



CLINICAL STUDY OF ABDOMINAL WOUND DEHISCENCE AND IT'S MANAGEMENT.

General Surgery

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ABSTRACT

BACKGROUND AND OBJECTIVES: Wound dehiscence/burst abdomen is a very serious postoperative complication associated with high morbidity and mortality. It has significant impact on health care cost, both for the patients and hospitals. The need for this study is to highlight the risk factors for wound dehiscence, the incidence rate in this hospital and remedial measures to prevent or reduce the incidence of wound dehiscence and to predict the outcome of the management of abdominal wound dehiscence. This will certainly reduce mortality and morbidity in the form of prolonged hospital stay, increased economic burden on health care resources and long term complication of incisional hernia.

METHODS Total 100 cases clinically presenting as gaping of abdominal wound and discharge from the site were taken for study. Each case 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 The incidence of abdominal wound dehiscence is more common in male patients and in 4th to 5th decade. Patients with peritonitis due to duodenal perforation, intestinal obstruction and malignancy carried higher risk of abdominal wound dehiscence. Patients with surgical wounds classified as dirty wound had higher incidence of abdominal wound dehiscence. Post operative abdominal wound dehiscence is more common in patients operated in emergency and in those operated with midline incision. Patients with anaemia (Hb% <10g%), jaundice and BMI more than 25 had higher incidence of wound dehiscence.

CONCLUSION Abdominal wound dehiscence causes significant morbidity and mortality. Intraperitoneal infection is the most important factor in predicting burst. Malnutrition, anemia, abdominal distension correctly predict a burst in every case. Simple investigations like Hb%, RBS, RFT, LFT, chest x-ray, may help to detect predisposing factors. Surgeon factor like midline incision, improper suture technique, improper aseptic precaution play a role. Wound dehiscence can be prevented by improving nutritional status of patient, proper surgical technique, and correcting co morbid condition.

KEYWORDS

wound dehiscence, peritonitis, malignancy, midline incision

INTRODUCTION

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. It is among the most dreaded complications faced by surgeons and of greatest concern because of risk of evisceration, the need for immediate intervention, and the possibility of repeat dehiscence, surgical wound infection, and incisional hernia formation. Abdominal wound dehiscence (burst abdomen, fascial dehiscence) is a severe postoperative complication, with mortality rates reported as high as 45%. Incidence as described in literature ranges from 0.4% to 3.5%. Various risk factors are responsible for wound dehiscence such as emergency surgery, intraabdominal infection, malnutrition (hypoalbuminaemia, anaemia), advanced age >65yrs, systemic diseases (uremia, diabetes mellitus) etc. Good knowledge of these risk factors is mandatory for prophylaxis. Mortality and morbidity in the form of prolonged hospital stay, increased economic burden on health care 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.

OBJECTIVES

- To assess the association and prevalence of risk factors involved in causing abdominal wound dehiscence.
- To identify the type of disease involved in causing abdominal wound dehiscence.
- To study incidence of wound dehiscence in elective and

emergency operation and also incidence based on type of incision taken during operation.

- To effectively manage cases of wound dehiscence.

METHODOLOGY

Total 100 cases clinically presenting as gaping of abdominal wound and discharge from the site during the period of November 2016 to October 2018 were taken for study. 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. Following which management of these cases in ASRAM HOSPITAL based on facility available here was done.

Inclusion criteria

- Patient more than 18 years of age and either sex.
- Patients presenting with abdominal wound dehiscence after undergoing elective or emergency operation.
- Patients who are ready for investigations and treatment for their condition.

EXCLUSION CRITERIA

- Patients less than 18 years of age.
- All female patients who developed wound dehiscence after any gynaecological procedures.
- All patients with incisional hernia.
- All patients who refuse investigation and treatment.

