



ORIGINAL RESEARCH PAPER

GENERAL SURGERY

STUDY OF BURST ABDOMEN : CAUSES AND PREVENTION

KEY WORDS: Burst Abdomen, Death, Incidence, Causes, Prevention.

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ABSTRACT

Burst abdomen is a severe post-operative complication experienced by Surgeons and Gynecologist, who do a significant amount of surgery. Burst abdomen usually occurs due to various predisposing factors which can be prevented to some extent by having knowledge regarding them. The purpose of this study was to assess the patients, who had undergone laparotomy and developed burst abdomen. Present study is comprised of 51 cases of Burst Abdomen following 2300 laparotomies performed in 2 years period in surgical and Gynaecology& Obstetrics units of Hospital. Both Elective and Emergency cases were included.No exclusion criteria. The clinical diagnosis of the patients was done such as physical examination, hematological investigations The frequency of burst abdomen was significantly higher in older age group as compared to younger. The most common risk factors as malnutrition (20.3%), followed by obesity (12.5%), anemia (12.4%), wound infection (11.9%), coughing (9.6%), and distension (8.5%). Burst abdomen is a serious complication of impaired wound healing. More studies are needed to spread knowledge about it to reduce its incidence. The incidence of Burst Abdomen ranges from 0 to 5.8 % as evident from the literature available. This study was intended to identify various factors responsible for burst abdomen and to asses preventive measures. Transverse incisions, midline incisions and other anatomical incisions heal fast and their closure is significantly stronger then other longitudinal and muscle cutting incisions which are more prone to burst abdomen.Out of total 2300 laparotomies 1079 were surgery cases (375 Elective & 704 Emergency) and 1221 laparotomies from Gynaecology & obstetrics (483 elective & 738 Emergency).Total Laparotomies 2300, Total cases of Burst Abdomen 51 (2.17%).Incidence of burst abdomen was 3.98% (43)in General surgery patients and 0.6%(8) in G&O patients. Overall incidence in both groups nearly equal in Elective & emergency laparotomies. 26 cases in elective group and 25 cases in emergency groups.

INTRODUCTION

The incidence of Burst Abdomen ranges from 0 to 5.8 % as evident from the literature available.

Wolff W.I had very aptly commented that incisional wound is the product and responsibility of surgeon. Burst Abdomen or Abdominal wound disruption is a grave complication following any surgical operation in either sex at any age.Ellis H .This study was intended to identify various factors responsible for burst abdomen and to asses preventive measures. Madelung stated that the entity of Burst abdomen has been recognized since the earliest days of abdominal surgery. In 1899 Burst abdomen was first reported with mortality rate of 67%.Ries implicated abdominal distension in the causation. Wallace has found multiple factors responsible for burst abdomen in his study and those factors were sepsis, nephritis and Anaemia.Wolbach and Howes provided histological proof of wound healing failure in Vitamin C deficiency. In 1936 Hinton and In 1937 Jenkins blamed rapid absorption of catgut sutures due to allergic reaction created by catgut itself, leading to weakening of wound.In 1937 Glen and Moor and after that many researchers concluded that the etiology is multifactorial including old age, male sex,infection, Anaemia, Malignancy, Renal failure, Drains, raised post operative intra abdominal pressure by distension, cough, vomiting etc. Ellis H, Twidle & Long **classified** Burst Abdomen as follows.

- A) Partial disruption where one or more layers have separated but either skin or peritoneum remained intact.
- B) Where all layers have given way. This may be or may not be associated with evisceration.

