



## EPIDEMIOLOGY AND PREDICTORS OF WOUND DEHISCENCE IN ABDOMINAL SURGERIES"

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**ABSTRACT** Wounds and their management are fundamental to the practice of surgery, as any surgical intervention will result in a wound. Postoperative wound complications represent one of the most frustrating and difficult occurrences experienced by surgeons. Wound dehiscence (burst abdomen) is a very serious postoperative complication which is associated with very high morbidity and mortality rates. It affects the patients by increasing distress and risk of mortality, the attendants by increasing the cost of treatment and wastage of their precious time in hospital, the surgeon for whom it is a disturbing reality and the hospital resources by increasing the healthcare cost due to prolonged stay.

**Aims and objectives:-**

1. To find out epidemiology of wound dehiscence.
2. To evaluate various predictors leading to wound dehiscence.

**Material and methods:-**

The study was conducted in the Department of Surgery, Government Medical College, Jammu over a period of one year i.e. from November 2012 to October 2013 and included all the patients operated for abdominal pathologies by any incision

**Inclusion criteria:-** The study included patients irrespective of age, sex, region, religion, profession, disease, type of surgery (elective or emergency), duration of surgery and type of anaesthesia.

**Exclusion criteria:-** Patients undergoing laparoscopic, minimal invasive urological/ gynaecological, vascular, thoracic-abdominal procedures and herniorrhaphies were not included, so were the patients who did not give their consent for the study.

**Summary and conclusion:-**Prevention is best way of managing this complication. Our study ends in following conclusions ,Prior stabilization with adequate hydration and correcting the electrolyte imbalance if any is must before proceeding for emergency laparotomies,Co-morbidities should be addressed as much they can be before proceeding for surgery.Proper sterilization should be ensured in emergency theatres too.

**KEYWORDS :** Dehiscence, herniorrhaphies, laparoscopic, laparotomies,

### Introduction

Wounds and their management are fundamental to the practice of surgery, as any surgical intervention will result in a wound. Postoperative wound complications represent one of the most frustrating and difficult occurrences experienced by surgeons. Wound dehiscence (burst abdomen) is a very serious postoperative complication which is associated with very high morbidity and mortality rates. It affects the patients by increasing distress and risk of mortality, the attendants by increasing the cost of treatment and wastage of their precious time in hospital, the surgeon for whom it is a disturbing reality and the hospital resources by increasing the healthcare cost due to prolonged stay.

Empirically, the ancients recognized that foreign bodies and dead tissues must be removed from wounds to prevent wound complications.

(Ries E, 1899). In the 16th century, Pare discovered that surgical destruction of tissue by pouring boiling oil into acute open wounds impeded healing and led to sepsis. His observation led to the maxim of all surgeons today – "Do not put anything in a wound you would not put in your own eye" (Wester C and Neumayer L, 2003).

Joseph Lister in 1865 was the first to use carbolic acid to prevent wound dehiscence (Lister J, 1867). However, fellow surgeons advocated proper hand wash with antiseptic, sterile clothes, sterile linen. Surgical instruments were sterilized with autoclave. Ehrlich, Flemming and Florey realized, with increasing sophistication, that bacteria were pathogens that prevent healing and led to sepsis and death. Control of bacteria by asepsis, antiseptics and antimicrobials heralded a new era in wound management (Lodhi FB, Asrar R, Akram M, et al., 2001).

Wound dehiscence is an acute wound failure. The rate of wound dehiscence reported in international literature varies from 1 to 2.6%

(Wolff WI, 1950; Efron G, 1965; Adrian S et al, 2000), while Indian subcontinent study shows and incidence much higher, as high as 6 to 12%, which is unacceptable and alarming (Hanif N, Ijaz A, Niazi UF, et al., 2000; Afzal S and Bashir MM, 2008). The associated mortality with wound dehiscence has been described within the range of 15 to 50% (Wolff WI, 1950; Afzal S and Bashir MM, 2008).

The aims and objectives of the study entitled "Epidemiology and Predictors of Wound Dehiscence in Abdominal Surgeries" were:

1. To find out epidemiology of wound dehiscence.
2. To evaluate various predictors leading to wound dehiscence.
3. Based on the observations, measures will be recommended for prevention of abdominal wound dehiscence.

