



Predictors of Post-Laparotomy Abdominal Wound Dehiscence – A Study in 43 Cases

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Abstract

Abdominal wound dehiscence is a one of the severe post-operative complication, incidence of which ranges from 0.4 to 3.5%¹, and carries high morbidity and mortality. Clinical presentation of wound dehiscence tearing sensation by the patient to sudden high volume of pink colored fluid discharge, but it may occur without warning and evisceration make the diagnosis. A prospective study was carried out at VSS institute of Medical Science & research, Burla, Sambalpur, a tertiary referral centre and a teaching hospital in the Western Odisha from November 2014 to October, 2016. All patients undergone surgery with midline abdominal incision were provisional recruited for the study and out them 43 patients who developed wound dehiscence were taken up for the study after due clearance from the institutional ethical committee. They were evaluated for risk factors such as – age of the patient, sex of the patient, complete routine haematological investigation including renal function and liver function tests. Elderly patients, patients with anemia, malnutrition, pulmonary disease, associated malignancy and patients undergoing emergency surgical procedures are risk factors for wound dehiscence. Knowing the predictors for wound dehiscence will help to inform the patient and patient relatives, appropriate measures to optimise patient so as to reduce the morbidity and mortality.

Introduction

Wound dehiscence is described as partial or complete disruption of an abdominal wound closure with or without protrusion and evisceration of abdominal contents. The incidence of wound dehiscence varies from literature to literature ranges from 0.4-3.5%¹. It is one of the dreaded post-operative complications with high morbidity and mortality rates reported

as high as 45%¹. Clinical features varies from sudden drainage of relatively large amount of pink colored fluid with tearing sensation in some patients. It may occur without any warning sign and evisceration make the diagnosis obvious. A variety of risk factors known to be associated with wound dehiscence are advanced age, anemia, diabetes, uremia, hypoalbuminamia, wound infection, ascitis, obesity, steroid use, chronic

obstructive pulmonary disease, emergency operation and operation time >2.5 hours etc². The midline laparotomy, one of the common way of accessing peritoneal cavity has a high rate of wound dehiscence and incisional hernia as high as 16%³. Good knowledge of these risk factors are mandatory for prophylaxis of wound dehiscence and to take appropriate steps to reduces the incidence of wound dehiscence.

Material and Methods

A prospective study was carried out at VSS institute of Medical Science & Research, Burla, Sambalpur, a tertiary referral centre and a teaching hospital in the Western Odisha from November 2014 to October, 2016. All patients undergone surgery with midline abdominal incision were provisional recruited for the study and out them 43 patients who developed wound dehiscence were taken up for the study after due clearance from the institutional ethical committee. The patients under the age of 14 years and associated ventral hernia were excluded from the study. They were evaluated for risk factors such as – age of the patient, sex of the patient, complete routine haematological investigation including renal function and liver function tests. Elderly patients, anemia, malnutrition, uremia, diabetes, hypoproteinaemia, ascitis, steroid use, pulmonary disease, associated malignancy and patients undergoing emergency surgical procedures are risk factors for wound dehiscence. Detail clinical history, whether the surgery was conducted in elective or emergency set up, was noted. Intra-operative findings noted and classification of surgical wounds done accordingly. Type of surgical procedure undertaken and postoperative day of diagnosis of wound dehiscence was noted. The collected data was analysed and statistical analysis was made accordingly.

Results

Table No.1 Age distribution of the patients –Total no.43

Age in years	No. of cases	Percentage (%)
21-30	4	9.3
31-40	6	13.9
41-50	7	16.3
51-60	12	27.9
61-70	9	20.9
>70	5	11.6

In the present study the age group was from 20 years to > 70 years. The youngest patient was of the age of 22 years old and the eldest patient was 84 years. Out of 43 patients 12 (27.9%) patients were in the age group of 51-60 and the second majority 9 (20.9%) patients were in the age group of 61-70 years and the mean age of the patients was 51.4 years(SD =12.3)

Table No. 2 Sex distribution –Total no. 43

Sex	No. of cases	Percentage (%)
Male	32	74.4
Female	11	25.6

In the present study majority of the patients 32(74.4%) were male patients and females were 11(25.6%). Male: Female ratio in our study was 2.9: 1.

Table No. 3. Frequency of wound dehiscence according body mass index (BMI)

BMI	No of cases	Percentage (%)
<25	14	32.6
>25	29	67.4

Body mass index (BMI) more than 25 was taken as normal. Out of 43 patients 29 had BMI >25(67.4%). However out of the 43 patients 14 (32.6%) had BMI less than 25.

