Abdominal Wound Dehiscence in Emergency Laparatomy

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ABSTRACT

INTRODUCTION: Abdominal wound dehiscence is a very stressful situation for the patient as well as the surgical team. This study was carried out to identify risk factors for wound dehiscence after emergency laparotomy, also to reduce hospital stay, psychosocial embarrassment , cost of treatment and mortality and morbidity resulting from wound dehiscence.

METHOD: A prospective observational study was conducted over 60 consecutive patients undergoing emergency laparotomy. The rate of wound dehiscence, patient factors (like jaundice, malnutrition, COPD, diabetes) and postoperative factors (like wound infection, vomiting or cough) were noted, analyzed and reviewed with relevant literature.

RESULT: The mean age of our patients was 39.8 years (range 15 – 72). Male to female ratio was 3.29. Most wound dehiscence occurred in the age group 41-50 yrs. The overall rate of wound dehiscence was 10 %. Those patients who had cough or wound infection in the early post-operative period had statistically significant risk for wound dehiscence Those patients who had the risk factors like COPD, anemia or smoking had increased chances for wound dehiscence as compared to those without, P value = 0.005.

CONCLUSION: Overall rate of wound dehiscence was 10%. Rates of wound dehiscence had no relation to age and sex of the patient or to the site of pathology. The rates of wound dehiscence increased significantly as the operative time increased. Patients with cough or wound infection in the early post-operative period had statistically significant increased risk for wound dehiscence. Patients with COPD, anemia or smoking history had increased chances of wound dehiscence.

KEY WORDS: anemia, cough, emergency laparotomy, smoking, Wound dehiscence, wound infection,

INTRODUCTION

Wound dehiscence is defined as separation of the layers of a surgical wound; it may be partial or only superficial, or complete with separation of all layers and total disruption. Complete dehiscence of an abdominal wound usually leads to evisceration.

Wound dehiscence after laparotomy can be an especially distressing situation for the patient as well as the surgical team. Patients are subjected to the inconvenience of a discharging wound and even may require immediate operation and the later appearance of an incisional hernia, with increased morbidity and mortality. Other than the pathophysiological disturbance, the sight of intestine and other viscera through the laparotomy wound is a major psychological trauma to the patient. It affects the attendants by increasing the cost of treatment; and the hospital resources by increasing the health care cost due to prolonged hospital stay. Patient presents with a sudden, dramatic drainage of a relatively large volume of a clear, salmoncolored fluid precedes dehiscence in 25% of patients. More often, patients report a ripping sensation. Probing the wound with a sterile, cotton-tipped applicator or gloved finger may detect a partial dehiscence.

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Wound dehiscence is the end result of impaired wound healing and the consequence of interaction among multiple factors which vary from patient to patient. However, in general, these can be categorized as patient factors, disease & local wound factors and technical factors. Patient factors include old age, obesity, smoking, malnutrition, jaundice, anemia and co-morbidities like diabetes, chronic lung diseases, chronic renal failure, atherosclerosis and on immunosuppressive drugs. Wound infection, surgery for peritonitis and underlying malignancy are among the disease factors that increase the risk for dehiscence. Technical factors include use of inappropriate suture material, faulty suturing techniques and poor tissue handling. Post-operative factors like vomiting, excessive coughing, ileus and ascites that lead to increased intra abdominal pressure are also thought to contribute adversely.

The wound dehiscence rate reported in international literature varies from 1% to 2.6%1-5. Mortality rates associated with wound dehiscence reported in literature is 15-24%3. Fischer has reported a rate of 36%6.

Keeping in mind the obvious increased morbidity and mortality associated with abdominal wound dehiscence, this study was carried out to assess the incidence of this complication in our setup and to evaluate the role of various factors predisposing to it so that appropriate measures may be taken to reduce this dreadful complication.

METHOD

The prospective observational, hospital based study was carried out in Bir Hospital (BH) from January 2012 to March 2013. Patient and operation related preoperative, intra-operative and postoperative variables and in hospital mortality were also recorded for all cases. Patients aged 15 years and above undergoing emergency laparotomy through midline incision were included in the study. Patients undergoing reoperation and patients having previous history of wound dehiscence were excluded from the study. Prolene no. 1 suture with round body needle was used in all the cases for fascial closure and a continuous suturing technique was employed. Drains, when used, were brought out through a separate stab incision. Tension sutures were placed to avoid wound dehiscence especially in emergency laparotomy when abdominal closure was difficult.

Abdominal wound dehiscence, in this study, was defined as separation of all the layers of the wound leading to exposure of the visceral contents. Patients were observed from third post-operative day until removal of skin sutures or 30th post-operative day whichever occurred later. The diagnosis of abdominal wound dehiscence or burst abdomen was made by consultant surgeon of the respective unit.

Laboratory investigations were conducted including pus culture, Gram stain, serum albumin, hemoglobin and serum bilirubin.

Data was collected on a structured Proforma covering. Written informed consent was taken. Ethical clearance was obtained from the Institutional Review Board (IRB) of NAMS.

The statistical analysis was done using SPSS version 18. Chi square test was used to investigate statistical significance. Student's t test used to compare mean values. A p value less than 0.05 was considered statistically significant.

