and in Group B – Continuous suturing was done for fascia closure. All these patients (Both groups) were followed up in early post-operative period and regular follow up was done at 1, 3 and 6 months.

In Group A (Interrupted closure), 12 patients developed Seroma and 4 patients had Wound dehiscence; While in Group B (Continuous closure), 16 patients developed Seroma and 8 patients had Burst abdomen. Therefore, Interrupted suturing technique overweighs the continuous suturing technique.

Hence the Interrupted suturing technique should be favoured more in comparison to the continuous suturing technique.

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