

A Study of Abdominal Wound Dehiscence in Adults.

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Abstract

Background: Wound dehiscence is described as partial or complete disruption of an abdominal wound closure with or without protrusion and evisceration of abdominal contents. Burst abdomen is said to be partial when one or more layers have separated but either the skin or the peritoneum remains intact or complete when all layers of the abdominal wall have burst apart & this may or may not be associated with protrusion of viscera.

Methods: Hospital based prospective study conducted on post operative AWD between 15 January 2018 to 15 July 2019 in the Department of General Surgery at S.P. Medical College & Hospital.

Results: Various co-morbid conditions such as hypoproteinaemia (71.2%), anaemia (64.4%), uraemia (35.6%), hyperbilirubinemia (21.9%), diabetes mellitus (13.6%), COPD (9.5%) were associated with AWD. Among various operative risk factors perforation peritonitis (45.3%), emergency surgery (72.7%) And either contaminated or dirty wound (69.9%) were more common.

Conclusion: Various co-morbid conditions such as hypoproteinaemia, anaemia, uraemia, hyperbilirubinemia, diabetes mellitus, COPD were associated with AWD.

Keywords: AWD, COPD, Co-morbid.

Introduction

Wound dehiscence is described as partial or complete disruption of an abdominal wound closure with or without protrusion and evisceration of abdominal contents. Burst abdomen is said to be partial when one or more layers have separated but either the skin or the peritoneum remains intact or complete when all layers of the abdominal wall have burst apart & this may or may not be associated with protrusion of viscera¹.

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.²

Dehiscence of abdominal wound mortality rates reported as high as 15% - 45%.³ the incidence is ranged from 0.4% to 3.5% in all laparotomies.⁴ Whereas our

country data stated still higher frequency of burst abdomen with overall rate of 4.8% and 6.6%. Abdominal wound dehiscence is the disruption of laparotomy wound occurring usually between 5th to 8th post-operative days. Wound dehiscence is described as partial or complete disruption of an abdominal wound closure with or without protrusion of abdominal contents. Partial wound dehiscence is defined by separation of facial edges without evisceration and occasionally, fibrin covered intestinal loops. Complete wound dehiscence is defined as full separation of fascia and skin with evisceration of intestinal loops.

Our institute is also facing the problem of burst abdomen frequently. There is paucity of data over the frequency, risk factors and management of burst abdomen in tertiary care centers. Thus in this study we determine the prevalence of abdominal wound dehiscence with different risk factors, co morbidities and their effective management.

Materials & Method

Study design: Hospital based prospective study.

Study duration: This clinical study included post operative AWD between 15 January 2018 to 15 July 2019 in the Department of General Surgery at S.P. Medical College & Hospital.

Study place: Department of General Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: All patients who have developed wound dehiscence after midline abdominal incisions with or without abdominal evisceration at Department of general Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Sample size: all patients reporting to the General Surgery dept. within study duration and eligible as per inclusion criteria will be included in the study.

Inclusion Criteria

- Patients of age > 18 years and of either sex who have developed abdominal wound dehiscence.
- All patients who have developed wound dehiscence after midline abdominal incisions.
- Patients who have undergone either emergency or elective abdominal operations and developed wound dehiscence.

Exclusion criteria

- All patients with incisional Hernia.
- Female patients who developed wound dehiscence after any gynaecological procedures.

Study Methodology

In this study all cases which developed abdominal wound dehiscence after midline abdominal incisions with or without abdominal evisceration. In each patient, a detailed history of the disease was taken. Detailed history was taken in the form of elaboration of origin, duration and progress of the illness, past history and treatment, associated diseases, significant risk factors like anaemia, malnutrition, obesity, chronic cough, smoking, alcoholism will be noted. The patients was diagnosed on the basis of clinical symptoms, physical examination, haematological investigations like haemoglobin, serum protein, blood sugar, serum creatinine, blood urea and radiological investigations like x-ray of chest and abdomen (Erect & Supine) and ultrasonography. Details regarding the clinical diagnosis, whether the operation was conducted in emergency or electively, type of incision taken was noted. Intraoperative findings was noted and the type of surgical procedure done will also be recorded. Rectus sheath closure done in a continuous manner using absorbable suture material was also be noted. The subjects were followed after laparotomy till their wound healed or abdominal wound dehiscence

occurred. Post operative ICU stay, Wound infection, Timing of dehiscence, Post operative cough/abdominal distension were also noted. Type of dehiscence will be recorded.

Data analysis

Data was recorded on a Performa. The data analysis was computer based; SPSS-22 was used for analysis.

Observations and Results

In this study majority of patients belongs to age group between 21-30 years, youngest patient was 18-year-old and oldest was 78 years old. The mean age of patients was 47.83±19.38 years. Out of 73 cases 59 (80.82%) were males and 14 (19.18%) were females. Male : Female ratio was approximately 4:1. We observed that in this study 35.6% patient were having serum creatinine level more than 2 mg/dl. 21.9%(16/73) patients were having hyperbilirubinemia (total serum bilirubin level > 2 mg/dl) as a risk factor.13.6% patients were diabetic and 9.5% patients were having COPD. Most of the patients having more than one comorbid condition. In this study majority of patients who developed abdominal wound dehiscence were anaemic. 64.4% patients (47/73) were having hemoglobin (Hb) level less than 10 gm%.