TYPE OF OPERATION:

Certain types of operations have a tendency to be followed by dehiscence. These include laparotomy for generalized or localized peritonitis, in patients with perforated peptic ulcer, appendicitis,

diverticulitis, acute pancreatitis, intra abdominal malignant diseases, chronic inflammatory bowel disease and reoperation through original incision within the 1st 6month after initial procedure. The cause of the wound failure is not in the operation itself but in the presence of many of the factors previously mentioned.

TYPE OF SURGICAL WOUNDS:

Surgical wounds are classified based on the presumed magnitude of bacterial load at the time of surgery. Clean wounds (Class I) include those in which no infection is present, only skin microflora potentially contaminate the wound, and no hollow viscus that contains microbes is entered. Clean / contaminated (class II) include those in which a hollow viscus such as the respiratory, alimentary or genitourinary tracts with indigenous bacterial flora is opened under controlled circumstances without significant spillage of contents. Elective colorectal cases have classically been included as class II cases, contaminated wounds (class III) include open accidental wounds encountered early after injury, those with extensive introduction of bacteria into a normally sterile area of the body due to major breaks in the sterile technique, gross spillage of viscus contents such as from the intestine. Dirty wounds (class IV) include traumatic wounds in which a significant delay in treatment has occurred and in which necrotic tissue is present, those created in the presence of overt infection as evidenced by the presence of purulent material, and those created to access a perforated viscus accompanied by a high degree of contamination.

MISCELLANEOUS FACTORS:

An etiologic factor cannot be identified in every patient without a wound dehiscence. The role of ascorbic acid, zinc and manganese in extra cellular fluid has not been established definitively, although they are thought to influence the maintenance of connective tissue integrity. Anticoagulants such as warfarin and heparin increase postoperative wound haematoma, modestly increasing the risk of incisional hernia.

PREVENTIVE MEASURES FOR ABDOMINAL WOUND DEHISCENCE

Many of the factors identified as being important for the rate of wound complications are not possible to correct preoperatively or cannot be influenced by the surgeon. Patient age or over weight cannot of course be influenced, when an emergency laparotomy of a grossly contaminated abdomen is required. The suture technique is, however completely in the hands of the surgeon and relates strongly to the rate of wound complications.

INCISIONS:

The choice of laparotomy incision is influenced by consideration of the complexity of the incision and the time it takes to open and close the abdomen. The access gained must also be considered. The rate of wound complications is different for midline, paramedian, lateral paramedian, oblique, transverse and muscle-splitting incisions. When restricted access to the abdomen is sufficient, muscle-splitting incisions are preferred as they are associated with a much lower rate of wound complications because they produce a shutter mechanism that tends to close the wound.

SUTURE MATERIALS:

Monofilament suture materials are associated with a lower rate of wound infection than are the multifilaments because the bacteria being enclosed within the interstices of multifilament sutures are protected from phagocytosis. Non absorbable suture materials allow support of the wound during the entire healing period and have been used with good results. With slowly absorbable monofilament suture materials that retain an acceptable strength for at least 6 weeks.

THE METHOD OF WOUND CLOSURE:

It is recommended that laparotomy incisions be closed by a continuous suture technique in one layer. With this, less foreign material and fewer knots are deposited and allow tension to adjust evenly along the suture line. Self-locking knots should be used for the anchor knot. In vertical midline incisions, stitches should mainly include aponeurotic tissue and be placed at least 10mm from the wound edge. The length of each stitch should be less than 5cm; otherwise it will be associated with an unnecessary high rate of wound infection. Incorporating peritoneum, muscle or subcutaneous fat in the suture is not necessary and may have deleterious effects. The surgeon should take care that excessive tension is not placed on the suture.

WOUND INFECTION:

It is an important causative factor. In wounds that are subject to intraoperative contamination, the incidence and subsequent infection can be reduced by administration of appropriate antibiotic prophylaxis. Adherence to principles of exquisite and gentle tissue dissection, use of minimal amounts of suture material or of electrocautery, avoidance of stoma through the wound, irrigation of the wound during closure to remove debris, blood clots and foreign matter, meticulous haemostasis reduces the incidence of wound dehiscence.