### Material and methods

The study was conducted in the Department of Surgery, Government Medical College, Jammu over a period of one year i.e. from November 2012 to October 2013 and included all the patients operated for abdominal pathologies by any incision. The study included patients irrespective of age, sex, region, religion, profession, disease, type of surgery (elective or emergency), duration of surgery and type of anaesthesia.

Patients undergoing laparoscopic, minimal invasive urological/ gynaecological, vascular, thoracic-abdominal procedures and herniorrhaphies were not included, so were the patients who did not give their consent for the study.

All the patients and/or their relatives were explained in detail about the study. A written consent was taken from all the patients or their relatives.

A detailed history was taken from all the patients or their relatives where patient was not able to give history or was a minor. Thorough

general, systemic and local examination was performed in all the patients included in the study.

**Observations:-**

The present study comprised 600 patients operated for abdominal pathologies by any incision. The study included patients irrespective of age, sex, region, religion, profession, disease, type of surgery (elective or emergency), duration of surgery and type of anaesthesia. The mean age of patients was 37.51 20.39 years with range of 2 days to 85 years. There were 414 males and 186 females who were operated upon during one year period.

Examination of wound was done after 24 hours. Postoperative duration of swelling, discharge, dehiscence was recorded in detail, all other postoperative complications or aggravation of already existing diseases was also recorded. The study observed 65 patients with wound dehiscence. The observations made were as follows:

**Table 1: Age and sex distribution of wound dehiscence cases (n=65)**

Age group (in years)	Male		Female		Total	
	No.	%	No.	%	No.	%
20	5	7.69	0	0	5	7.69
21 – 30	3	4.62	1	1.54	4	6.16
31 – 40	6	9.23	0	0	6	9.23
41 – 50	8	12.31	2	3.08	10	15.39
51 – 60	11	16.92	4	6.15	15	23.07
61 – 70	17	26.15	5	7.69	22	33.84
71	1	1.54	2	3.08	3	4.62
<b>Total</b>	<b>51</b>	<b>78.46</b>	<b>14</b>	<b>21.54</b>	<b>65</b>	<b>100.00</b>

The age of patients varied from 2 days to 82 years, which included a total of 65 patients. The mean age ± standard deviation was found .....52.14 ± 18.42 years. Most patients were in the age group of 61 – 70 years (22; 33.84%) and least patients were in the age group of ≥ 71 years ..... (4.62%).

The study consisted of 51 (78.46%) males and 14 (21.54%) females. The male to female ratio was 3.64:1.

**Table 2: Distribution of wound dehiscence cases according to diagnosis (n=65)**

Diagnosis	Total	
	No.	%
Enteric perforation	16	24.62
Duodenal perforation	13	20.00
Obstruction	11	16.92
Malignancy	6	9.23
Trauma abdomen	5	7.69
Obstructed incisional hernia	2	3.08
Tuberculosis	2	3.08
Splenic pathology	2	3.08
Gastric outlet obstruction	1	1.54
Cholelithiasis with Choledocotomy	1	1.54
Other	6	9.23

Enteric perforation: 16 patients (24.62%) had enteric perforation as diagnosis.

Duodenal perforation: 13 (20%) had duodenal perforation as basic pathology.

Obstruction was found to be present in 11 (16.92%) of burst abdomens.

**Discussion**

The discussion on the subject of abdominal wound dehiscence is as old as history of modern operative surgery. The peri-operative mortality and long term morbidity associated with condition need medical and surgical preventive measures to be taken. With advance in surgical techniques, there has been considerable drop in the incidence of burst abdomen. In many reports the incidence in western world is somewhat between 2% - 4%. The incidence in Wolff's study was 2.6%. Mann et al (1962) reported an incidence of 2.72% while Lehman et al (1962) reported an incidence of 2.5%. But studies conducted in third world countries report high incidence even in present era. The results of our study are comparable to studies done in Indian sub-continent. In our

