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RESEARCH ARTICLE
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CLINICAL STUDY ON FACTOR INFLUENCING WOUND DEHISCENCE

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ABSTRACT:

Background: Wound dehiscence is defined as partial or complete disruption of an sutured abdominal laprotomy wound. It is one of the most dreaded complications which is faced by surgeons and one of greatest concern as there is high risk of evisceration, need for immediate intervention. Abdominal wound bursts and viscera are extruded mainly between the sixth to eighth day postoperatively, in around 1 -2% of laprotomy cases. Various risk factors are responsible for abdominal wound dehiscence eg. intraabdominal infection, emergency surgery, advanced age >65yrs, malnutrition, anaemia, hypoalbuminaemia, high BMI, systemic diseases like uremia and diabetes mellitus.

Method: 200 patients were studied in period from Oct 2019 to November 2021 who went emergency laprotomy at RIMS, Ranchi for various conditions like perforation obstruction etc and they were assessed for riskfactors associated with wound dehiscence including age BMI, details regarding presenting complaints, duration, associated diseases, significant risk factors like, anaemia, malnutrition, obesity was noted.

Result: Our study shows that of abdominal wound dehiscence incidence was more common in male gender 61%. In our study malespredominated as M:F ratio was 1.74:1. In our study the mean age of patients shown to be 46,27 years as the incidence ofduodenal ulcer perforation was more common in this age group54 (27%) of the patients studiedwere operated for hollow viscus perforation among which includes Duodenal ulcerperforation, ileal perforation, gastric perforation and jejunal perforation. In our study 82.5% of patients who underwent emergency surgery developed abdominal wound dehiscence ($p < 0.001$). In our study 51.5 ofpatients had anaemia, 45% had malnutrition, 35.5% had DM,28% had cough,45% had dyselectronemiaand sepsis being amajor determinant with 64.5% of the cases.

Conclusion: The most important factor in predicting wound dehiscence was Intraperitoneal infection. Factors act as determinant for wound dehiscence were– older age group, anaemia, male sex, obesity, malnutrition, patients with peritonitis due to bowel perforation, cough, Dyselectronemia. Postoperative abdominal wound dehiscence can be prevented by strict aseptic precautions, improving the nutritional status of the patient, improving patients respiratory pathology to prevent post operative cough and by proper surgical technique.

Keywords: Wound Dehiscence, Peritoneal Infection, Dyslipidemia, Malnutrition, Dyselectronemia

INTRODUCTION

Wound dehiscence is defined as partial or complete disruption of an sutured abdominal laprotomy wound with or without protrusion and evisceration of abdominal contents.[26]There are two types of wound dehiscence, complete or partial,In partial wound dehiscence, only the superficial layers of sutured wound or part of the tissue layers disrupts and In complete wound dehiscence, all the layers of the wound thickness are disrupted, exposing the underlying tissue and organs,which may be protrudes out of the separated wound. This can be seen in some cases of abdominal wound dehiscence.[27]

It is one of the most dreaded complications which is faced by surgeons and one of greatest concern as there is high risk of evisceration, need for immediate intervention and due to possibility of surgical wound infection, repeat dehiscence and formation of incisional hernia.[28]

Wound dehiscence carries with it a substantial morbidity. In addition there is also an increase in the cost of care both in terms of increased hospital stay, nursing and manpower cost in managing the burst abdomen and its complications. Many patients in India have a poor nutritional status and the presentation of patient with emergency.[30]

Abdominal wound bursts and viscera are extruded mainly between the sixth to eighth day postoperatively, in around 1 -2% of laprotomy cases. Various risk factors are responsible for abdominal wound dehiscence eg. intraabdominal infection, emergency surgery, advanced age >65yrs, malnutrition, anaemia, hypoalbuminaemia, high BMI, systemic diseases like uremia and diabetes mellitus. Good knowledge of these riskfactors is helps in prophylaxis.[32]

OBJECTIVE

To study incidence of wound dehiscence in elective and emergency operation and also incidence based on type of incision taken during operation and study contributing factors - local (type of incision, type of suturing of skin –simple/mattress) and systemic (anemia, hypoproteinemia, postoperative infection, postoperative pulmonary complications, obesity, comorbid conditions, drug use and others factors) .

MATERIAL AND METHOD

An elaborative study of these cases with regard to date of admission clinical history regarding the mode of presentation, significant risk factors, investigations, time of surgery and type of surgery and post operatively, study of diagnosis and day of diagnosis of wound dehiscence was done till the patient get discharged from the hospital.