Table No .4. Associated co-morbid illness

Co-morbid illness	No. of cases	Percentage (%)
Anemia	24	55.8
Hypertension	21	48.8
Diabetes Mellitus	15	34.9
Malnutrition	14	32.6
Pulmonary disease	9	20.9
CRF	8	18.6
Intraabdominal infection	27	62.8
Associated malignancy	3	6.9

Out of 43 patients 24 (55.8%) were having anemia, hypertension in 21 (48.8%) patients,

intra-abdominal infection in 27(62.8%) patients, and Diabetes was noted in 15(34.9%) patients. Other factors associated were Malnutrition 14(32.6%), Pulmonary diseases 9(20.9%), Chronic renal failure 8(18.6%) and associated malignancy 3(6.9%) patients.

Table No. 5 Surgical procedures undertaken

Surgical procedures	No. of cases	Percentage (%)
Elective	7	16.3
Emergency	36	83.7

In the present study out of the 43 patients 36 (83.7%) cases were operated as emergency surgical procedure and 7 (16.3%) cases as elective surgery. Wound dehiscence was more noted in the emergency surgical procedure group.

Table No. 6 Underlying pathology in wound dehiscence

Diseases	No. of cases	Percentage (%)
Hollow viscous perforation	27	62.8
Duodenal perforation	18	41.9
Gastric perforation	4	9.3
Ileal perforation	3	6.9
Appendicular perforation	2	4.7
Large gut obstruction	9	20.9
Blunt trauma abdomen	4	9.3
Malignancy	3	6.9

Out of 43 patients 27(62.8%) had peritonitis secondary to hollow viscous perforation. Large gut obstruction was seen in 9(20.9%) patients, blunt trauma abdomen in 4(9.3%) patients and associated malignancy was noted in 3(6.9%) patients. Most common pathology associated in our study was hollow viscous perforation (62.8%).

Table No.7.Wound dehiscence management

Wound dehiscence type	No. of cases	Percentage (%)	Management
Partial	30 (16+14)	69.8	16-conservative management – healing by secondary intention 14 –secondary suturing
Complete	13	30.2	Tension suturing

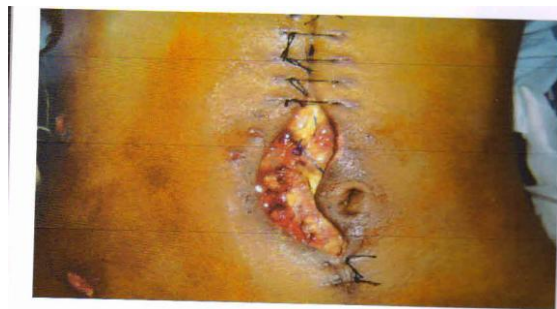


Fig 1: partial wound dehiscence in a case of acute intestinal obstruction



Fig 2: complete wound dehiscence in a case of illeal perforation

Out of 43 patients 30(69.8%) had partial wound dehiscence and 13(30.2%) had complete wound dehiscence. Patients with partial wound dehiscence were managed conservatively or by secondary suturing. However patients with complete wound dehiscence had to undergo tension suturing.

Table No. 8. Hospitalization duration

Range of stay	10 -34 days
Average hospital stay	19.68 days

Range of hospitalization varied from 10 days to 34 days in our study. Average hospital stay was 19.68 days in our patients.

Table No. 9 Survival and mortality

Total no. of patients	Survival	Mortality
43	42	1

Out of the 43 patients 1(2.3%) patient died in our study. It was associated with anemia, malnutrition, pyoperitoneum secondary to peptic perforation with post-operative lower respiratory infection. Complete wound dehiscence was noted on 7th post-operative day, tension suturing was done. The patient expired on 13th post-operative day.

Discussion

Abdominal wound dehiscence is one of the dreaded post-operative complication with high morbidity and mortality. There are many known patient factors and surgeon factors to predict the possibility of wound dehiscence. The present prospective study was carried out to establish the different causes of wound dehiscence.

Age of the patients –Bryan M Burt et al, 2007 in a study of 3500 abdominal laparotomy found that the mean age was 69.5 years². In a study conducted by Alapati S et al, 2014, showed that the majority of the patients belonged to the age group of 51-60 year, the youngest patient was 25 years, the oldest patient was 79 years of age and the mean age of patients affected was 52.78 years⁴. In our study out of 43 patients 12 (27.9%) patients were in the age group of 51-60 and the second majority 9 (20.9%) patients were in the age group of 61-70 years, which corroborates the study of Alapati S et al.

Sex distribution –In a study conducted by Waqer S et al, 2005 found the incidence of abdominal wound dehiscence was found more commonly in male gender -60%⁵. Study conducted S. Naga et al, 2015 in 36 patients and found the male dominance was 75%⁶. In a study by Gabrielle H et al, 2010, found 272(75%) male and 91(25%) female patients¹¹. In the present study majority of the patients 32(74.4%) were male patients and females were 11(25.6%), which corroborates with the study of S. Naga et al. The male predominance may due to the higher incidence of peptic ulcer perforation and intestinal obstruction in male sex (78%)⁷.

