



A PROSPECTIVE STUDY TO EVALUATE VARIOUS FACTORS THAT CAN RESULT IN POST-OPERATIVE ABDOMINAL WOUND DEHISCENCE

General Surgery

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ABSTRACT

Wound dehiscence is partial or complete separation of previously approximated wound margins as a result of inadequate wound healing. It usually occurs when wound fails to achieve required strength to withstand the underlying tissues and organs which may protrude out of the separated wound. Multifactorial causes are incriminated in dehiscence including general patient profile like age, sex, malnutrition and pre-operative medical conditions like anaemia, diabetes, hypoproteinaemia, jaundice, renal failure, prolonged steroid therapy, malignancy, duration of surgery, cough, wound infection leading to increased morbidity, prolonged hospitalization, and additional surgical interventions. By identifying key risk factors and understanding their interplay, this study aims to enhance preventive measures, optimize surgical practices, and ultimately reduce the incidence of wound dehiscence, improving overall patient recovery and minimizing healthcare burdens.

KEYWORDS

wound dehiscence, mortality, sepsis

INTRODUCTION:

Wound dehiscence most commonly occurs on post op day 5th-8th with incidence of 0.4 to 3.5%¹ with higher incidence in emergency surgeries and patients having co-morbidities. No single cause is responsible for wound dehiscence and as a rule it is related to combination of factors.² It may manifest as either partial or complete disruption. Partial dehiscence is characterized by the separation of one or more layers of the abdominal wall, with preservation of the fascial sheath and peritoneum. Complete dehiscence involves the failure of all abdominal wall layers, often resulting in visceral evisceration. Wound dehiscence is frequently associated with prolonged hospitalization due to the need for intensive monitoring, infection control, and advanced wound management strategies which not only places a substantial burden on healthcare infrastructure but also contributes to increased physical, emotional, and financial stress for the patient. The management of dehiscent wounds often necessitates additional surgical interventions, each of which carries additional anaesthesia-related complications, elevated infection rates, and extended recovery periods. The convergence of these adverse outcomes including sepsis, extended hospital stays, and repeat surgical procedures contributes to the elevated morbidity and mortality rates. Therefore, early recognition and prompt intervention are paramount. no significant study has been published for the region of eastern UP in last 8 years to evaluate such a dreaded complication of any abdominal surgery. The mortality rate ranges from 9 to 50%³. The rate is notably higher in complex surgeries like open abdominal procedures and in patients undergoing emergency surgeries due to increased contamination and compromised surgical conditions⁴. In about 20–45% of cases, it becomes a significant risk factor associated with death during the perioperative period. The high mortality, prolonged hospitalization, and increased incidence of reoperation, with their associated costs, emphasize the severity of the problem⁵.

Methodology

The aim of the study is to identify risk factors that can result in post-operative abdominal wound dehiscence and to estimate the influence of wound dehiscence on in hospital mortality.

The Study Design is a prospective observational Cohort study conducted at the Department of General Surgery at BRD medical college, Nehru Hospital, Gorakhpur between DEC 2023-MARCH 2025 for a period of 16 months for a sample size of 85 patients. All patients above 10 years of age giving consent and undergoing surgery in emergency and elective OT for abdominal causes were **included** in the study. While Pregnant and lactating women, patients undergoing elective appendicectomy, elective inguinal hernia surgeries, port sites of laparoscopic procedures were **excluded** in the study. Their inclusion would dilute the incidence and make comparisons less accurate. Patients not giving consent for participation and Patient lost to follow up were also excluded from the study.

Table 1: Distribution Of Wound Dehiscence

WOUND DEHISCENCE	Frequency	Percent
NO	71	83.5%
YES	14	16.5%
Total	85	100.0%

Overall, 16.5% (14 patients) experienced wound dehiscence, while 83.5% (71 patients) did not develop any wound complications.

