

CLINICAL STUDY OF POST LAPAROTOMY WOUND DEHISCENCEChanda Ramanachalam¹, P. V. Durga Rani², K. Appa Rao³¹Assistant Professor, Department of General Surgery, Siddhartha Medical College, Vijayawada, Andhra Pradesh.²Assistant Professor, Department of General Surgery, Siddhartha Medical College, Vijayawada, Andhra Pradesh.³Professor, Department of General Surgery, Siddhartha Medical College, Vijayawada, Andhra Pradesh.**ABSTRACT****BACKGROUND**

The aim of the study is to-

1. Assess the association and prevalence of risk factors involved in causing post laparotomy wound dehiscence.
2. Identify the type of disease involved in causing abdominal wound dehiscence.
3. Effectively manage cases of wound dehiscence.

MATERIALS AND METHODS

Total 50 cases clinically presenting as gaping of abdominal wound and discharge from the site during the period of October 2014 to April 2016 were taken for study. Patients presenting with abdominal wound dehiscence after undergoing elective or emergency operation Each case was examined clinically and properly in systematic manner and an elaborative study of history based on chief complaints, significant risk factors, investigations, time and type of surgery performed and postoperative events and day of onset of wound dehiscence.

RESULTS

Males outnumbered females with 64% males and 36% females. Patients in the age group of 41-50 years and 51-60 years found to have highest incidence of abdominal wound dehiscence. Mean age of the patients affected was 48.02 years. Incidence of abdominal wound dehiscence is more common in patients with peritonitis due to duodenal and appendicular perforation than in case of intestinal obstruction. Incidence of abdominal wound dehiscence is more common in patients who are operated in emergency than elective (35:15). Surgical procedures, which included perforation closure carried higher incidence of wound dehiscence. Patients operated with midline incision carried higher risk for wound dehiscence than those operated with paramedian incisions. Incidence of abdominal wound dehiscence is more common in patients having their BMI >25 and anaemia (Hb% <10 g%). Average stay was 22 days, which increased both economic burden on patient and hospital. Out of 50 cases, 48 survivals and 2 were mortals. Partial wound dehiscence was conservative management, i.e. healing by secondary intention was observed in 32 patients and 8 patients had undergone secondary suturings, 10 patients had undergone complete wound dehiscence, i.e. tension suturing.

CONCLUSION

Surgical factors like midline incisions, improper suture technique and improper aseptic precautions may lead to wound infection and then wound dehiscence.

KEYWORDS

Laparotomy, Wound Dehiscence, Incisional Hernia.

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BACKGROUND

Abdominal wound dehiscence (burst abdomen, fascial dehiscence) is a severe postoperative complication with mortality rates reported as high as 45%.¹⁻³ Abdominal wound dehiscence can result in evisceration, which require immediate treatment. Prolonged hospital stay, high

incidence of incisional hernia and subsequent reoperations underline the severity of this complication.

Wound dehiscence is described as partial or complete disruption of an abdominal wound closure with or without protrusion and evisceration of abdominal contents. There are two basic types of wound dehiscence, partial or complete, depending on the extent of separation. In partial dehiscence, only the superficial layers or part of the tissue layers reopen. In complete wound dehiscence, all layers of the wound thickness are separated revealing the underlying tissue and organs, which may protrude out of the separated wound. This can be seen in some cases of abdominal wound dehiscence. Conditions associated with increased risk of wound dehiscence are anaemia, hypoalbuminaemia, malnutrition, malignancy, jaundice, obesity and diabetes,

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male gender, elderly patients and specific surgical procedures as colon surgery or emergency laparotomy.⁴

Despite advances in perioperative care and suture materials, incidence and mortality rates with regards to abdominal wound dehiscence have not significantly changed over the past decades. This maybe attributable to increasing incidences of risk factors within patient populations outweighing the benefits of technical achievements. Several mainly retrospective studies have been performed to identify risk factors for this complication often presenting conflicting results. Unfortunately, multivariate analysis has only been performed in a minority of studies and in general on small numbers of patients. Mortality and morbidity in the form of prolonged hospital stay, increased economic burden on healthcare resources and long-term complication of incisional hernia can be reduced by highlighting the risk factors for wound dehiscence, the incidence rate and remedial measures to prevent or reduce the incidence of wound dehiscence. The goal of the underlying study was to evaluate possible risk factors for abdominal wound dehiscence and to design a risk model based on independent risk factors. This model can be used to assess the risk for individual patients and it may prove useful for prevention strategies in clinical studies, e.g. development of alternative closure techniques in high-risk patients.

