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Clinical profile of patients with abdominal wound dehiscence

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Abstract

Once dehiscence is diagnosed, treatment depends on the extent of fascial separation and the presence of evisceration or significant intra-abdominal contamination. A small dehiscence in proximal in aspect of upper midline incision can be managed conservatively by packing the wound with saline-moistened gauze and using an abdominal binder. A total of 60 cases were included in the study. A comprehensive study of these cases with keeping in record the date of admission, presenting complaints and general condition, risk factors, bold investigations, clinical diagnosis, the need for surgery and the types of surgery, followed by wound care, course in ward and day of dehiscence. Co-morbid conditions like anaemia, hypertension, diabetes mellitus, etc. were treated where possible. In the present study, out of 60 cases, 52 cases (87%) were operated as emergency surgery and 8 cases (13%) as elective surgery. In this study, from a total of 60 cases, 44 cases (73%) were operated with mid line incision and d10 cases (17%) were operated with paramedian incision.

Keywords: abdominal wound dehiscence, paramedian incision, co-morbid conditions

Introduction

The most common causative factor in the development of wound dehiscence is wound infection that leads to impaired wound healing, wound infection interferes with normal healing, resulting in a wound that contains less collagen and in which the collagen is not highly cross linked as in a normally healed wound. This weakness sets the stage for later postoperative abdominal wound dehiscence [1].

The tension of the suture line is lower in transverse or oblique incision than in the midline incisions as thought to be associated with lower rate of wound dehiscence has not been convincingly substantiated in clinical studies. A suggested higher rate of wound dehiscence in incisions in the upper abdomen versus the lower abdomen also has not been verified. In clinical studies wound dehiscence has indeed been reported to be very low in muscle splitting incision but they provide a limited access to the abdominal cavity [2].

With absorbable suture materials that lose 80% of their strength within 14 days, wound dehiscence has been shown to be more common. Multifilament suture materials are associated with more wound infection because bacteria are being enclosed within the interstices of multifilament sutures, where they are protected from phagocytosis.

If a single stitch in an interrupted closure is very tight, ischemia will develop in the tissue enclosed. In this technique more knots, more foreign materials will be deposited resulting in wound infection and sinus formation. The rate of incisional hernia is more if the SI: WL ratio is less than 4. If the stitch length is more than 5cm rate of wound infection is high. Incorporating peritoneum, muscle or subcutaneous tissue may have deleterious effects. Excessive tension placed on the suture reduces local blood flow and is associated with increased wound infection.

There is no question that wound dehiscence becomes more frequent as the age of the patient increases. Wound healing in older patients is retarded is not so appreciable as to account fully for the subsequent development of wound dehiscence, but could be that the extent of dissection and the potential for intra operative contamination are greater in operations conducted in older patients (i.e., extensive resection for cancer) [3].

Excessive fat in the omentum and the subcutaneous tissue results in increase strain on the wound with all body movements in the early postoperative period. Associated poor muscle tone and lack of muscle mass also are causative factors in the development of wound dehiscence.

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Surgery in obese patient is associated with an increased potential for postoperative pulmonary complications, wound infection and pulmonary embolus.

Malnourished patients, particularly those who have lost a significant amount of weight over a relatively short period before operation, and whose levels of serum albumin and other proteins contemplate a state of malnutrition, are at higher risk for poor wound healing.

Carbohydrates, together with fats, are the primary sources of energy in the body and consequently in the wound healing process. The energy requirements for wound healing consist mainly of the energy required to carry out collagen synthesis in the wound [4].

The effects of postoperative coughing and straining are much overdone as etiologic factors for subsequent wound dehiscence. Bucking during the termination of general anesthesia or vigorous coughing while sedated literally tears the suture in the wound.

The use of steroids is detrimental to wound healing. Wounds heal poorly in patients receiving long term steroid therapy because the normal inflammatory responses that are necessary to initiate wound healing are blunted with consequent impaired deposition and polymerization of collagen in the wound.

The early postoperative administration of chemotherapy is associated with impaired wound healing. It is preferable to delay such treatment for several weeks to permit maximal wound healing.

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 [5].

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 anastigmatic 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) [6].

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. Antillogous 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.

Methodology

This prospective study included inpatients and out patients admitted in all surgical units of hospital, attached to Medical College and Research Institute.

A total of 60 cases were included in the study. A comprehensive study of these cases with keeping in record the date of admission, presenting complaints and general condition, risk factors, bold investigations, clinical diagnosis, the need for surgery and the types of surgery, followed by wound care, course in ward and day of dehiscence. Co-morbid conditions like anaemia, hypertension, diabetes mellitus, etc. were treated where possible. Initial dose of prophylactic intravenous antibiotics were given to all patients presenting with acute abdomen before surgery in emergency as well as elective cases, and course was continued with respect to requirements of every surgery.

As per protocol in the institutes, all midlines were closed with Prolene, non-absorbable monofilament, synthetic suture (polypropylene No.1).

All patients proforma containing details of the date of admission, age, gender clinical diagnosis, whether emergency or elective surgery, type of surgery, clinical classification of wounds, types of incision and types of procedure performed, day of abdominal wound dehiscence and its management was recorded accordingly. All wounds were examined from third post-operative day, mainly to look for signs of inflammation like erythema, tenderness, purulent or serosanguinous discharge. Examination to be continued till the removal of sutures and scar formation. Wounds which showed complete signs of healing with removal of sutures by 10th post-operative day were labelled as normal healing. Any complication or delay was deemed delayed wound healing.