MANAGEMENT

Once dehiscence is diagnosed, treatment depends on the extent of fascial separation and the presence of evisceration or significant intraabdominal contamination. A small dehiscence in proximal aspect of upper midline incision can be managed conservatively by packing the wound with saline-moistened gauze and using an abdominal binder. In the event of evisceration, the eviscerated intestines must be covered by sterile, saline-moistened towel and preparations made to return to operation theater after fluid resuscitation. Once in operating room, through exploration of the abdominal cavity is performed to rule out presence of septic focus or an anastomotic leak that may have predisposed to the dehiscence. Treatment of infection is of critical importance before attempting closure. Management of incision is a function of the condition of fascia. When technical mistakes are made and the fascia is strong and intact, primary closure is warranted. If the fascia is infected or necrotic, debridement is performed. If after debridement the edges of the fascia cannot be approximated without undue tension, consideration needs to be given to closing with absorbable mesh or the recently developed biologic prosthesis (decellularized porcine submucosa and dermis and human cadaveric dermis).

Attempts to close the fascia under tension guarantee a repeat dehiscence and possible intra-abdominal hypertension. Definitive surgical repair to restore the integrity of abdominal wall will eventually be required if absorbable mesh is used but not if a biologic prosthesis is used. Absorbable mesh and biologic prosthesis protect from evisceration, maintain the abdominal domain, and provide a barrier to prevent bowel desiccation, bacterial invasion and nonadherent, potentially permanent closure. Autologous skin grafts are used to reconstruct the epithelial barrier, and flaps are used to reconstruct the abdominal wall.

For short term management of a dehisced wound, a wound vacuum system can be used that consists of open cell foam placed on tissue, semi occlusive drape to cover the foam and skin of patient, and suction apparatus. The wound vacuum system provides immediate coverage of the abdominal wound acts as a dressing that minimizes heat loss and does not require suturing to fascia. By using negative pressure, the device removes interstitial fluid and thus lessens bowel edema, decreases wound size, reduces bacterial colonization, increases blood perfusion, and induces the healing response. Successful closure of the fascia can be achieved in 85% of cases of abdominal wound dehiscence. The technique, however, may be associated with evisceration, intestinal fistulization, and hernia formation.

RESULTS

In this study total 100 cases, majority of patients belonged to the age group between 51-60 years, youngest patient was 22 year old and oldest patient was 84 years. The mean age of patients affected was 47.62 yrs (S.D=14.5) 69 cases were male and 31 female cases. Perforation closure was performed for 49 cases, resection anastomosis for 25 cases, appendectomy for 9 cases and other procedure like splenectomy, mesenteric tear repair, Adhesiolysis, Strictureplasty etc. 53 patients had peritonitis secondary to hollow viscus perforation, 23 diagnosed has intestinal obstruction, 9 cases were malignancy. Comorbid conditions Diabetes 32%, hypertension 38%, pulmonary disease 24%, malnutrition 36%, anemia 48%, CRF 4%, malignancy 8%, intra abdominal infection 60%, 42 pts had B.M.I >25 and 58 patients had B.M.I <25. 52 patients had HB% more than 10g% and 48 patients had HB% less than 10%. 22 patient had deranged serum electrolytes, 22 patients had hypokalemia and 22 patient had hyponatremia (HN). Hypokalemia (HK) is important cause of post op paralytic ileus and abdominal distension. 38 patients had elevated renal parameters. 84% Emergency cases and 16% elective cases, midline incision 61% and paramedian incision 39%. Partial wound dehiscence 40% cases were conservatively managed. Secondary suturing was done for 28% cases. Tension suturing was done for 32% cases.

DISCUSSION

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, 7 showed the incidence of abdominal wound dehiscence more commonly male gender 60% and mean age of 69.5 years. In a study conducted between Jan 1985 to Dec 2005 at Department of Surgery, Erasmus University Medical Center, male were 75% and female patients 25%.⁶ In our study males predominated the picture with the ratio of 2.2:1. This male predominance may be due to the higher incidence of peptic ulcer perforation and intestinal obstruction in male sex.

