

A Study of Abdominal Wound Dehiscence in Adults- Etiology and Its Management.

Gajendra Saxena¹, Ashish Rai²

¹Professor, Department of Surgery, Churu Medical College, Churu, Rajasthan.

²Sr. Resident, Department of Surgery, S.P medical college, Bikaner, Rajasthan.

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ABSTRACT

Background: Abdominal wound dehiscence (AWD) is a severe postoperative complication associated with high mortality and morbidity. Prolonged hospital stay, high incidence of incisional hernia, and subsequent reoperations underline the severity of this complication. The goal of the underlying study was to evaluate possible risk factors for abdominal wound dehiscence and its management. **Methods:** This clinical study included post operative AWD between 15 January 2015 to 15 July 2016 in the department of general surgery at Dayanand Medical College & Hospital. The subjects were followed after laparotomy till their wound healed or abdominal wound dehiscence occurred. After taking informed consent complete record of all the patients were maintained and kept confidential. **Results:** The present study showed the incidence of AWD was 6.23% and majority of patients belonged to age group between 21-30 years. 68.3% patients who had AWD were having hypoproteinemia, majority of patients were anemic (63.4%) and 43.9% patients having underlying perforation peritonitis as a primary cause of exploratory laparotomy. There was higher incidence of AWD between 6th to 8th post operative days. 24.4% patients were managed conservatively by means of regular dressing for AWD and 7.3% patients who were high risk candidate for re-do-surgery bagota bag was applied. **Conclusion:** We concluded that incidence of abdominal wound dehiscence was 6.23% in our study. Hence, patients with various risk factors such as hyperbilirubinemia, hypoproteinaemia, anaemia and operative risk factor require more attention and special care to minimize the risk of occurrence.

Keywords: Abdominal wound dehiscence (AWD), Laparotomy, postoperative complication, management

INTRODUCTION

Abdominal wound dehiscence (AWD) is a severe postoperative complication associated with high mortality and morbidity. It has significant impact of health care cost, both for patients and hospitals.^[1] Wound dehiscence found when a wound fails to gain sufficient strength to withstand stresses placed upon it. The separation may occur when overwhelming forces break sutures, when absorbable sutures dissolve too quickly or when tight sutures cut through tissues. AWD has remained a puzzle that hasn't been solved by any surgical unit (i.e. no unit has reported 0% failure rate).

The abdominal wall disruption may be partial or complete. Partial disruption is when one or more layers have separated but the underlying sheath and peritoneum is intact. Complete disruption is when all the layers have disrupted leading to viscous

evisceration. The reported incidence continues to be 0.2% to 6% with associated mortality of 9% to 44%.^[2]

AWD can occur for a variety of reasons. A surgeon can perform a technically perfect operation in a patient who is severely compromised by the disease process and still have a complication. Similarly, surgical technical errors may account for this operative complication.

Prolonged hospital stay, high incidence of incisional hernia, and subsequent reoperations underline the severity of this complication. Although severe systemic factors are associated with increased risk, their clinical importance is over stated.^[2] The predisposing, contributing & causative factors have all been recognized early in the last century. But the incidence of AWD has not changed appreciable, because of high mortality, medical and surgical preventive measures are essential in primary pre-operative period.

Factors affecting wound healing in abdominal wall and those leading to its disruption have been discussed by various previous reports but no clear consensus could be made. Patient's age, sex, nutritional status, pre-operative medical condition like anaemia, diabetes, jaundice, renal failure, emergency or

Name & Address of Corresponding Author

Dr. Ashish Rai,
Sr. Resident, Department of Surgery,
S.P medical college,
Bikaner,
Rajasthan.

elective surgery, type and duration of surgery and post-operative wound infection or increase in intra-abdominal pressure etc. are the various factors leading to abdominal wall dehiscence.

Many retrospective studies have been performed to identify risk factors for this complication, often presenting conflicting results. Unfortunately, only a few of multivariate analysis has been performed in general on small numbers of patients.^[3,4] Various preoperative factors which are predisposing to this unpleasant, grave and tragic postoperative complication are brought into light. Also, operative and postoperative periods are studied in detail to prevent this complication.

