



A CLINICAL STUDY ON FACTORS INFLUENCING ABDOMINAL WOUND DEHISCENCE IN POST LAPAROTOMY PATIENTS

Dr Mahalakshmi Ashok Kumar

M.S., DGO, Associate Professor, KAPV Government Medical College, tiruchirappalli

Dr Sivasarma

M.S., Junior Resident, KAPV Government Medical College, tiruchirappalli

ABSTRACT

Introduction: Abdominal wound dehiscence is defined as the postoperative separation of layers of a laparotomy wound, with or without even traction. Despite major advances in the preoperative care of surgical patients, including the introduction of broader spectrum antibiotics and an improved understanding of the effects of systemic illness on wound healing, the incidence of abdominal wound dehiscence has remained constant at 0.4 to 3.0%. **Aims And Objectives:** To identify significant risk factors in patients developing abdominal wound dehiscence. To identify the diseases/causes involved in the development of wound dehiscence. To study the type of incision leading to wound dehiscence. To study the incidence of wound dehiscence in elective and emergency surgery. **Materials And Methods:** Patients admitted to KAPV Government Medical College & MGMGH between October 2020 to September 2021 diagnosed with dehiscence of abdominal wound after undergoing surgical intervention in MGMGH were included in the study. It is a prospective study including 100 patients. **Conclusion:** Prompt and early diagnosis of abdominal wound dehiscence and proper treatment decrease morbidity and mortality. If the predisposing factors are well understood before doing any abdominal surgery, the present incidence and mortality rates can be reduced further.

KEYWORDS : Abdominal wound dehiscence, laparotomy, infection, hypoproteinemia, emergency surgery, tension suturing

INTRODUCTION

Abdominal wound dehiscence, also known as burst abdomen, acute wound failure, wound disruption, evisceration or eventration, remains one of the most dramatic and serious developments confronting the general surgeon. Few postoperative events cause such morbidity, and when accompanied by necrotizing fasciitis, none is as potentially disfiguring.

Abdominal wound dehiscence is defined as the postoperative separation of layers of a laparotomy wound, with or without even traction. Despite major advances in the preoperative care of surgical patients, including the introduction of broader spectrum antibiotics and an improved understanding of the effects of systemic illness on wound healing, the incidence of abdominal wound dehiscence has remained constant at 0.4 to 3.0%.^{1,2}

Two general factors play contributory roles in causing wound dehiscence - metabolic and local anatomic abnormalities and technical factors. Many aspects of the latter are within the surgeon's control, such as the site of the abdominal incision, technique of closure and type of suture employed, the use of retention sutures, and the placement of drains and enterostomies in relation to the wound. Metabolic abnormalities are commonly corrected before elective operations, a factor which increases the risks in emergency operations. At the same time, the alterable variables of patient age, the procedure itself - whether it be elective, emergent, clean, or contaminated, and associated systemic illness have been shown to be contributory.³⁻⁷

Although specific guidelines describe the re-operative management of abdominal wound dehiscence, more important is recognition at initial operation of the patient who is at risk for wound separation as well as implementing at that time measures to prevent its occurrence.

AIMS AND OBJECTIVES

- To identify significant risk factors in patients developing abdominal wound dehiscence.
- To identify the diseases/causes involved in the development of wound dehiscence.
- To study the type of incision leading to wound dehiscence.
- To study the incidence of wound dehiscence in elective and emergency surgery.

MATERIALS AND METHODS

Source of Data

Patients admitted to KAPV Government Medical College & MGMGH between October 2020 to September 2021 diagnosed with dehiscence of abdominal wound after undergoing surgical intervention in MGMGH were included in the study.

Type of study: Prospective study

Sample size: 100 patients

Inclusion criteria:

Patients aged above 18 years undergoing elective and emergency laparotomy.

Exclusion criteria:

1. Patients with previous laparotomies will be excluded.
2. Patients on steroids/immunosuppressant or anticancer therapy
3. Patients on anticoagulant therapy.