Table 2: Frequency Of Wound Dehiscence With Types Of Surgery

WOUND DEHISCENCE TYPE				
TYPE OF SURGERY	COMPLETE	NON E	PARTIAL	TOTAL
CLEAN	0	7	1	8
CLEAN CONTAMINATED	4	36	1	41
CONTAMINATED	2	21	1	24
DIRTY	5	6	1	12
TOTAL	11	70	4	85

12.9% of cases experienced complete wound dehiscence, 82.4% had no dehiscence, and 4.7% had partial dehiscence. Among the clean surgeries, 87.5% showed no dehiscence, with 12.5% showing partial dehiscence. For clean-contaminated surgeries, 9.8% had complete dehiscence, and 51.4% had no dehiscence, with 2.4% showing partial dehiscence. In the contaminated category, 8.3% experienced complete dehiscence, 87.5% had no dehiscence, and 4.2% had partial dehiscence. The dirty surgeries had the highest rate of complete dehiscence at 41.7%, followed by 50% with no dehiscence and 8.3% with partial dehiscence.

Table 3: Frequency Of Wound Dehiscence In Different Fascial Closure Technique

WOUND DEHISCENCE TYPE				
FASCIAL CLOSURE TECHNIQUE	COMPLETE	NON E	PARTIAL	TOTAL
CONTINUOUS	9	55	4	68
INTERRUPTED	1	5	0	6
INTERRUPTED +CONTINUOUS	1	10	0	11
TOTAL	11	70	4	85

In the continuous closure group, 13.2% had complete dehiscence, 80.9% showed no dehiscence, and 5.9% had partial dehiscence. For the interrupted closure technique, 16.7% had complete dehiscence, 83.3% had no dehiscence, and no partial dehiscence was observed. In the interrupted + continuous closure group, 9.1% had complete dehiscence, 90.9% had no dehiscence, and no partial dehiscence was reported. The p-value of 0.8595 indicates that there is no statistically significant difference in wound dehiscence occurrence across the different fascial closure techniques.

Table 4: Frequency Of Wound Dehiscence With Skin Closure Technique

WOUND DEHISCENCE TYPE				
SKIN CLOSURE	COMPLETE	NONE	PARTIAL	TOTAL
STAPLERS	5	22	0	27
SUTURES	6	48	4	58
TOTAL	11	70	4	85

Among those using staplers, 18.5% experienced complete dehiscence, 81.5% had no dehiscence, and no partial dehiscence was observed. For sutures, 10.3% had complete dehiscence, 82.8% had no dehiscence, and 6.9% had partial dehiscence. The p-value of 0.2445 indicates that there is no statistically significant difference in the occurrence of wound dehiscence between the use of staplers and sutures for skin closure.

Table 5: Frequency Of Wound Dehiscence With Type Of Ot

WOUND DEHISCENCE TYPE				
TYPE OF OT	COMPLETE	NONE	PARTIAL	TOTAL
ELECTIVE	4	26	2	32
EMERGENCY	7	44	2	53
TOTAL	11	70	4	85

Among elective surgeries, 12.5% had complete dehiscence, 81.3% had no dehiscence, and 6.3% had partial dehiscence. For emergency surgeries, 13.2% experienced complete dehiscence, 83.0% had no dehiscence, and 3.8% had partial dehiscence. The p-value of 0.8714 suggests that there is no statistically significant difference in wound dehiscence between elective and emergency surgeries.

Table 6: Association Between Wound Dehiscence: Age Groups

WOUND DEHISCENCE	<20	21-40	41-60	>71	TOTAL
NO	5	30	22	14	71
YES	4	1	6	3	14
TOTAL	9	31	28	17	85

7.0% of patients under 20 years had dehiscence, while 42.3% of those aged 21-40 years and 31.0% of those aged 41-60 years had wound dehiscence. Among those older than 71 years, 19.7% experienced dehiscence. The p-value of 0.0224 suggests a statistically significant difference in wound dehiscence across age groups, with the 21-40 years age group having the highest incidence of dehiscence.