As far as management is concern the based on closing abdominal wall again.^[5,6] Closing the abdominal wall can be hindered by intestinal edema and/or rigidity of the abdominal wall, intra-abdominal infections and/or presence of an intestinal fistula.^[6,7] There is neither clear evidence regarding the type of treatment that should be systemically used in these cases nor which therapeutic option provides better results. In this scenario, several alternatives have been suggested.^[8] Non-surgical treatment and delayed repair of a "planned incisional hernia" closure of the abdominal wall with or without associated retention sutures or the insertion of a prosthetic mesh. This has led us to study the frequency, risk factors and management of burst abdomen. The goal of the underlying study was to evaluate possible risk factors for abdominal wound dehiscence and its management.

MATERIALS AND METHODS

This clinical study included post operative AWD between 15 January 2015 to 15 July 2016 in the department of general surgery at Dayanand Medical College & Hospital. The subjects were followed after laparotomy till their wound healed or abdominal wound dehiscence occurred. After taking informed consent complete record of all the patients were maintained and kept confidential.

Inclusion criteria

All patients who have developed wound dehiscence after any abdominal incisions with or without abdominal evisceration.

Exclusion criteria

Patient less than 15 years of age and previous history of laparotomy.

RESULTS

The present study showed total no. of patient's laparotomy operated 658 during study period. Out of total patients, 41 patients have developed AWD. So incidence of AWD was 6.23%. In our study majority

of patients belonged to age group between 21-30 years [Table 1].

In our study show 68.3% patients who had AWD were having hypoproteinemia and majority of patients were anemic (63.4%) [Table 2] and 43.9% patients having underlying perforation peritonitis as a primary cause of exploratory laparotomy [Table 3]. There was higher incidence of AWD between 6th to 8th post operative days [Table 4].

The present study showed 68.3% patients developed complete wound dehiscence while 31.7% patients developed partial dehiscence [Table 5]. 24.4% patients were managed conservatively by means of regular dressing for AWD and 7.3% patients who were high risk candidate for re-do-surgery bagota bag was applied [Table 6].

Table 1: Age wise distribution of patients

Age (yrs)	No. of Cases	Percentage
11-20	1	2.4%
21-30	11	26.8%
31-40	6	14.6%
41-50	5	12.1%
51-60	4	9.7%
61-70	7	17.0%
>70	7	17.0%

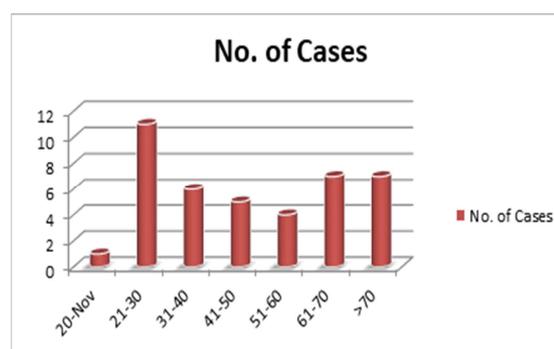


Figure 1: Age wise distribution of patients

Table 2: Distribution of patients on basis of investigation

Investigation	No. of cases	Percentage
Serum Albumin (mg/dl)	>3.0	13 (31.7%)
	2.0-2.9	11 (26.8%)
	<2.0	17 (41.5%)
Hemoglobin (gm%)	>10	15 (36.6%)
	<10	26 (63.4%)

Table 3: Distribution of patients on basis of primary disease leading to burst abdomen

Disease	No. of Cases	Percentage
Perforation peritonitis	18	43.9%
Obstruction	8	19.5%
Tumor	4	9.8%
UGIB	2	4.9%
Necrotising Pancreatitis	3	7.3%
Trauma	5	12.2%
Others	1	2.4%

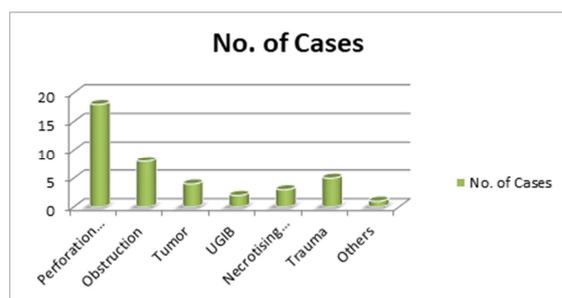


Figure 2: Distribution of patients on basis of primary disease leading to burst abdomen

Table 4: Distribution of patients on basis of timing of abdominal wound dehiscence

Time (Post op Day)	No. of Cases	Percentage
<5th	4	9.8%
5th	5	12.2%
6th	8	19.5%
7th	8	19.5%
8th	6	14.6%
9th	4	9.8%
10th	2	4.8%
>10th	4	9.8%