Data collection

Data regarding following aspects were collected:

- Age
- Gender
- Underlying pathology,
- Emergency /Elective Laparotomy,
- Type of Incision
- Type of Surgical Wound
- Procedure
- Nutritional status(BMI),
- Anemia
- Diabetes Mellitus,
- Hyperbilirubinemia,
- Hypoproteinemia,
- Drain placed or not,
- Wound infection,
- Post operative vomiting
- Post operative cough,
- Malignancy.

Statistical analysis

Standard clinical and statistical methods were employed to analyze the data.

RESULTS

Age Wise Distribution Of Abdominal Wound Dehiscence (Table -1)

Age	Frequency	Percent
<20	4	4.0%
21-30	13	13.0%
31-40	22	22.0%
41-50	29	29.0%
51-60	7	7.0%
>61	25	25.0%
Total	100	100.0%

Maximum cases (29.0%) were found to be in the 41-50 years age group. The youngest patient in this study was 18 years old and the oldest was 78 years.

Gender Wise Distribution Of Abdominal Wound Dehiscence Table 2: Sex Distribution

Sex	No. of cases	Percentage
Male	79	79

Female	21	21
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There was a marked male predominance in the sex distribution (79%)

Distribution Of Patients With Abdominal Wound Dehiscence In Relation To Intra Abdominal Pathology

Table 3: Primary Disease

Pathology	Frequency	Percent
Appendicular pathology	19	19.0%
Hollow viscus perf	54	54.0%
Intestinal obstruction	7	7.0%
Malignancy	7	7.0%
Others	13	13.0%
Total	100	100.0%

Out of 100 cases studied 54 patients were diagnosed to have peritonitis secondary to hollow viscus perforation. 7 patients were having malignancy, 19 patients had appendicular pathology, 7 patients with intestinal obstruction.

Effect Of Emergency Operations In Developing Abdominal Wound Dehiscence (Table - 4)

ELECTIVE/EMERGENCY	Frequency	Percent
ELECTIVE	22	22.0%
EMERGENCY	78	78.0%
Total	100	100.0%

Out of 100 cases 78 cases (78%) were operated as emergency surgery and 22 cases (22%) as elective surgery.

Frequency Of Abdominal Wound Dehiscence In Relation To The Type Of Incision (Table 5- Incision)

Incision	Frequency	Percent
Kochers	2	2.0%
Mc Burney's	13	13.0%
Midline	81	81.0%
Transverse	4	4.0%
Total	100	100.0%

Midline incision was found be the most common incision used in the preceding surgery in the study population (81%), the next common one being Mc Burney's (13%).

Abdominal Wound Dehiscence In Various Abdominal Procedures (Table -6)

Procedures	Frequency	Percent
Appendicectomy	19	19.0%
Grahams omental patch closure	33	33.0%
Ileostomy	11	11.0%
Others	24	24.0%
Resection and anastomosis	13	13.0%
Total	100	100.0%

Out of 100 cases studied, 33 cases were perforation closure, 13 cases were resection and anastomosis, 19 cases were appendicectomy.

Type Of Surgical Wound In Developing Abdominal Wound Dehiscence (Table - 7)

Wound	Frequency	Percent
Clean	28	28.0%
Clean contaminated	30	30.0%
Contaminated	36	36.0%
Dirty	6	6.0%
Total	100	100.0%

36 cases (36%) in the study have been classified as contaminated wound.

Frequency Of Abdominal Wound Dehiscence In Relation To Body Mass Index (Table - 8)

BMI	Frequency	Percent
<18.5	18	18.0%
>29.9	30	30.0%

Out of 100 cases studies 30 patients were with BMI above 29.9 and 18 patients were BMI below 18.5.

Prevalence Of Abdominal Wound Dehiscence In Anaemic Patients (Table -9)

HG	Frequency	Percent
<10	63	63.0%
>10	37	37.0%
Total	100	100.0%

Out of 100 cases studied 63 patients were with Hb% < 10 gm% and 37 patients were with 10 gm% and more than 10 gm%.