Table 1: Distribution of patients on basis of serum albumin levels

Serum Albumin (mg/dl)	No. of cases	Percentage
>3.0	21	28.8
2.0-2.9	17	23.3
<2.0	35	47.9

71.2% (52/73) patients who had AWD were having hypoproteinemia (serum albumin less than 3 mg/dl). 35 out of these 52 patients were having serum albumin level less than 2 mg/dl.

Table 2: Distribution of patients on basis of primary disease leading to burst abdomen

Disease	No. of cases	Percentage
Perforation peritonitis	33	45.3
Obstruction	15	20.6
Tumor	9	12.3
Trauma	8	10.9
Necrotizing Pancreatitis	5	6.8
UGIB	3	4.1

Our study shows that majority of patients i.e. 45.3% (33/73) were having underlying perforation peritonitis as a primary cause for exploratory laparotomy. Other causes were obstruction in 20.6 %, blunt trauma abdomen causing visceral injury in 10.9%, tumor in 12.3%, upper GI bleed in 4.1%, Necrotising pancreatitis in 6.8% cases and one case presented with ulcerative colitis who developed AWD.

Table 3: Distribution of patients on basis of type of surgery

Type	No. of cases	Percentage
Elective	20	27.3
Emergency	53	72.7

The incidence of abdominal wound dehiscence was very high in patients who were operated in emergency. 72.7% patients (53/73) who developed abdominal wound dehiscence were operated in emergency.

Table 4: Distribution of patients on basis of type of surgical wound

Type of surgical wound	No of cases	Percentage
Clean	7	9.6
Clean contaminated	15	20.5
Contaminated	12	16.5
Dirty	39	53.4

In this study group, more than half of patients who developed abdominal wound dehiscence were having dirty wound. Abdominal wound dehiscence incidence were approximately 7 times higher in patients who were having either contaminated or dirty wounds (69.8%) as compared to those with clean wounds (9.6%).

Table 5: Distribution of patients on basis of type of dehiscence

Type of dehiscence	No. of cases	Percentage
Partial	22	30.1
Complete	51	69.9

69.9% patients (51/73) developed complete wound dehiscence while 30.1% (22/73) patients developed partial dehiscence.

Discussion

Various studies have observed old age as an independent risk factor for AWD. Almost similar results were observed in our study. The mean age in our study was 47.83±19.38 years.

Mean age of AWD among various studies like in Maingot⁵ Wolff et al⁶ is 45,45 years respectively. And in present study mean age of AWD is 47.83.

The explanation for this might lie in deterioration of the tissue repair mechanism in the elderly. Especially during the First few days of the wound healing process, the immune system plays a key role. Functional changes adversely affect the influx of cells and compounds that are essential for tissue repair.⁷

In our study 80.82% of patient who developed wound dehiscence were males. Almost similar sex ratio was seen in other studies also. In the study of Rodríguez-Hermosa JI et al⁸ incidence in male gender was 78.9% . The reason for this disadvantage is not entirely clear. One of the possible confounders may be smoking. Another explanation may be that men build up higher

abdominal wall tension than females. An increase in intra-abdominal pressure results in higher strain on the wound edges, causing the sutures to cut through the muscles and fascia. This explanation may also apply to ascites and coughing, causing increment in intra-abdominal pressure.⁹

In present study, it was noticed that various co-morbid conditions such as Diabetes Mellitus, COPD, Renal failure, Chronic liver disease, Hypoproteinaemia, anaemia were associated with abdominal wound dehiscence. In many patients, more than one factor leading to occurrence of burst abdomen.

We observed that 13.6% patients who developed wound dehiscence were diabetic. In a study by Garg R et al¹⁰ 8% of patients who developed burst abdomen were diabetic. Afzal S., Bashir M.M.² found Diabetes mellitus as another important risk factor for wound failure. However, van Ramshorst GH et al⁹ found no significant effect on the occurrence of abdominal wound dehiscence in diabetes mellitus patients. Diabetes mellitus can lead to the disaster by altering immune response and nutritional status. It also increases the susceptibility to wound infection.

In the present study 35.6% of patient had preoperative serum creatinine values more than 2 mg/dl. Garg R et al¹⁰ also reported a higher incidence of burst abdomen in patients having renal failure, 38% of patients were having uraemia. However, Afzal S, Bashir MM² reported little or no contribution of uraemia in wound dehiscence.

21.9% of patients were having associated jaundice (serum bilirubin level more than 2 mg/dl) in this study. Garg R et al¹⁰ reported 16% patients had serum bilirubin >1.0mg%. The range of bilirubin levels >1.0 mg% was 1.2 to 5.3, with a mean of 2.96 +/- 1.66. Afzal S, Bashir MM² reported jaundice may be an associated finding in

patients of burst abdomen. Jaundice was found to be an independent risk factor by van Ramshorst GH et al⁹

Conclusion

Various co-morbid conditions such as hypoproteinaemia, anaemia, uraemia, hyperbilirubinemia, diabetes mellitus, COPD were associated with AWD. Among various operative risk factors perforation peritonitis, emergency surgery and either contaminated or dirty wound were more common.

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