Results

Table 1: Incidence in Different Age Groups

Age	No. of cases	Percentage
21-30	8	13.33%
31-40	12	20%
41-50	20	33.33%
51-60	11	18.33%
61-70	6	10%
>	3	5%
	60	100

In the presenting study major number of patients belonged to the age group between 41-50 years, youngest age was 22 years and oldest patient was 82 years. The mean age of patients affected was 46.25 (SD 13.95)

Table 2: Incidence OF Abdominal Wound Dehiscence in Different Genders.

Gender	No. of cases	Percentage
Male	46	76.67%
Female	14	23.33%

Out of 60 cases, 46 cases were male and 14 female cases.

Table-3: Effect of Emergency Surgery in Development of Abdominal Wound Dehiscence.

Surgery	No. of cases	Percentage
Elective	8	13.33%
Emergency	52	86.67%
	60	100

In the present study, out of 60 cases, 52 cases (87%) were operated as emergency surgery and 8 cases (13% as elective surgery).

Table 4: Different Types of Surgical Wound Presenting with Abdominal Wound Dehiscence.

Type of Surgery wound	No. of cases	Percentage
Clean	0	0
Clean contaminated	6	10%
Contaminated	38	63.33%
Dirty	16	26.67%
	60	100

38 cases i.e. 63% in the presenting study have undergone procedures which are classified as contaminated and no case has undergone clean surgery.

Table 5: Frequency in Relation to Type of Incision

Type on incision	No. of cases	Total
Upper midline (UM)	12	44
Midline (MM)	22	
Lower midline (LM)	10	
Right upper paramedian (RUP)	6	10
Right lower paramedian (RLP)	4	
McBurney's (MCB)	6	6
Total	60	60

In this study, from a total of 60 cases, 44 cases (73%) were operated with mid line incision and 16 cases (17%) were operated with paramedian incision.

Table-6: Distribution of Patients with Abdominal Wound Dehiscence According to Underlying Intraabdominal Pathology.

Diagnosis	No. of cases
Hollow viscus perforation.	28
Duodenal ulcer	13
Others (GP, If, IF, MDP)	15
Appendicular pathologies	9
Intestinal obstruction	12
Malignancy	3
Others	8
Total	60

In this study, amongst 60 cases studied, 28 patients were diagnosed to have peritonitis due to hollow viscus perforation, 9 patients had appendicular pathology, 15 patients with intestinal obstruction and 3 patients presented with malignancy.

Discussion

In the present study, the average age of patients with delayed wound healing was found to be 46.25 yrs. Incidence of hollow viscus perforation and bowel obstruction was common in this age group.

A prospective audit done by S. Guo and L.A DiPietro at the Center for Wound Healing and Tissue Regeneration, University of Illinois at Chicago showed a higher result, of the average age being 68.6 yrs.

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 a study conducted between 2007, 3500 abdominal laparotomies where performed in department of surgery of Mesologgi General Hospital and Urban Community Teaching Hospital, were mean age was 69.5 Yrs.

In the present study, the average age of patients with delayed wound healing was found to be 46.25 yrs. Incidence of hollow viscus perforation and bowel obstruction was common in this age group.

In a study conducted between 2007, 3500 patients underwent abdominal surgeries in department of surgery of Mesologgi General Hospital and Urban Community Teaching Hospital of 150 beds, reported incidence of abdominal wound dehiscence was more common in male gender 60%.

In a study conducted between Jan 1985 to Dec 2005 at Department of Surgery, Erasmus University Medical Center, male were 75% and female pts 25% [7].

In our study there was a higher male population with a ratio of 3.3:1. This increased number of males can be attributed to the higher incidence of peptic ulcer perforation and intestinal obstruction in male gender.

In a study conducted in Department of Surgery, Case Western Reserve University, Cleveland veterans Affairs Medical Center USA, 107 cases were reported to have abdominal wound dehiscence over a period of 7 years. It was noted that these patients having intraabdominal pathologies were more likely to have undergone and emergency operations ($p < 0.02$), colon surgeries' ($p < 0.005$), or an operation with greater wound classification ($p < 0.02$) and wound dehiscence is more common emergency operation and surgeries with higher wound classification [8].

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. In a study conducted between 2007, 3500 abdominal laparotomies where performed in department of surgery of Mesologgi General Hospital and Urban community Teaching Hospital showed that 60% of the patients who developed wound dehiscence were operated in emergency.

In our study, among 60 patients developing laparotomy wound dehiscence, 87% of patients were operated on emergency basis.

Our study showed that abdominal wound dehiscence is more commonly in patients operated for peritonitis due to hollow viscus perforation (47%). Amongst which duodenal perforation accounted for 22%. Other perforations which included gastric perforation, ileal perforation, jejunal perforation accounted for 25%. 20% of the patients had small bowel obstruction and 5% 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 of the patients presenting with enteric obstruction underwent resection and anastomosis while remaining few were subjected to adhesiolysis and colostomy.

Conclusion

Patient factors such as older age group, male sex, co morbidities like anaemia, malnutrition, COPD, Obesity, DM, smoking, patients with peritonitis due to hollow viscus perforation, intestinal obstruction. With Class 3, 4 contaminated dirty wounds.

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