Prevalence Of Abdominal Wound Dehiscence In Diabetes Mellitus Patient (Table -10)

DM	Frequency	Percent
No	84	84.0%
Yes	16	16.0%
Total	100	100.0%

Out of 100 cases studied 16 patients were having diabetes mellitus.

Prevalence Of Abdominal Wound Dehiscence In Patients With Hyperbilirubinemia (Table -11)

Hyperbilirubinemia	Frequency	Percent
No	82	82.0%
Yes	18	18.0%
Total	100	100.0%

Out of 100 cases studied 18 patients were having Hyperbilirubinemia.

Prevalence Of Abdominal Wound Dehiscence In Patients With Hypoproteinemia (Table -12)

Hypoproteinemia	Frequency	Percent
No	37	37.0%
Yes	63	63.0%
Total	100	100.0%

Out of 100 cases studied 63 patients were with Hypoproteinemia.

Prevalence Of Abdominal Wound Dehiscence In Patients With Drain (Table -13)

Drain	Frequency	Percent
No	27	27.0%
Yes	73	73.0%
Total	100	100.0%

Out of 100 cases studied, in 73 patients drain was placed.

Prevalence Of Abdominal Wound Dehiscence In Patients With Wound Infection (Table -14)

Wound infection	Frequency	Percent
No	24	24.0%
Yes	76	76.0%
Total	100	100.0%

Out of 100 cases studied 76 patients wound infection was noted.

Prevalence Of Abdominal Wound Dehiscence In Relation To Post Operative Vomiting (Table -15)

Vomiting	Frequency	Percent
No	82	82.0%
Yes	18	18.0%
Total	100	100.0%

Out of 100 cases studied 18 patients complained of vomiting post operatively.

Prevalence Of Abdominal Wound Dehiscence In Relation To Cough (Table -16)

Postoperative cough	Frequency	Percent
No	32	32.0%
Yes	68	68.0%
Total	100	100.0%

Out of 100 cases studied 68 patients had postoperative cough.

Prevalence Of Abdominal Wound Dehiscence In Cancer Patients (Table-17)

Cancer patients	Frequency	Percent
No	93	93.0%
Yes	7	7.0%
Total	100	100.0%

Out of 100 cases studied 7 patients were with malignancy.

DISCUSSION

Abdominal wound dehiscence is one of the most dramatic and serious post operative complications after any major abdominal surgery. Acute wound failure can present as mechanical wound separation or dehiscence. Dermal wound separation worsens cosmetic results but is unlikely to cause significant harm, while abdominal wall wound failure can have life-threatening outcomes. Irrespective of the presentation of dehiscence, once the diagnosis is confirmed, the initial management includes replacement of intestinal contents into the peritoneal cavity and covering with moist saline packs, gastric decompression with nasogastric tube, intravenous fluids and broad spectrum antibiotics. Though it is considered a surgical emergency, the patient should be stabilized and any antecedent cause that led to dehiscence, if reversible, be corrected before embarking on surgical treatment. Surgery for burst abdomen involves reopening and inspecting the entire surgical wound, exploratory laparotomy to look for any intraabdominal abscesses or anastomotic leaks, thorough peritoneal lavage, and a good reclosure (continuous reclosure using heavy nonabsorbable suture material such as 0 poly propylene, with large tissue bites of 1.5 cm, a small stitch interval, and appropriate wound tension works best) along with application of retention sutures. In this study involving 100 patients who developed abdominal wound dehiscence postoperatively, most (78%) of patients had under gone a prior emergency laparotomy. This observation is in comparison with that done by Penninckx et al¹² who reported a 76% prevalence of emergency laparotomy in a study group with dehiscence.

In the present study, the mean age where the maximum cases were clustered was 41 - 50 years (29%).

Male predominance was noted in this study, with 71% of the study population being males and 29% being females. Thus male: female ratio was 7:1. Hampton¹⁰ observed that males are three times more often affected than females (1963).