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

Type of dehiscence	No. of Cases	Percentage
Partial	13	31.7%
Complete	28	68.3%

Table 6: Distribution of patients on basis of management

Management	No. of Cases	Percentage
Conservative	10	24.4%
Secondary suturing	16	39.0%
Bagota Bag application	3	7.3%
Re-exploration	12	29.3%

DISCUSSION

The overall incidence of abdominal wound dehiscence in our study was 6.23%. Niggebrugge A and Hansen⁹ reported a failure rate of 1% (45/3768) in patients who had undergone midline laparotomy in a 5 year period. Wolff's study reported an incidence of 2.6%. In a study by Afzal S.^[10] Bashir M.M. total out of 430 patients,^[11] 35 patients had acute wound failure with a incidence of 8.13%. The possible explanations for such big discrepancy may be due to the fact that majority of the patients were done as emergency operations. Emergency surgery is a risk factor to wound disruption in that, being a lifesaving procedure there is hardly any time to adequately stabilize patients and more often not, the chronic health status may not be an immediate priority.

Krause R said that incidence of relaparotomy was high in training institutions and also depends on the type of health facility.^[12]

Various study done by Maingot,^[13] Wolff¹⁰, Garg R et al and Muneiah SN et al who observed that old age (45 years) as an independent risk factor for

AWD.^[14,15] Almost similar results were obtained in our study. The mean age in our study was 48.02 ± 19.39 years. 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.

The present study showed 31.7% of patient had preoperative serum albumin values more than 3 mg/dl. Garg R et al also reported a higher incidence of burst abdomen in patients having renal failure,^[14] 38% of patients were having uraemia. However, Afzal S and Bashir M.M reported little or no contribution of uraemia in wound dehiscence. In a study by Van Ramshorst Gh et al data on preoperative albumin levels were available for 83% of patients with abdominal wound dehiscence and 56% of controls.^[8,11] Albumin levels were below 3.5 mg/dl in 63% of patients with AWD and 34% of controls, which was significantly less ($P < 0.001$) and suggestive of an association between low albumin levels and development of AWD.

In our study majority of patients who developed AWD were anaemic. Similar results were observed by Muneiah SN et al out of 36 patients about 72% of patients had haemoglobin < 10 gm%. Simon JS and Lorna MW reports that mortality and morbidity were significantly increased in patients who undergone surgery with preoperative haemoglobin of less than 8g/dl and receive no transfusion.^[15,16] Low haemoglobin means poor oxygen supply to tissues and therefore poor tissue healing and inability to resist infection.

The majority of patients (43.9%) who developed AWD were having underlying perforation peritonitis as a primary cause for exploratory laparotomy. Muneiah SN et al (55.5%), Sinha A et al (36.84%) were diagnosed to have perforation peritonitis secondary to hollow viscus perforation.^[15,17]

More than 50% of patients developed AWD between 6th to 8th post operative days. Highest incidence was reported on 6th and 7th day 19.5% each. 9.8% developed wound dehiscence before 5th post operative day which might be due to technical failure. A study conducted at Osmania Medical College, India by Dr. Alapati Sivender, out of 50 cases, 29 (58%) cases reported burst between 6th to 9th post-operative day (POD) and 12 cases and 9 cases after 9th POD and before 6th POD respectively.^[18] Anielski et al reports average time of 6.5 days while Madsen et al reported the 6th POD.^[19,20] This explains the maximum incidence of burst abdomen on the 7th POD. We continue antibiotics for one week and on stopping them there might be relapse of infection and burst abdomen may thus occur later on. The patients with major abdominal surgery are in the bed having intravenous infusions up to 4 or 5 days. Then they begin to move

and try to pass stool. All this increases intra-abdominal pressure. The holding together capacity also become less and less until, after 10 days, stitches hardly have value.

In our study 68.3% patients developed complete wound dehiscence while 31.7% patients developed partial dehiscence. Wolff observed that majority of patients had complete burst abdomen.

Maingot's described that patients treated with conservative treatment had prolonged hospitalization and more morbidity as compared to patients treated by immediate re-suturing.^[13]

CONCLUSION

We concluded that incidence of abdominal wound dehiscence was 6.23% in our study. Hence, patients with various risk factors such as hyperbilirubinemia, hypoproteinaemia, anaemia and operative risk factor require more attention and special care to minimize the risk of occurrence. Early diagnosis of burst abdomen and aggressive treatment help in reducing morbidity and mortality.

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