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# WOUND DEHISCENCE;
## FREQUENCY AFTER EXPLORATORY LAPAROTOMY

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**ABSTRACT... Introduction:** Exploratory laparotomy is a common procedure performed at the surgical floor, mainly in emergency. The need for exploration ranges from cases of abdominal trauma to those of preexisting abdominal ailments. Wound dehiscence, either partial or complete does occur after laparotomy and a number of studies have been performed to find out its frequency after laparotomy and to pin point the factors responsible for this complication. This study is designed to find out the frequency of wound dehiscence after exploratory laparotomy. Also it will compare frequency of wound dehiscence in trauma cases verses cases of abdominal pathology. **Objectives:** (1) To work out frequency of wound dehiscence after exploratory laparotomy. (2) To know the differential frequency of wound dehiscence after acute abdominal trauma compared with those having preceding underlying pathology and were explored. **Study Design:** It was a prospective observational study. **Settings:** Surgical units Allied Hospital , Faisalabad department of surgery. **Sample Size:** 200 patients operated in emergency and elective lists for abdominal exploration. **Sampling technique:** Non probability (convenience). **Exclusion criteria:** (1) Children less than 10 years (2) Sub costal incision (3) Pfennensteil incision (4) Morrison's' incision (5) Grid iron incision and; (6) Incisions to explore the kidney were excluded. (7) Those patients who expired in emergency just after exploration. **Inclusion criteria:** All patients above 10 years opened by midline laparotomy incision. **Results:** Out of 200 patients, 20 got wound dehiscence. It included 7 from Group I and 13 from Group 2. **Conclusion:** Improved surgical technique, early arrival in hospital and control of infection can bring the incidence of wound dehiscence after exploratory laparotomy down to a level comparable to international figures.

**Key words:** Dehiscence, Laparotomy, Serosanguinous

## INTRODUCTION

The reported incidence of wound dehiscence varies widely. It is more frequent after emergency than elective interventions; males are reported to have more incidence. It is either partial or complete. By definition it is said to involve deeper layers of the wound rather than skin. In essence, wound dehiscence results from increased intra abdominal pressure and poor wound healing, poor technique also contributing significantly. Wound dehiscence after exploratory laparotomy is better understood currently as compared to the days gone by. Layered closure appears to be associated with higher incidence of burst abdomen than mass closure[1]. Regular audit with feedback is an important instrument for quality improvement[2]. Although transverse abdominal wall

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incisions are based on better anatomical and physiological principles and early postoperative period is associated with fewer complications, midline is still incision of choice in conditions that require rapid intra abdominal entry or where the pre operative diagnosis is uncertain as it is quicker and can easily be extended[3].

Technique of wound closure has a key role to play in the prevention of wound dehiscence. Non absorbable suture like prolene should be used with adequate suture to wound length i.e. 4:1(Jenkin1976).

Local infection is the most important risk factor[4]. A strategy of Delayed Primary Closure (DPC) of appropriate dirty wounds produced a decreased wound infection rate compared to that with primary closure with out increasing cost and length of stay[5].

The purpose of the study was to know the frequency of wound disruption after laparotomy in our setup and to determine the effect of pre-existing disease on wound disruption as compared to those in which there was no preceding disease.

## MATERIAL AND METHODS

### Setting
This study was conducted in surgical unit I of Allied Hospital Faisalabad. This is a tertiary care institution with more than one thousand beds. All the patients meeting the criteria in all the three surgical units of Allied hospital were incorporated in the study .Both emergency and elective cases were included.

### Duration
It was a study of six months duration.

### Sample Size
A sample of 200 patients of all age groups and sex above 10 years was included in the study. Division of sample of 200 patients in to 2 groups of 100 patients each was made.

**Group 1** included the patients with acute abdominal trauma (blunt abdominal trauma, gun shots and stab wounds).

**Group 2** comprised of 100 patients who were explored having preceding underlying pathology of varied nature (typhoid perforation, perforated appendix and perforated duodenal ulcer).

### Sampling Technique
Non probability (convenience)
Sampling Selection
Inclusion criteria
Patients of both sexes, from all the socioeconomic and ethnic back grounds were included as they arrived in the emergency department.
The patients requiring re-exploration were also included in the study. The patients who were opened through other incisions initially (grid iron incision for (appendicectomy) and later converted to midline exploration were also included.

### Exclusion criteria
(1) The patients who were explored through the incision other than vertical midline (2)The patients who died immediately after having undergone laparotomy were excluded from the study.

### Study Design
It was an observational prospective study.

### Data collection procedure
Personal details of the patients were recorded. Details of history, examination, pre-operative resuscitative measures and investigations were recorded on the protocol proforma. Resuscitation has been an integral part of the management. Following investigations were carried out in every case before shifting him to theatre:

- Full blood count
- Serum electrolytes
- Urea and creatinine
- Blood sugar random
- X-ray chest
- X-ray plain abdomen (standing)
- ECG

Nasogastric tube and Foley's catheter were passed and intake, output was measured and recorded. The cases in

the sample were opened through a standard midline vertical incision after painting the abdomen with pyodine solution. Bard Parker knife was used to incise the skin while deeper tissues were cut by electrocautery and a pair of scissors. The per-operative findings were recorded and the abdomen closed with number 1 prolene. More than one suture lengths were used in case of larger wounds. A technique of abdominal closure involving suturing of anterior rectus sheath was standardized. Peritoneum was not sutured. The skin was sutured with black silk by placing interrupted sutures. The level of the operating surgeon ranged from senior registrar to last year resident.