In history, details regarding presenting complaints, duration, associated diseases, significant risk factors like, anaemia, malnutrition, obesity was noted. The study design was prospective observational study and data collected in proforma was analysed by SPSS-24. Details regarding the clinical diagnosis, whether the operation was conducted in emergency or electively, type of incision taken were noted. Intraoperative findings noted and classification of surgical wounds done accordingly

DISCUSSION

In this clinical study of abdominal wound dehiscence, all patients who developed abdominal wound dehiscence cases were included. In a study conducted between 2007 inMesologgi General Hospital and UrbanCommunity Teaching Hospital of 150 beds, 3500 abdominal laparotomies weredone in department of general surgery, showed that abdominal wound dehiscence incidence was more common in male gender (60%).[6]

Our study shows that ofabdominal wound dehiscenceincidencewas more common in male gender 61%. In our study malespredominated as M:F ratio was 1.74:1. The higher incidence of hollow viscus perforation and intestinal obstruction in malewas probably the cause of high male predominance.

In a study on 12,622patients who undergo exploratory laparotomy conducted in hospital universitirio Dr. Joseph, Trueta, Spain showed that mean age of patients with wound dehiscence was 70 years.[17]In a study conducted in 2007, at Mesologgi General Hospitaland Urban Community Teaching Hospital of 150 bed,3500 abdominal laparotomies where performed in department of general surgery of showed that mean age of 69.5years.[6] In our study the mean age of patients shown to be 46,27 years as the incidence ofduodenal ulcer perforation was more common in this age group. Our study shows that abdominal wound dehiscence was more common in patients operated for peritonitis due to hollow viscus perforation, intestinal obstruction andin which wounds were classified as contaminated. 54 (27%) of the patients studied were operated for hollow viscus perforation among which includes Duodenal ulcerperforation, ileal perforation, gastric perforation and jejunal perforation.

In department of general surgery of Mesologgi General Hospital and Urban CommunityTeaching Hospital, a study conducted in 2007, 3500 abdominal laparotomies were performedshows that 60% of the patients who were developed wound dehiscence were operated in emergency.[6] In our study 82.5% of patients who underwentemergency surgery developed abdominal wound dehiscence ($p < 0.001$).

At Surgical unit IV DHQ hospital, Faisalabad, a study conducted fromJanuary 2002 to June 2003, the main risk factors associated with wound dehiscence were obesity, uraemia, hypoprotinemia, obesity, diabetes mellitus, chronic liver disease etc. performed in department of surgery of Mesologgi General Hospital and Urban Community TeachingHospital of 150 beds , a study conducted in 2007,in which 3500 abdominal laparotomies were performed. The study concludes thatanaemia, uraemia, sepsis, ascites, steroid use, hypetension wereother risk factors acting as determinants for wound dehiscence.[6] In our study 51.5 ofpatients had anaemia, 45% had malnutrition, 35.5% had DM,28% had cough,45% had dyselectronemiaand sepsis being amajor determinant with 64.5% of the cases.

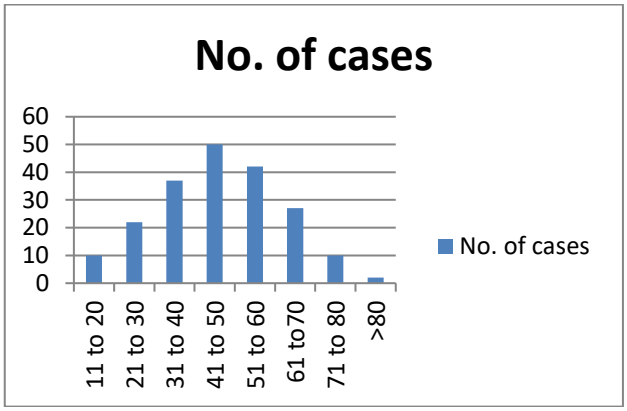
At University ofCopenhagen, Hvidovre Hospital, a Study conducted in Department of Surgical Gastroenterology, in 2001shows that the incidence of abdominal wound dehiscence and burst abdomen is more common in patients with vertical incision than in those with transverse incision ($p = 0.0001$).[13]

At Department of Surgery Sundsvaell County Hospital, Sweden Astudy concludedoverweight (BMI > 25) as a risk factor for wound infection.

RESULT

AGE WISE DISTRIBUTION OF SUBJECTS

Age	No. of cases	Percentage
11 to 20	10	5
21 to 30	22	11
31 to 40	37	18.5
41 to 50	50	25
51 to 60	42	21
61 to70	27	23.5
71 to 80	10	5
>80	2	1
TOTAL	**200**	**100**



In our study, Majority of patients belongs to the age group between 41 to50years, youngest patient was 11 years old and oldest patient was 88 years old. Patients mean age who got affected was 46.27yrs(S.D=15),margin of ages show very less incidence.