A detailed analysis of various factors which impede wound healing was done, taking into consideration the factors that existed preoperatively and those that resulted from the primary condition that warranted surgery, or the surgery itself. Important among the preoperative factors is anemia which leads to reduced capillary perfusion, which in turn results in a low tissue oxygen tension, causing collagen defects and impaired wound healing. 63 out of 100 patients in the present study (63%) were found to be anemic. At least 70% of the normal hemoglobin level is required for elective safe surgery. Joergenson and Smith also noticed in their study a higher incidence of abdomen wound dehiscence in patients having anemia¹³.

The prevalence of hypoproteinemia in the study population was 63%. This observation is comparable to reports by Wolff⁸, Alexander and Pavdden⁹ and Keill et al¹¹ that 62%, 71% and 85% of their respective wound dehiscence were associated with hypoproteinemia. Every effort should be made to correct these nutrient deficiencies in the preoperative period before planned surgery.

The role of chronic comorbidities in causing wound disruption was also studied. Important among them is diabetes mellitus. The clean wound infection rate is higher in diabetic patients (11%) than in the general patient population¹⁴. A convincing result could not be arrived at from the present study due to its retrospective nature.

Another important predisposing factor is obesity. Bucknall et al⁸ described a higher risk of wound failure in obese patients owing to increased intraabdominal pressure, reduced respiratory reserve, higher rate of pulmonary complications, and a greater infection rate in adipose tissue. 30% of the study subjects who developed dehiscence were obese.

In this study, 81% of wound dehiscence occurred in vertical midline

incisions, with the remaining patients had right subcostal (2%), transverse (4%) or McBurney's (13%) incisions. Parmar and Gohil et al¹⁵ describe various factors which hold midline incision at a higher risk of dehiscence than other incisions.

Even with good patient selection and good surgical technique, wound dehiscence cannot be totally avoided as a host of postoperative events have a vital role to play in wound healing. The most important is postoperative infection which leads to sloughing out of the stitches and separates the rectus sheath. Wound infection is more common in emergency operations and patients presenting with peritonitis. In the present study, 76% of patients had evidence of infection, either limited to the wound or systemic. Fleischer et al¹⁶ noted that deep wound infection was a clear risk factor for dehiscence.

Post-operative cough also leads to high frequency of abdominal wound dehiscence. 68% of patients in this study had persistent cough in the postoperative period prior to the onset of dehiscence. Wolff reported severe paroxysmal coughing prior to wound disruption in over 60% of cases³.

CONCLUSION

Wound dehiscence is a serious sequel of impaired wound healing. It occurs most commonly above the age of 50 years, predominantly in males and with vertical midline abdominal incisions. Many factors can predispose to this grave complication. Knowledge of the more common mechanisms and how to avoid or overcome these hazards help to reduce the incidence of this dangerous complication. The more common factors contributing to wound disruption can be summarized as follows:

Presence of pre-operative anemia, hypoproteinemia, and cough favor high incidence of burst abdomen. Emergency surgery precludes adequate patient preparation and correction of preexisting abnormalities, and hence forms an independent risk factor. During operation, peritoneal contamination, improper choice of suture material and poor suturing technique predispose to burst abdomen. Post-operatively, unusual abdominal wall strain from persistent cough, vomiting, abdominal distention, uncontrolled wound infection, ascites and bowel leakage attribute to the development of burst abdomen.

Prompt and early diagnosis of abdominal wound dehiscence and proper treatment decrease morbidity and mortality. If the above predisposing factors are well understood before doing any abdominal surgery, the present incidence and mortality rates can be reduced further.

Abdominal wound dehiscence is as old as surgery. Predisposing factors are either patient or surgeon related. Despite several incisions and suture materials, controversy remains, with no consensus on the ideal methods or materials for closure of abdominal wounds to prevent dehiscence. At best, the incidence of dehiscence can be reduced.

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