MATERIALS AND METHODS

A total of 50 cases clinically presenting as gaping of abdominal wound and discharge from the site during the period of October 2014 to April 2016 were taken up for the study. Each case was examined clinically and history was taken based on chief complaints, significant risk factors, investigations, time and type of surgery performed and postoperative events and day of onset of wound dehiscence were noted and managed cases as per protocol.

Inclusion Criteria

Patients aged >14 yrs. presenting with abdominal wound dehiscence after undergoing elective or emergency operation.

Exclusion Criteria

Patients less than 14 years, cases of trauma, patients who refuse investigation and treatment.

An elaborative study of these cases with regard to date of admission, clinical history, whether the operation was conducted as an emergency or electively, type of incision taken were all noted. Mode of presentation, significant risk factors, time and type of surgery, study of diagnosis and day of diagnosis of wound dehiscence till the patient is discharged from the hospital were recorded. In history, details regarding presenting complaints, duration, associated diseases, significant risk factors like anaemia, malnutrition, obesity, chronic cough, smoking and alcoholism were noted.

RESULTS

Age Group	Number of Cases	Percentage
21-30	5	10
31-40	10	20
41-50	13	26
51-60	16	32
61-70	5	10
71-80	1	2
Total	50	100
Gender	Number of Cases	Percentage
Male	32	64
Female	18	36
Total	50	100

Table 1. Shows Incidence of Abdominal Wound Dehiscence in Different Age Groups in Different Gender

In this study, majority of patients belonged to the age group between 51-60 years, youngest patient was 21 year old and oldest patient was 74 years. The mean age of patients affected was 48.02 yrs. (S.D=13.7). Out of 50 cases, 64% were males and 36% were females.

Conditions	Number of Cases	Percentage	
Diabetes	20	40	
Hypertension	22	44	
Pulmonary disease	14	28	
Malnutrition	36	72	
Anaemia	25	50	
Drug history	2	4	
CRF	10	20	
Malignancy	8	16	
Intra-abdominal infection	40	80	
Radiation			
	Number of Cases	Percentage	
Surgery	Elective	15	30
	Emergency	35	70
	Total	50	100
Type of Incision	Number of Cases	Total	
Upper midline	10	36	
Midline	22		
Lower midline	4		
Right upper paramedian	4	8	
Right lower paramedian	4		
McBurney's	6	6	
Total	50	50	

Table 2. Shows Co-Morbid Condition at the Time of Admission, Effect of Emergency Surgery, Frequency of Abdominal Dehiscence in Relation to Type of Incision

Diabetes, hypertension and anaemia are important factors for wound dehiscence. In the present study, out of 50 cases, 35 cases were operated as emergency surgery and 15 cases were operated as elective surgery. Out of 50 cases, 36 cases (72%) were operated with midline incision and 8 cases (16%) were operated with paramedian incision.

Procedure	Number of Cases
Perforation closure	28
Resection and anastomosis	9
Appendectomy	7
Others	6
Total	50
Diagnosis	Number of Cases
Hollow viscous perforation	20
Duodenal ulcer	10
Others	4
Intestinal obstruction	6
Malignancy	4
Blunt trauma abdomen	0
Appendicitis	6
Total	50
BMI	Number of Cases
>25	24
<25	26

Table 3. Shows Various Abdominal Procedures Leading to Abdominal Wound Dehiscence, According to Intra-Abdominal Pathology, According to BMI

Table 3 shows that out of 50 cases, perforation closure was performed for 28 cases, resection and anastomosis was performed for 9 cases, appendectomy was performed for 7 cases and other procedures like splenectomy, mesenteric tear repair, adhesiolysis, stricturoplasty was performed in 6 cases. Out of 50 cases, 20 patients had hollow viscous perforation, 6 had intestinal obstruction and 4 were malignant. Out of 50 cases, 24 had BMI >25 and 26 had BMI <25.