Body Mass Index in wound dehiscence –In a study conducted by Garg et al, 2015, out of 50 patients 16(32%) were found tube obese (BMI >25)¹². A study by Naga M et al, 2015 showed that 26(72.2%) patients were having BMI>25 and 10(27.8%) patients were having BMI<25⁷. In our study out of 43 patients 29 had BMI >25(67.4%) and 14 (32.6%) had BMI less than 25. This is comparable with the study of Naga M et al.

Surgical procedure –emergency vs elective - In a study conducted by Waqer S et al, 2007 found the incidence of abdominal wound dehiscence was found in patients who had undergone emergency surgical procedure accounted for 60%⁶. Study conducted by Waqer et al, 2005, showed that 71.4% of the patients who developed abdominal wound dehiscence had undergone surgery in emergency⁵. Wound dehiscence was more noted in the emergency surgical procedure group in our study in 36(83.7%) out of the total of 43 patients which is slight higher than the study of Waqer et al.

Co-morbid condition at the time of admission –in a study by Afzal S et al, 2008, the main factors associated with wound dehiscence were anemia, obesity, hypoproteinaemia, diabetes mellitus, chronic liver disease etc¹. In a study by Spiiotis J et al, 2007, 3500 abdominal laparotomy, where anemia, uremia, sepsis, ascitis, steroid use, hypertension were risk factors acting as determinants for wound dehiscence⁷. A study by Alapati S et al, 2014, in 50 cases of wound dehiscence, noted that 31(62%) had hypoalbuminaemia, 18(36%) patients had anemia, 16(32%) patients had hyperbilirubinaemia, 18(36%) had elevated renal parameters⁵. In our study out of 43 patients 24 (55.8%) were having anemia, hypertension in 21 (48.8%) patients, intra-abdominal infection in 27(62.8%) patients, and Diabetes was noted in 15(34.9%) patients. Other factors associated were Malnutrition 14(32.6%), Pulmonary diseases 9(20.9%), Chronic renal failure 8(18.6%) and associated malignancy 3(6.9%). Our study is comparable with the findings of Alapati S et al.

Different procedures leading to abdominal wound dehiscence –In a study by Granam DJ et al, 1998, on 107 patients with abdominal wound dehiscence showed that patients with intra-abdominal infection likely to have undergone an emergency operation, an operation on colon, operation with higher wound classification in these situation wound dehiscence was more common⁸. In a study conducted by Alapati S et al, 2014, out of 50 cases

perforation closure was performed in 14(28%) cases, resection anastomosis in 13(26%) cases, stoma was made in 17(34%) cases and other procedures like gastrojejunostomy, mesenteric tear repair, stricturoplasty etc.⁵. In our study out of 43 patients 27(62.8%) had peritonitis secondary to hollow viscous perforation. Large gut obstruction was seen in 9(20.9%) patients, blunt trauma abdomen in 4(9.3%) patients and associated malignancy was noted in 3(6.9%) patients. Our study is comparable with the study of Granam DJ et al and Alapati S et al.

Management of wound dehiscence –In a study Kapoor KK et al, 2017, out of 60 patients 48 patients were partial wound dehiscence, treated with conservative management and secondary suturing. Rest 12 patients were having complete wound dehiscence, were managed with tension suturing and mesh repair⁹. In our study out of 43 patients 30(69.8%) had partial wound dehiscence and 13(%) had complete wound dehiscence. Patients with partial wound dehiscence were managed conservatively or by secondary suturing. However patients with complete wound dehiscence had to undergo tension suturing.



Fig 3: complete wound dehiscence managed with tension suture.

Hospitalization duration - In a study Kapoor KK et al, 2017, out of 60 patient's range of stay in the hospital was 5-36 days and with an average stay of 18days⁹. In our study the range of hospitalization varied from 10 days to 34 days in our study. Average hospital stay was 19.68 days in our patients, which is at par with the study of Kapoor KK et al.

Survival and mortality –Mortality in various earlier literatures shows mortality of 15-24%.

Fleischer JC et al, 2000, stated it to be 36%¹⁰. In our study out of the 43 patients 1 patient died. The mortality rate in our study was 2.3%.

Conclusion

Abdominal wound dehiscence causes significant morbidity and mortality. Old age, male sex, obesity, anemia, diabetes mellitus, hypertension, malnutrition, peritoneal sepsis due to hollow viscous perforation, intestinal obstruction, pulmonary diseases, associated malignancy act as determinant for wound dehiscence. Proper identification of the predictors of wound dehiscence, improving general condition of the patient, treating respiratory pathology will reduce the incidence wound dehiscence to a great extent.

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