SEX WISE DISTRIBUTION

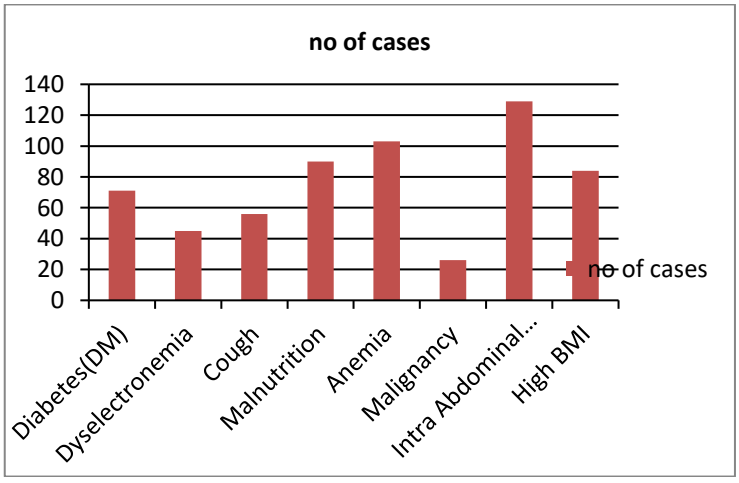
GENDER	GENDER	PERCENTAGE
MALE	122	61
FEMALE	78	39

Out of 100 cases, 69 cases were male and 31 cases were female.the study shows higher incidence of dehiscence in males.

COMORBID CONDITIONS

Table No 3: Co morbid condition at the time of admission

Conditions	No of cases	Percentage
Diabetes(DM)	71	35.5
Dyselectronemia	45	22.5
Cough	56	38
Malnutrition	90	45
Anemia	103	51.5
Malignancy	26	13
Intra Abdominal infection (IAI)	129	64.5
High BMI	84	42

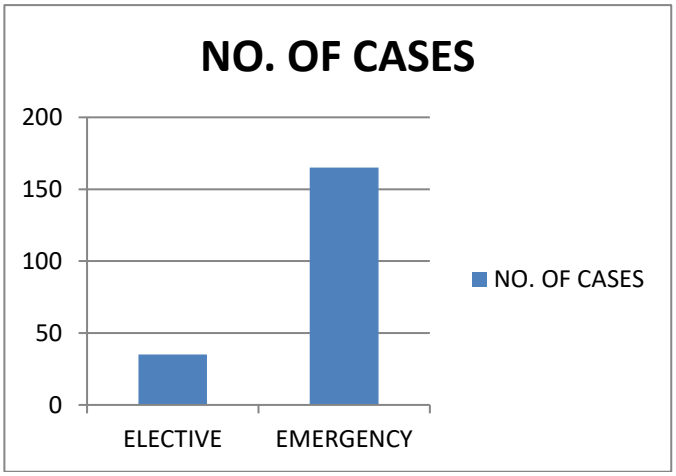


Among 200 patient, 71 patient having diabetes, 45 patient having dyselectronemia,56 patient having cough,90 patient were malnutrised,103 patient showing hb<10,26 patient were of malignancy, 129

patient had intra abdominal infection,84 patients had high BMI.The data shows correlation of comorbidities with wound dehiscence.

EFFECT OF EMERGENCY SURGERY IN DEVELOPMENT OF ABDOMINAL WOUND DEHISCENCE

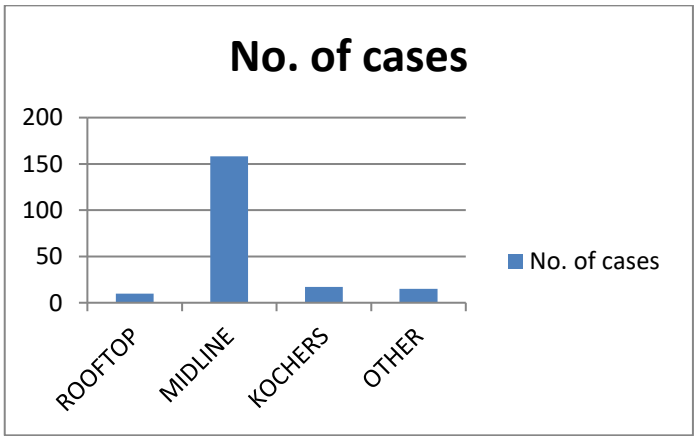
SURGERY	NO. OF CASES	PERCENTAGE
ELECTIVE	35	17.5
EMERGENCY	165	82.5



Surgery: In our study, out of 200 cases, 165 cases (82.5%) were operated asemergency surgery and 35cases (17.5%) as elective surgery.the data shows high incidence of wound dehiscence in emergency cases.