The data about the behaviors of the wound during the post operative period was gathered in Surgical Unit 1. The wound was examined on 3rd, 5th and 9th day and the changes recorded in the protocol proforma. Partial or complete wound dehiscence was anticipated and treated. A record was kept in this respect. The patients at the time of discharge were advised to come for follow up in Surgical Out Patient Department.

## RESULTS

Amongst 200 patients, 20 patients (10%) got wound dehiscence. There was complete wound dehiscence in 13 cases (6.5%). Partial wound dehiscence occurred in 7 cases (3.5%). Partial wound dehiscence was defined as disruption of at least 1/3 of the total wound length involving the fascial layers excluding skin.

In Group I (100 patients) 56 were males (56 %) and 44 were females (44%).
In Group II (100 patients), there were 52 males (52 %) and 48 females (48 %) .

There were 7 cases of burst abdomen in Group I (7 %) and 13 cases in Group II (13 %)..In group 1 there were 5 male patients and 2 female patients with abdominal wound dehiscence. In group 2 there were 8 male and 5 female patients with abdominal wound dehiscence.

Partial dehiscence was observed in 3 cases in Group 1 and 4 cases in Group 11 (3% and 4% respectively).
The average time of dehiscence was between 5 to 7 post operative day.
The serosanguinous discharge was recorded in 30% of the cases.
Bowel sounds were absent in 20% of the cases preceding wound disruption.

## STATISTICAL ANALYSIS

1. There is no association between the sex and the acute abdominal trauma because the value of $X^2$ = 0.47096 which is statistically insignificant at 5% level of significance with 3 d.f. and table value as $X^2_{0.05(3)} = 7.81$.
2. Likewise, there is no association between the sex and the group having preceding disease because the value of $X^2$ = 2.4147 which is statistically insignificant at 5% level of significance with 3 d.f. and table value as $X^2_{005(3)} = 7.81$.

3. To test whether there is difference between the two techniques (i-e to know the differential frequency of wound dehiscence after acute abdominal trauma compared with those having preceding underlying pathology that were explored), the t-statistic signifies the difference as $t_{0.05(198)} = 1.645$ with calculated value as t = 12.2416.

## DISCUSSION

Wound complications after exploratory laparotomy are not uncommon. Acute wound failure has been addressed by different names i.e. wound dehiscence, burst abdomen, wound disruption and evisceration[6]. It is a serious complication with high morbidity and even mortality. The wound dehiscence rates reported in international literature varies from 1%[7-9] to 2.6%[10,11] while local studies show higher figures, up to 6%, which is unacceptable high and alarming. The rate of wound dehiscence in our study is also much higher that reported in the literature.

More males got this complication in our study and interestingly male predominance has been reported in many studies[6].

The onset of wound dehiscence may be the sign of uncontrolled underlying sepsis. If there is severe peritonitis, it may be wise to leave the wound open as laprostomy and no attempt is made to close the abdomen surgically[12]. In contaminated cases it may be wise to keep the superficial wound open and leave it for delayed primary closure.

Most of the cases that got the wound dehiscence in our study were operated in emergency and studies have supported this observation[6]. The midline incision for exploratory laparotomy has surpassed the paramedian incision over the years because it is simple, provides access to all the quadrants of abdomen, is rapid to open and close and usually blood sparing[13].

The surgical technique of wound closure is the single most factor responsible for wound dehiscence[14]. Choice of suture and using adequate suture to wound length ration i.e 4:1 (Jenkin 1976) and tension free closure are the key components. The quality of suture is also very important as a suture of bad quality may break down and cause wound disruption as was seen in two of our cases of abdominal trauma in which the poor quality Prolene thread was found broken. There is good evidence from randomized clinical trials and meta analysis that a continuous, running nonabsorbable suture is the method of choice for abdominal wall closure. Individual surgeons should continue to audit their own experience.

Preexisting abdominal pathology is a single most factor responsible for the wound dehiscence as shown in our study. Majority of these patients has had peritonitis for which exploratory laparotomy was performed. The abdominal wound dehiscence risk factor index identifies the patients at risk of dehiscence[15]. Multiple factors like anaemia, malnourishment, and infection have been mentioned in different studies[16-20]. Presence of serosanguineous discharge is the prime indicator of wound dehiscence and the presence of pus make the wound vulnerable for disruption.

## CONCLUSION

In the light of above discussion it can be said that many cases of wound disruption are avoidable. Good preoperative resuscitation of the patient in the form of fluid and electrolyte imbalance, antibiotic cover, proper intake and output maintenance, good surgical technique affect the outcome. Perioperative nutritional support is also very important as is vigilant post operative care.



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