

# DEHISCENCE OF LAPARATOMY WOUNDS IN CHILDREN

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## ABSTRACT

**Objective:** To assess the various causes or factors leading to dehiscence of incised surgical wounds of the abdomen in children.

**Material and Methods:** The record and charts of all patients who developed dehiscence of the abdominal wounds after operation for various diseases were reviewed and data was collected. The age, sex, timing of surgery, reason for surgery, place of primary surgery, operating experience of surgeon, type of suture material, surgical technique, associated medical conditions, nutritional status and the use of per operative antibiotics were the variables which were analyzed. Different causes of wound dehiscence were assessed and analyzed.

**Results:** During the period of 12 months 22 patients developed wound dehiscence. Age ranged from 3 days to 10 years. There were 13 male and 9 female patients. The reason for primary surgery was: intussusceptions in 2 patients; worm obstruction: 2; colostomy for recto vaginal fistula: 3; colostomy closure: 3; posterior sagittal anorectoplasty combined with abdominal approach: 1; abdominal injuries (blunt & penetrating): 5; enteric perforation: 3; mass abdomen: 2; band obstruction and subsequent anastomotic leak: 1. Two patients died during the treatment. 17 patients developed complete burst which was repaired while 5 patients were treated conservatively and developed incisional hernia.

**Conclusion:** Wound dehiscence was commonly seen in patients with abdominal wound infection, peritonitis and malnutrition. Control of infection, correction of anemia and malnutrition along with strict adherence to surgical principles plays a vital role in preventing the dreaded complication of abdominal wound dehiscence.

**Key words:** Abdominal wound dehiscence, abdominal wound infection, burst abdomen, anemia, malnutrition.

## INTRODUCTION

Surgical wound site infection is defined when there is pain at wound site accompanied by induration, tenderness, purulent discharge with or without associated systemic symptoms<sup>1</sup>. The complications of the surgical wound infection include delayed healing, high morbidity and mortality, prolonged hospital stay<sup>2,3,4,5</sup> and dehiscence of the wound<sup>6,7</sup>. If there is no complete burst but incisional hernia because of wound infection it increase anxiety of the parents and adding another surgical procedure. In children four clinical studies have addressed the problem of wound dehiscence and evisceration. The incidence

of evisceration and its associated mortality is decreasing with time, because of the good pre and post operative care, use of prophylactic antibiotics, care of nutrition of the children and frequent use of transverse rather than the mid line incision.<sup>8</sup>

We conducted this retrospective study to identify various factors responsible for wound dehiscence in our set up.

## MATERIAL AND METHODS

The record of all the patients who developed post surgical abdominal wound infection were reviewed during the period of 12 months from January 2008 – December 2008. Out of these

## ASSOCIATION OF INITIAL PATHOLOGY WITH ABDOMINAL WOUND COMPLICATIONS

Initial pathology	No. of pts	Initial surgery	Complication
Intussusception	01	Resection anastomosis	Burst.
Intussusception with perforation	01	Resection anastomosis	Burst
Worm obstruction	01	Enterotomy & removal of worms	Burst
Worm obstruction & gut gangrene	01	Resection anastomosis	Anastomotic leak+ burst + death
Anorectal malformation	01	Colostomy	Burst
Anorectal malformation & recto vaginal fistula	02	Colostomy	Burst
Anorectal mal formation.	01	Abdominoperineal pull through	Burst
Anorectal malformation	03	Colostomy closure	Burst
Band obstruction & gut gangrene	01	Resection anastomosis	Burst
Penetrating abdominal injuries	02	Resection anastomosis of small gut	Burst
Enteric perforation	02	Closure of perforation	Anastomotic leak+ burst + death in one
Penetrating abdominal injuries	01	Stomach injury repaired	Incomplete dehiscence
Blunt abdominal trauma	02	Splenectomy 01 Jejunal anastomosis 01	Incomplete dehiscence
Enteric perforation	01	Closure of perforation	Incomplete dehiscence
Abdominal lymphoma	01	Biopsy from lymph nodes	Incomplete dehiscence
Supra renal neuro blastoma	01	Resection	Incomplete dehiscence

Table 1

only those patients were included in the study where total disruption of the wound had occurred causing burst abdomen and evisceration or incisional hernia. Simple wound infection was excluded.

The detailed data of all these patients including age, sex, weight, haemoglobin, nutritional status (assessed by serum albumin, weight, height and triceps fold thickness), co morbid conditions especially chest infections, initial pathology, delay between onset of symptoms and initial treatment, details of the surgical procedure, operative experience of the surgeon, and the use of per operative antibiotics were noted. Details of the surgical procedure included the type of incision, procedure performed, type of suture material used, contamination before or during surgery, postoperative course, complications and management were all recorded.