Standenv A had classified Burst abdomen as Early or lag phase (within to 5th post operative days) and Late(5th post operative days onwards. In early cases Raised Intraabdominal pressure due to distension, cough, vomiting and poor surgical technique, catgut material were implicated and in late cases infection, haematoma and deficiency states. This study highlighted the fact that in early stages wound is weak and depends upon strength of suture

material and after fifth days it starts getting strong with fibroplasias and connective tissue formation. **Etiopathology of Burst Abdomen:** Almost all the workers have concluded that the complication is multifactorial and factors are divided into General factors and Local factors. Ellis H, Baily and Love, Eliis, Shwartz S I.**General factors are** 1) Old Age. 2)SEX: Majority of workers agreed upon the male predominance in this complication due to greater physical activity, abdominal breathing and less elastic abdominal wall. Melbert and Colp attributed its less occurrence in females to their inherent tendency to withstand the intra abdominal pressure. The M:F ratio varied from 1.6:1 to 3.5: 1. 3) **Primary and Associated diseses** like **Malignancy** in 25% cases as reported in various series pointed out by Junco TD and Lange H due to deficiency states. **Jaundice** : Ellis & associates and Efron found 18% and 10.7% incidence of burst abdomen in jaundiced patients. **Uraemia:** Burst abdomen due to wound failure is more frequently associated with uraemia ..Nayman and Mcdermot

Diabete Mellitus: Idem and Rosenthal & Dibbesac proved the role of Diabetes mellitus as an important contributory factor leading to impaired and delayed wound healing in the occurrence of burst abdomen. **Obesity:** Moller RJ and Mayo 7 Lee found obesity as a significant causative factor.

Junco TD and Lange H and other researchers found significant role of post **operative Chest complications** like Atelectasis, Pneumonia and other chest diseases like Asthma, chronic Bronchitis. Jorgenson and Smith Harvey and Howes demonstrated **protein deficiency**, Winfeild JN & Mersheminer proved **Vitamin C deficiency** and Douglas, Tera and Aberg demonstrated **Anaemia** as other causative factors for the occurrence of Burst Abdomen. Savlav & Dunphy and Regan et alproved therole of Corticosteroid in failure of wound. Elective or emergency surgery.Emergency laparotomy showed high incidence of dehiscence.Laparotomy after Trauma to abdominal Wall.**LOCAL FACTORS: 1. Increased Intra Abdominal Pressure.**Price in his

article Stress, Strain and sutures demonstrated the role of raised intraabdominal pressure on weakening of the suture. Majority of Authors Have concluded that the increased post operative intraabdominal pressure due to cough, vomiting, Hicups, ileus, straining at stools or at micturition is the most important causative factor. **2. INCISIONS:** Transverse incisions, midline incisions and other anatomical incisions heal fast and their closure is significantly stronger than other longitudinal and muscle cutting incisions which are more prone to burst abdomen. Keil et al, Sloan. **3. Suture Material:** When laparotomy wound sutured with Catgut only the incidence of burst abdomen is high. Goligher and Colleagues. Early dissolution is the reason. Alexandra and Pruddens.

4. Irradiation, Presence of Colostomy, Fistula, drains, Infection are other causative factors for laparotomy wound failure. Crandon JH & others, Junco TD & Lange H, Efron G, Doulas, Ellis H.

MATERIAL AND METHOD

Our Study was conducted at Government Medical college Nagpur for two years. Total 51 cases of burst abdomen occurred in 2300 laparotomies performed in all surgical and Gynaecology and obstetrics departments including all elective and emergency procedures. Present study is comprised of 51 cases of Burst Abdomen following 2300 laparotomies performed in 2 years period in surgical and Gynaecology & Obstetrics units of Hospital. Both Elective and Emergency cases were included. No exclusion criteria.

DISCUSSION

In our study, the incidence of Burst abdomen in this study of 51 cases was 2.17% and matches with the Macellam et al, Efron G. **Sex:** As reported by Halasz N A, Ponka J, White & Cook male sex predominates in occurrence of burst abdomen. Our M:F ratio of 1.7:1, tallies well with their findings. This is attributed to greater muscular activity and less elasticity of abdominal wall in males. **Age:** In the present study majority of cases of burst occurred in older age group and this finding compares well with those of Wolf W I, Lange H & Ponka J. This was attributed to defecancy states and slowing of healing process and associated co-morbid conditions in old age.