RESULT

A total of 60 consecutive patients undergoing emergency laparotomy through midline incision were studied.

The mean age of patients was 39.8 years (range 15 – 72). Most wound dehiscence occurred in the age group 41-50 yrs (P value=0.088). Most of our patients were male (M:F = 3.29). Out of 46 males, 5 had wound dehiscence (10.9 %) while 1 out of 6 female had wound dehiscence (7.1%). The incidence of wound dehiscence was 10 %.

Table 1. Distribution of wound dehiscence according to duration of surgery

Duration of surgery	wound dehiscence			P-value
	Present	Absent	Total	
< 150 minutes	0	40	40	0.0001
>= 150 minutes	6	14	20	
Total	6	54	60	

All of the patients with dehiscence had undergone more than 150 minutes of surgery

Table 2. Comparison of wound dehiscence by time interval from onset of symptoms to surgery				
Time interval between 1st symptom and incision present	wound dehiscence absent		Total	P-value
<6 hrs	0	1	1	
>= 6 hrs - 12 hrs	0	4	4	0.661
>= 12 hrs- 24 hrs	3	15	18	
>= 24 hrs	3	34	37	
Total	6	54	60	

All of those who had wound dehiscence had surgery beyond 12 hrs from their first symptoms.

The frequency of wound dehiscence was highest in those with upper midline incision (1 out of 5, i.e. 20 %) however the results were statistically not significant.

Those patients who had coughing the early post-operative period had statistically risk for wound dehiscence as compared to those who did not have these risk factors.

Those patients who had wound infection in the early post-operative period had statistically significant risk for wound dehiscence as compared to those who did not have these risk factors.

The risk for wound dehiscence had no correlation to the site of pathology in the abdomen.

Table 4. Distribution of wound dehiscence according to patient's factors				
Patient's factors Present	wound dehiscence Absent		Total	P-value
COPD	0	13	13	
Anaemia	1	3	4	
Hypertension	1	0	1	0.005
Smoking	3	11	14	
Total	6	54	60	

Those patients who had the risk factors like COPD, anemia, HTN or smoking had increased chances for wound dehiscence as compared to those without, P value = 0.005.

DISCUSSION

Wound dehiscence is the end result of impaired wound healing that follows a complex interplay between multiple factors that are related to the patient, underlying disease, events in the early post-operative period and the technical factors.

The wound dehiscence in our series was 10 % which is higher as compared to most other studies where it is reported as ranged from1% to 2.6%.1-5,39 Studies from Pakistan by waqar et al23 and Hanif et al 36 from Pakistan report incidence as high as 6%. The higher rate in our study might be because we have only studied the rates in patients undergoing emergency laparotomy. The dehiscence rates associated with emergency laparotomy are higher than those with elective cases. 7,9 Waqar et al23 reported a dehiscence rate of 12 % when only emergency cases were considered.

In this study, wound infection was found in all 6 cases with dehiscence. Col and Soran also reported wound infection as an important risk factor for wound dehiscence.[38]

One of our 6 patients with wound dehiscence (12%) died. Mortality rate associated with wound dehiscence mentioned in literature is 15-24 %.Fischer reported it to be 36 %, while in a local study by Hanif it was 50 %. However, Makela 24 and Hanif 36 found that the risk of wound dehiscence increases with advancing age.

In the present study, it was observed that the rates of wound dehiscence increased significantly with the duration of surgery (P = 0.0001). All of the patients with dehiscence had undergone more than 150 minutes of surgery. None of those patients who had surgery within 12 hrs from onset of their symptoms had wound dehiscence, however the results were statistically insignificant.

In our study, the risk for wound dehiscence had no correlation to the site of pathology in the abdomen. No correlation was observed between rates of wound dehiscence and length of the midline incision.

In our study, those patients who had cough or wound infection in the early post-operative period had statistically significant risk for wound dehiscence as compared to those who did not have these risk factors (P= 0.0001). In the study by Waqar et al 23 too, wound infection was found in all 7 cases with dehiscence. Col and Soran also reported wound infection as an important risk factor for wound dehiscence.38

The patients who had the risk factors like COPD, anemia or smoking had increased chances for wound

dehiscence as compared to those without, P value = 0.005.

The rate of wound dehiscence in the study is 5.9 % (7/117), which is comparable to that reported by Hanif36 In this study male to female ratio is 3:1. Male predominance has been mentioned in many studies. Hampton and Hanif showed the ratio to be 2:1. Risk of wound dehiscence increases with advancing age. Four of our patients with wound dehiscence (57%) were above the age of 50. Hanif also showed advanced age in 50 % of cases. Makela also observed advanced age as a risk factor.

LIMITATION

The sample size is small and the number of cases with burst abdomen is small. Surgical teams involved have been of differing skills and this has not been matched for in the analysis. Due to financial constraints, it has not been possible to objectively quantify the degree of malnutrition in our patients.

CONCLUSION

Overall rate of wound dehiscence in our study was 10%. The rates of wound dehiscence increased significantly as the operative time increased.Rates of wound dehiscence had no relation to age and sex of the patient or location of the pathology.

Those patients who had cough or wound infection in the early post-operative period had statistically significant risk for wound. Those patients who had the risk factors like COPD, anemia or smoking had increased chances for wound dehiscence.

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