study 65 out of 600 patients who underwent surgeries in Department of General Surgery Government Medical College Jammu during one year period developed wound dehiscence giving an incidence of 1.83%, which is much higher as compared to developed countries but comparable to Indian sub-continent. In a study conducted by Lai AR et al (2011) incidence was 12%. Similar results were observed by Amin AQ et al (2013) in which 15 out of 130 developed wound dehiscence (11.5%). Numerous reasons have been ascribed for such higher incidence. In our study the high rate of wound dehiscence is due to many reasons. In our set up the emergency surgeries are usually performed for acute abdomen cases which have been deteriorated due to course of acute illness as patients are from far flung areas. In our part of world peripheral hospital set up is not upto mark. Diagnostic studies are not available due to which patient who needs surgery are managed conservatively there are referred to higher centre when their condition deteriorates. Many patients are mismanaged by Aalims, quacks, hakims and local dispensers. Most of the patients already have complications like septicaemia, fluid and electrolyte derangements at time of presentation to tertiary centre. Also, poverty plays a vital role in making patients malnourished and compelling them to seek cheaper treatment outside hospitals at local dispensaries.

Second factor responsible in emergency cases may be lack of proper sterilization in emergency setup. Third factor which plays a vital role in developing wound dehiscence is lack of experience on part of surgeon as emergency laparotomies are performed most of the time by surgical residents.

The age of patients in current study ranged from 2 days to 80 years with mean age of 52.14 years and standard deviation of 18.42 years. There appears to be an increase in the frequency of burst abdomen with advancing age. The highest incidence in present series is between 61 – 70 years (22; 33.84%) and least patients were in age group of ≥ 71 years (3; 4.62%). According to Maingot the average age is 45 years. Wolff (1950) found the age is of some importance etiologically for disruption which is more common (four times) in patients above age of 45 years than in the younger According to AI-Shamarry SAR (2002) mean age is 58 years and affected group was 61 to 70 years. Parmar, G et al (2013) found out that the highest incidence in the study was between 41 to 59 years of age. The frequency rises with cancer age i.e 45 to 60 years. The observation coincides with Hampton's observation which considers that there is a co relation but not a cause and effect relationship.

One of the interesting risk factor found in our study, is gender. In previous studies, males have been reported to have higher risk of developing abdominal wound dehiscence. The reason of this disadvantage is not entirely clear, one of the possible confounders may be smoking. Because most smokers from the studied generation tended to be male, and the effect of gender may be confounded with effect of smoking on wound healing. Smokers tend to have cough and more chances of acid peptic disease (perforation). Another explanation may be that men tend to build higher abdominal pressure than females. An increase in intra abdominal pressure results in higher strain on the wound edges. In our study 78.46% (51) of patients were male and remaining 21.54% (14) were females and ratio was 64:1 (approximately), which is in accordance to Parmer. G et al (2013), which had ratio of 4.5:1. Gabriella H VR (2009) conducted a study which had ratio of 3:1. According to Wergar SH (2005) percentage of male were 11% and female were 29%.

In the present study it was noted that pre-operative predisposing factors like anaemia, chronic obstructive pulmonary disease, sepsis, diabetes, jaundice etc. were associated with increased incidence of burst abdomen. In many patients, there were more than one factor leading to occurrence of burst abdomen. Joergenson and Smith noticed in their study.

In our study the high rate of wound dehiscence is due to many reasons. In our setup the emergency surgeries are usually performed for acute abdomen cases which have been deteriorated due to course of acute illness as patients are from far flung areas. In our part of world peripheral hospital set up is not to mark, diagnostic studies are not available due to which patients who need surgery are managed conservatively there and referred to higher centre only when their condition deteriorates. Most of the patients are already having complications like septicaemia and fluid and electrolyte derangements at the time of presentation to tertiary hospital. Also, poverty plays a

vital role in making patients malnourished and compelling them to seek cheaper treatment outside hospital at local dispensaries.

Second factor responsible in emergency cases may be lack of proper sterilization in emergency setup. Third factor which plays a vital role in developing wound dehiscence is lack of experience on part of surgeon as emergency laparotomies are performed most of the time by surgical residents. Fourth factor is, since patients are low and most of the time closure is done in hurry without giving further muscle relaxant by anaesthetist.

#### Summary and conclusion:-

Prevention is best way of managing this complication. Our study ends in following conclusions:

1. Prior stabilization with adequate hydration and correcting the electrolyte imbalance if any is must before proceeding for emergency laparotomies.
2. Co-morbidities should be addressed as much they can be before proceeding for surgery.
3. Proper sterilization should be ensured in emergency theatres too.
4. Dressing in the wards should be done in all aseptic conditions.
5. Important guidelines of care should be standardized, published, observed and followed so that people working in less ideal surgical centres can also benefit from this.

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