In a study was carried out at department of General Surgery, Pakistan Institute of Medical Sciences, Islamabad from 1st January 2002 to 31st December 2002, mean age of presentation was 39.67 yrs. In our study mean age of presentation was 47.62 yrs. Incidence of perforation and intestinal obstruction was common in this age group.

Comparison of incidence in elective vs. emergency surgery

In a Study conducted at Pakistan Institute of medical science showed that 72% of the patients who developed abdominal wound dehiscence had undergone surgery in emergency.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 showed that 60% of the patients operated who developed wound dehiscence were operated in emergency.⁸ In our study 84% of patients who underwent emergency surgery developed abdominal wound dehiscence ($p < 0.001$).

Day of presentation of abdominal wound dehiscence

In a study conducted at Department of Surgery, Erasmus University Medical Center, post operative day 9 was the mean day of developing wound dehiscence.⁶ In a study at department of surgery of Mesologgi General Hospital and Urban Community Teaching Hospital 9th post op day was mean for wound dehiscence with a range from 6th to 15th day.⁷ In our study mean post op day was also 9th day. In a study conducted at Surgical unit IV DHQ hospital, Faisalabad. From January 2002 to June 2003 the main risk factors associated with wound dehiscence were uraemia, obesity, hypoproteinemia, diabetes mellitus, obesity, chronic liver disease etc. 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 anaemia, uraemia, sepsis, ascites, steroid use, hypertension were other risk factors acting as determinants for wound dehiscence.⁷ In our study 48% of patients had anaemia, 38% hypertension, 36% malnutrition, 32% DM and sepsis being a major determinant with 60% of the cases. In a 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.⁵⁷ Our study showed that abdominal wound dehiscence is more commonly in patients operated for peritonitis due to hollow viscus perforation 53% of the patients studied were operated for hollow viscus perforation among which 40 patients had Duodenal ulcer perforation, and 13% of patients had either gastric perforation, ileal perforation, jejunal perforation. 23% of the patients had small bowel obstruction and 9% of the patients had underlying malignancy. For the patients with bowel perforation which were classified mostly into contaminated surgical wounds, the procedure performed was peritoneal lavage with perforation closure. Most patients diagnosed with small bowel obstruction underwent resection and anastomosis and few underwent adhesiolysis and colostomy.

In a Study conducted in Department of Surgical Gastroenterology, University of Copenhagen, Hvidovre Hospital in 2001⁵⁸ 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 ($p = 0.0001$). In our study out of 100 patients 61% patients underwent surgery with midline incisions and 30 patients with right paramedian incisions, i.e. 96% of patients with vertical incisions had wound dehiscence. A study at Department of Surgery Sundsvall County Hospital, Sweden concluded overweight (BMI > 25) 59 Our study 42% patients were over weight, (BMI > 25), 31 patients were

having their BMI above 22 and 27 patients were having their BMI 22 and below.

CONCLUSION

Abdominal wound dehiscence causes significant morbidity and mortality. Intraoperative infection is the most important factor in predicting wound dehiscence. Patient factors like older age group, male sex, anaemia, malnutrition, obesity, patients with peritonitis due to bowel perforation, intestinal obstruction act as determinant for wound dehiscence. Emergency procedure is prone for burst abdomen. Simple investigations like Hb%, RBS, RFT, LFT, chest x-ray, may help to detect predisposing factors. Surgeon factors like midline incisions, improper suture technique and improper aseptic precautions which may lead to wound infection and then wound dehiscence. Hospital stay and health expenditure is usually protracted. Patients with these risk factors require more attention and special care to minimize the risk of occurrence. Postoperative abdominal wound dehiscence can be prevented by improving the nutritional status of the patient, strict aseptic precautions, avoiding midline incisions, improving patients respiratory pathology to avoid postoperative cough and by proper surgical technique.

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