Table 7: Distribution Of Mean Hb: Wound Dehiscence Type

		Num ber	Mean	SD	Mini mum	Maxim um	Median	P- value
HB	COMP LETE	11	9.7364	1.4023	7.1000	11.9000	9.7000	0.0119
	NONE	70	11.4200	1.6773	8.3000	15.1000	11.1500	
	PARTI AL	4	11.5500	2.9783	7.6000	14.5000	12.0500	

The mean haemoglobin (HB) level for complete procedures was 9.74 ± 1.40 g/dL, while for partial procedures it was 11.55 ± 2.98 g/dL, and for none it was 11.42 ± 1.68 g/dL. The p-value of 0.0119 indicates a statistically significant difference in haemoglobin levels between the different completion categories.

Table 8: Distribution Of Mean S. Albumin: Wound Dehiscence Type

		Num ber	Mean	SD	Minim um	Maxi mum	Media n	P- value
S. ALBU MIN	COMP LETE	11	3.0818	.3945	2.5000	3.7000	2.9000	0.5307
	NONE	70	3.3214	.7405	1.3000	6.5000	3.2000	
	PARTI AL	4	3.1250	.8617	2.0000	3.8000	3.3500	

The mean serum albumin (S. Albumin) level for complete procedures was 3.08 ± 0.39 g/dL, while for partial procedures it was 3.13 ± 0.86 g/dL, and for none it was 3.32 ± 0.74 g/dL. The p-value of 0.5307 indicates no statistically significant difference in serum albumin levels between the different completion categories.

Summary

- Age And Wound Dehiscence:** The 21-40 years age group had the highest rate of wound dehiscence at 42.3%, with a statistically significant difference across age groups ($p=0.0224$).
- Diagnosis Distribution:** The 21-40 years group had the highest proportion of cases (36.5%), with Perforation Peritonitis (40%) in emergency surgeries and F/U/C Ileostomy (45.5%) for stoma reversal in elective OT being most common. No significant

difference in diagnosis prevalence across age groups ($p=0.7861$).

- Surgical Procedures And Dehiscence:** EL + loop ileostomy had the highest dehiscence rates (17.6% complete, 25% partial). No significant difference in dehiscence across procedures ($p=0.9392$).
- Surgery Type And Dehiscence:** Clean surgeries had 87.5% no dehiscence, while dirty surgeries showed the highest complete dehiscence rate (41.7%) ($p=0.0429$).
- Fascial Closure Techniques:** No significant difference in wound dehiscence between continuous and interrupted fascial closure ($p=0.8595$).
- Skin Closure Techniques:** No significant difference in dehiscence between staplers and sutures for skin closure ($p=0.2445$).
- Smoking And Alcohol:** statistically significant impact of smoking but not alcohol on wound dehiscence ($p=0.0486$, $p=0.9583$).
- Comorbidities:** patients with history of Diabetes Mellitus (DM) had higher rates of complete and partial wound dehiscence ($p=0.0055$).
- Past Surgical History:** No significant association between prior surgeries and wound dehiscence ($p=0.2497$).

CONCLUSION

We concluded that, post-operative abdominal wound dehiscence, the partial or complete separation of a surgical wound, can result from various factors. Key contributors include poor nutritional status, which impairs wound healing; infection, which leads to tissue breakdown and delayed healing; and mechanical stress from factors like coughing, vomiting, or physical strain. Comorbidities, such as diabetes mellitus and obesity, increase the risk by compromising immune function and altering tissue repair mechanisms. Inadequate surgical technique, including tension on wound edges or improper suturing, also plays a role. Additionally, smoking impairs blood flow, hindering oxygen delivery to the healing tissue. The use of corticosteroids or immunosuppressive medications can suppress the inflammatory response, affecting wound closure.

Limitations Of The Study

- It may lack the generalizability of the results to whole population due to change in demographic profile,
- selection bias as the sample size may not adequately represent the entire population of patients undergoing abdominal surgeries.
- The study duration of 16 months may limit the ability of the investigator to observe long-term outcomes and complications,
- Relying on patients to self-report certain data may lead to recall bias or inaccurate information, particularly concerning their preoperative condition and personal health habits.
- Confounding factors, such as differences in surgical technique, surgeon experience, and intraoperative decision-making, could potentially impact the results.
- The study was carried out in a tertiary care hospital, so hospital bias cannot be ruled out.

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