Mollar R J, Efron G Sedwick & Sullivan Jr and various other researchers have implicated the **role of jaundice, Uraemia, Diabetes Mellitus, Chronic bronchitis, Pulmonary Koch's, obesity** in the occurrence of Burst abdomen. In the present study these factors were found to be present in significant percentage of cases. The incidence was found to be much higher in laparotomies in contaminated cases 10.5% as compared to clean cases 1.6%. This matches well with the study of Marsh RL, Whipple AO, Schwartz. Debris, infection, haematoma, foreign body were the factors responsible for weakening of the wound. **Preventive Measures:** Use of Tension Suture was recommended by Moller RJ, Goligher & colleagues, Efron G, when there is an anticipation of Burst abdomen. They also found that Mass closure (one layered closure) is far superior to layered closure when occurrence of burst abdomen is concerned. Use of Catgut sutured material was condemned by majority of workers and Alexander and Pruddens demonstrated its early dissolution as the main factor weakening the laparotomy wound. Use of Prolene, poly glycolic Acid, Poly Amide sutures were highly recommended, in the literature.

RESULT

Out of total 2300 laparotomies 1079 were surgery cases (375 Elective & 704 Emergency) and 1221 laparotomies from Gynaecology & obstetrics (483 elective & 738 Emergency). Total Laparotomies 2300, Total cases of Burst Abdomen 51 (2.17%). Incidence of burst abdomen was 3.98% (43) in General surgery patients and 0.6% (8) in G&O patients. Overall incidence in both groups nearly equal in Elective & emergency laparotomies. 26 cases in elective group and 25 cases in emergency groups. Male female ratio was found to be 1.7:1 in burst abdomen. AGE: below 40 years the incidence of burst was 35.3% (18 cases) and above 40

years 64% (33 cases). Other factors: Malignancy was present in 25.5% (13 cases) of burst abdomen, Intestinal obstruction in 27.5% (14 cases), Perforation and other inflammatory conditions were associated with 25.5% (13 cases) and other conditions (surgical & G&O) were associated with 21.5% (11) cases of Burst.

Bowels were involved in highest number of burst abdomen cases. 42.12% (22 cases), followed by Stomach 23.53% (12) cases and Uterus 15.65% (8) cases. Chest Disease (Chronic Bronchitis, asthma, Pneumonitis, Pulm. Koch's etc) were found to be associated with 21.56% (11) cases of burst abdomen followed by Obesity 13.5% (9) cases, Diabetes Mellitus and Uraemia with 5.9% incidence of Burst each and jaundice in 4% (2) cases. **POST OPERATIVE FACTORS:** Abdominal strain (Cough, Vomiting, Distension and Straining at Micturition and constipation) was present in 43% (22) cases of Burst Abdomen. Laparotomies associated with contaminated wounds showed 10.55% (18/173 cases) incidence of burst as compared to clean wounds 1.65% (33/2127). Recovery from Anaesthesia was not smooth in 61% (31) cases in which burst occurred. Patients showed variety of symptoms of straining, coughing, vomiting, struggling, retching etc. The incidence of burst abdomen was found to be higher in non-Anatomical (vertical laparotomy incisions 92.15% (47 cases) and in Anatomical incisions Transverse 7.85% (4). The incidence of Burst Abdomen was more in Lower Abdominal incisions 60.8% (31). The burst abdomen occurred in 2.27% cases where additional tension sutures were not used and 0.99% where tension sutures were used. The incidence of Burst Abdomen was 7.85% when post operative recovery period was uneventful and 92.15% where post operative period was not smooth. The incidence of Burst abdomen was significantly higher (>3%) when Anti-malignant drugs, Steroids, Anaemia, Hypoproteinemia were associated.

In 86.5% (44) of cases suture material was found to be absent (early dissolution) in the wound.

MORTALITY: 21.57% (11).

CONCLUSION

Burst Abdomen is an unpredictable event in most cases and is a grave complication after laparotomies and must be prevented with appropriate measures of safe suturing technique using strong and reliable suture material.

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