Haemoglobin Percentage	Number of Cases	Percentage
>10	27	54
<10	23	46
LFT	Number of Cases	Percentage
Hypoproteinaemia (<2.9 g/dL)	21	42
Normal	29	58

Table 4. Shows Abdominal Wound Dehiscence in Relation to Anaemia, in Relation to Hypoproteinaemia, in Relation to Serum Electrolyte

Table 4 shows out of 50 cases, 27 patients had Hb% >10 and 23 patients had Hb% <10. Out of 50 cases, 16 patients had deranged serum electrolytes, 16 patients had hypokalaemia and 16 patients had Hyponatraemia (HN). Hypokalaemia (HK) is an important cause of postop paralytic ileus and abdominal distension. Out of 50 cases, 20 patients had elevated renal parameters. Average stay was 22, which increases economic burden both on hospital and patients. Range of stay was 15 to 30 days. Mortality was mainly due to postoperative complication like septicaemia and respiratory tract infection. Out of 50 cases, 48 survivals and 2 were mortals. Partial wound dehiscence was conservative management, i.e. healing by secondary intention was observed in 32 patients and 8 patients had

undergone secondary suturings, 10 patients had undergone complete wound dehiscence, i.e. tension suturing.

DISCUSSION

Many studies have been conducted related to wound dehiscence. Study carried out at Nishtar Hospital, Multan, between May 1998 to May 2000 on 406 patients who underwent laparotomy shows 32 patients developed wound dehiscence, majority of patients suffered from underlying malignancy, 43 patients had hypoalbuminaemia, emergency surgery showed higher incidence of abdominal wound dehiscence⁵ and 21 manifested abdominal wound dehiscence because of infection. Other significant risk factors are age >55 yrs. male gender, jaundice, uraemia and technique of closure. During 5-year period from January 1984 to January 1989, 2761 major intra-abdominal operations were performed at Long Island Jewish Medical Centre. Among these 31 patients, i.e. 1% developed fascial wound dehiscence, serosanguineous drainage was noted from the wound prior to the dehiscence is 21 patients (67%), disruption occurred on an average of 11.1 days postoperatively.⁶ During 5-year period from January 1989 to December 1992, 48 patients developed wound dehiscence after midline laparotomy at Oulu University Hospital. Two patients (4%) died within 30 days and 3 (6%) within 90 days after discharge. Mean hospital stay was 25 ± 15 days.⁷ There were 31 (65%) patients with preoperative hypoalbuminaemia. Other risk factors included anaemia, malnutrition, chronic lung disease and emergency procedure. Another study carried out at Department of General Surgery, Pakistan Institute of Medical Sciences, Islamabad, from January 1, 2002, to December 31, 2002, 117 patients undergoing laparotomy 2 with midline incision were included. Results showed that 7 out of 117 (5.9%) patients developed wound dehiscence. 5 of them were (4.2%) operated in emergency. Other risk factors include malignancy, obstructive jaundice, peritonitis and wound infection. In a study conducted in Department of Surgical Gastroenterology, University of Copenhagen, Hvidovre Hospital in 2001 shows that the incidence of abdominal wound dehiscence and burst abdomen is more common in patients with vertical incision than in those with transverse incision (p=0.0001).⁸ In a study conducted between 2007, 3500 abdominal laparotomies were performed in Department of Surgery of Mesologgi General Hospital and Urban Community Teaching Hospital of 150 beds showed the incidence of abdominal wound dehiscence is more common in male gender (60%).⁹ Mean presentation of abdominal wound dehiscence was at postoperative day with 90% of all cases presenting before the 15th postoperative day. Mean hospital stay was 36 days. The main risk factors were old age (20%), HB (17%), obesity (13%), wound infection (25%), etc. The number of patients with wound dehiscence increased with an increase in the number of risk factors. The risk factors of wound dehiscence can be predicted early and their number can be decreased before and after surgery by an experienced surgeon leading to lowered incidence of wound failure. In a study conducted