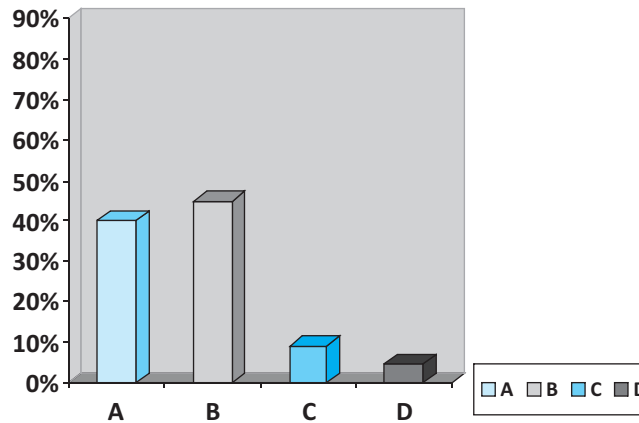
### RESULTS

During a period of 12 months, 22 patients developed wound dehiscence. Patient's age ranged from 3 days to 10 years. There were 13 males and 9 females. Of these 22 patients, thirteen were operated in emergency situation under less

favourable circumstances, occasionally with a compromise on suture material and length, and sometimes by less experienced surgeons. Sixteen patients developed complete dehiscence (burst abdomen) and evisceration. They were repaired immediately with mass closure. Six patients out of the 22 developed incomplete dehiscence and were treated conservatively. They later manifested as incisional hernia. Two patients from the complete burst abdomen group that were repaired subsequently also developed incisional hernia later.

The association of initial pathology and initial surgery with abdominal wound dehiscence is shown in table 1.

Nine patients had abdominal wound infection prior to developing a dehiscence. All of these patients had peritonitis secondary to a perforation in the gut or an anastomotic leak before they developed wound infection. Malnourishment and anemia was observed in 6 patients out of the 13 operated in emergency and in 4 patients operated on elective lists such as those having recto vaginal fistula or malignancy (mass abdomen). The different causative factors thought to be responsible for abdominal wound dehiscence in our study are shown in fig.1.

**Fig. 1: Possible causative factors in wound dehiscence**

Key: Abdominal wound infection:A; malnutrition:B; malignancy:C; prolonged surgery:D.

Two patients with burst abdomen died. The initial pathology was worm obstruction in one patient who was severely anemic and small gut gangrene had occurred. Resection anastomosis was done which leaked and the patient developed frank peritonitis, septicemia and died. Anemia was thought to be the main reason behind the initial anastomotic leak. The other patient presented late after an enteric perforation and had already developed frank peritonitis and septicemia.

## DISCUSSION

Post operative disruption of the abdominal wall wound, either by evisceration or dehiscence is a rare occurrence now because of the good pre operative evaluation, advances in operative and post operative care, use of broad spectrum antibiotics and the availability of good tensile strength suture material<sup>9, 10</sup>.

Complications of surgical wound infection include delayed wound healing, prolonged hospital stay, incomplete or complete dehiscence and associated high mortality<sup>9</sup>. We have similarly observed abdominal wound infection to be a prominent cause of dehiscence in our patients. Nine patients in our study had abdominal wound infection as predisposing cause to dehiscence. The cause of infection most probably lies in the fact that most of our patients had contaminated abdomen secondary to peritonitis because of gut perforation or anastomotic leak. The literature reports high mortality in children once complete disruption and evisceration occurs<sup>8</sup>. In our study out of the 16 children who developed complete burst abdomen, 2 died showing the mortality rate to be 12.5%.

Per operative broad spectrum antibiotics in clean contaminated and contaminated abdominal

surgery plays important role in decreasing the rate of surgical wound infection and its complication<sup>11</sup>. Surgical wound infection and its sequelae like burst abdomen is associated with prolonged hospital stay and high cost to the patients as well as to the health sector. The same is the observation in our study and an average of one week extra stay was noted causing more financial burden to the patients and increasing bed occupancy. Good surgical technique, appropriate suture material and length for the closure of incision are equally important. Israel son in his study in 1996 shows 22% incisional hernia rate when suture length: wound length ratio is less than 4:1 as compared to 9% when suture length: wound length ratio is > 4:1<sup>7</sup>. In our study we made a similar observation that the complication rate was high whenever there was a compromise on suture material especially during emergency surgery. Operative experience was also noted to be a contributing factor.

The general condition of the patient, malnutrition and presence of co morbid disease accounts for high incidence of disruption and delayed healing<sup>12</sup>. We have made a similar observation in our study. Two of our patients with intra abdominal malignant disease were anemic and malnourished preoperatively and later developed wound complications.. Our patients with worm obstructions and recto vaginal fistula were similarly found to be malnourished. Moreover patients with recto vaginal fistula had also associated co morbid conditions like congenital heart and renal problems.

## CONCLUSION

Wound dehiscence was observed in patients with abdominal wound infection, peritonitis and malnutrition. Control of infection, correction of anemia and malnutrition along with

strict adherence to surgical principles plays a vital role in preventing this fearful complication.

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