FREQUENCY OF ABDOMINAL WOUND DEHISCENCE IN RELATION TO TYPE OF INCISION

Type of incision	No. of cases
ROOFTOP	10
MIDLINE	158
KOCHERS	17
OTHER	15
TOTAL	200



Among 200 operations in which wound dehiscence occur, 10 operation done by rooftop incision,158 operation by midline laprotomy incision, 17 by kochers incision. The data shows higher incidence of wound dehiscence in midline laprotomy incision.

VARIOUS ABDOMINAL PROCEDURES LEADING TO ABDOMINAL WOUND DEHISCENCE

Procedure	No. of cases
Perforation closure	42
Resection and anaestomosis	37
Appendicectomy	8
Ileostomy	29
Cancer resection	26
Adhesolysis	20

Among 200 procedure after which wound dehiscence occur , in 42 cases perforation closure done, in 37 cases resection and anaestomosis done, in 8 cases appendicectomy done, in 29 cases ileostomy done, in 26 cases cancer resection done and in 20 cases adhesolysis done.The data shows hihest incidence after perforation closure.

DISTRIBUTION OF PATIENTS WITH ABDOMINAL WOUND DEHISCENCE ACCORDING TO UNDERLYING INTRAABDOMINAL PATHOLOGY

Diagnosis	No. of cases
Hallow visceral perforation	54
Ruptured liver abscess	14
Intestinal obstruction	40
Malignancy	26
Blunt trauma abdomen	15
Apprndicular perforation	8
Kochs abdomen	10

Out of 200 cases 54 pts had peritonitis secondary to hollow viscus perforation,40 diagnosed had intestinal obstruction, 26 cases were of malignancy. The data shows higher incidence of wound dehiscence in hallowviscus perforation.Appendicular perforation shows least incidence of wound dehiscence.

FREQUENCY OF ABDOMINAL WOUND DEHISCENCE ACCORDING TO BODY MASS INDEX

BMI	NO. OF CASES
>25	116
<25	84

Out of 200 cases 116 pts had B.M.I >25 and 84 patients had B.M.I <25.The data shows high incidence of dehiscence in low BMI patients.

PREVALENCE OF ABDOMINAL WOUND DEHISCENCE IN RELATION TO ANEMIA

Hb%	NO. OF CASES
<10	103
>10	97

Out of 100 cases 97 patients had Hb% more than 10g% and 103 patients had Hb%less than 10%The data shows high incidence of wound dehiscence in anaemic patients.

PREVALENCE OF WOUND DEHISCENCE IN RELATION TO ALBUMIN

S. ALBUBIN	NO. OF CASES
<2.9gm/dl	116
>2.9gm/dl	84

Out of 200 cases 116 patient had hypoalbuminemia. The data shows high incidence of wound dehiscence in hypoalbuminic patients.

PREVALENCE OF WOUND DEHISCENCE IN RELATION TO SERUM ELECTROLYTE

S. ELECTROLYTE	NO. OF CASES	PERCENTAGE
DERANGED	45	22.5
NORMAL	155	77.5

Out of 200 cases 45 patients had deranged serum electrolytes.The data shows correlation of wound dehiscence with deranged serum electrolyte.

PREVALENCE OF WOUND DEHISCENCE IN RELATION TO DERANGED RFT

RFT	NO OF PATIENT
NORMAL	129
DERANGED	71

Among 200 patient of wound dehiscence 71 patient shows deranged RFT .The data shows correlation of RFT with wound dehiscence.

DURATION OF HOSPITAL STAY

AVERAGE STAY	20.48
RANGE OF STAY	15- 27

Average stay was 23.2 which increases economic burden both on hospital and patients.

CONCLUSION

- The most important factor in predicting wound dehiscence was Intraperitoneal infection.
- Factors act as determinant for wound dehiscence were– older age group, anaemia, male sex, obesity, malnutrition, patients with peritonitis due to bowel perforation, cough, Dyselectronemia and Deranged RFT.
- Burst abdomenwas more prevalent in Emergency procedure
- Investigations like RBS, Hb%, RFT, chest x-ray, LFT, may help to detect predisposing factors for wound dehiscence.
- Improper suture technique, midline incisions and improperaseptic precautions may lead to wound infection and then wound dehiscence.
- Postoperative abdominal wound dehiscence can be prevented by strict aseptic precautions, improving the nutritional status of the patient,improving patients respiratory pathology to prevent post operative cough and by proper surgical technique.

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