in 2007, 3500 abdominal laparotomies were performed in Department of Surgery of Mesologgi General Hospital and Urban Community Teaching Hospital of 150 beds showed the incidence of abdominal wound dehiscence more commonly in males of 60%, the male predominance maybe due to higher incidence of peptic ulcer perforation and intestinal obstruction in males. In study by John Spiliotis et al, males 9 (60%), females 6 (40%); in Gabrielle H. Van Ramshorst et al study, males 272 (75%), females 91 (25%); in study by Freddy M. Pennix et al, males were 88 (75%), females were 29 (25%). A study conducted by Dr. Joseph Trueta, Spain, 12622 patients, who underwent laparotomy showed the mean age of patients with wound dehiscence was 70 years.¹⁰ In a study conducted between 2007, 3500 abdominal laparotomies were performed in Department of Surgery of Mesologgi General Hospital and Urban Community Teaching Hospital of 150 beds¹¹ showed the mean age of 69.5 years. In our study, the mean age of patients shown to be 47.1 years as the incidence of appendicular perforation and duodenal ulcer perforation is more common in this age group. In study conducted by S H Waqar et al, mean age was 39.67 years in John Spilitois et al study, 69.5 years; Cavit COL et al, 53 years. Study conducted on 107 patients with abdominal wound dehiscence over a period of 7 years in Department of Surgery, Case Western, Reserve University, Cleveland Veterans Affairs Medical Center USA showed that patients with intraabdominal infection were more likely to have undergone an emergency operations ($p < 0.02$), an operation on colon ($p < 0.005$) or an operation with higher wound classification ($p < 0.02$) and wound dehiscence is more common emergency operation and operations with higher wound classification. Study conducted at Pakistan institute of medical science showed that 71.4% of the patients who developed abdominal wound dehiscence had undergone surgery in emergency. In a study conducted between 2007, 3500 abdominal laparotomies were performed in Department of Surgery of Mesologgi¹¹ General Hospital and Urban Community Teaching Hospital of 150 beds showed that 60% of the patients operated who developed wound dehiscence were operated in emergency.

In study conducted by S H Waqar et al,⁹ 72% were operated in emergency and 28% were elective. In John Spilitois et al study, 60% were in emergency and 40% were elective. In Afzal et al⁴ study, 90% were in emergency and 10% were elective. Study conducted in Department of Surgical Gastroenterology, University of Copenhagen, Hvidovre Hospital in 2001 shows that incidence of wound dehiscence and burst abdomen is more common in patients with vertical incision than in those with transverse incision ($p = 0.0001$). In 50 cases, 36 cases (72%) were operated with midline incision and 8 cases (16%) were operated with paramedian incision. In a study carried out at Oula University Hospital, among 48 patients who developed wound dehiscence, 2 patients (4%) died. The mean hospital stay was 25.15 days. There were 31 (65%) patients with preoperative hypoalbuminaemia. Other risk factors were anaemia, malnutrition, chronic lung diseases

and emergency procedures. A study at Department of Surgery, Sundsvall County Hospital, Sweden, concluded overweight (BMI >25) as a risk factor for wound infection, but these effects maybe¹² eliminated if patients are sutured with a suture length to wound length ratio of 4-4.9. Study conducted at Long Island Jewish Medical Centre showed the average postoperative day of abdominal wound dehiscence to be 11% postoperatively. In Gabrielle Van Ramshorst study, mean postop day was 9th day. It ranged from 0-32 days. In John Spiliotis study, mean postop day was 9th day and ranged from 6th to 15th day.⁷ Other risk factors for development of abdominal wound dehiscence include chronic cough, wound infection and poor surgical technique.

CONCLUSION

Significant risk factors for the development of postoperative abdominal wound dehiscence are- Patient factors like older age group, male sex, anaemia, malnutrition, obesity, patients with peritonitis due to bowel perforation, intestinal obstruction, those who have undergone operation in emergency and those who have undergone perforation closure, resection and anastomosis. Surgeon factors like midline incisions, improper suture technique and improper aseptic precautions, which may lead to wound infection and then wound dehiscence.

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