



STUDY OF STAGED ABDOMINAL REPAIR IN ACUTE ABDOMINAL SURGICAL PROCEDURES AND ASSOCIATION OF OUTCOME WITH HEMOGLOBIN AND SERUM PROTEIN LEVELS

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ABSTRACT

INTRODUCTION Compartment syndrome is raised intraabdominal pressure resulting in alteration in respiratory mechanism, hemodynamic parameters, renal as well as cerebral perfusion. Abdominal compartment syndrome has tremendous relevance in the practice of surgery and care of critically ill patients because of its effects on multiple organ systems. This study aims to highlight the importance of staged abdominal repair in acute abdominal surgical procedures and correlate with complications. **METHODS:** This study was carried out in a medical college and included 45 cases over a period of 15 months and divided between control and study group. Intravesical pressure was used as a method of measuring the intra abdominal pressure. In control group once the definitive emergency abdominal surgical procedure was over and bowel was seen above the abdominal wound conventional double layered primary closure was done with Vicryl. In study group temporary closure was done with either prolene mesh or simple urobag/drain. The aponeurosis was left intact and the mesh/urobag/drain bag was stitched along the wound margin to the skin. Opsite was applied to the undersurface of mesh to prevent fistulization. Staged repair was done based on intravesical pressure measurement every 48 to 72 hours. When IAP was less than 10 final aponeurosis to aponeurosis closure was done. Hemoglobin and s. proteins levels were measured every 72 hours. **RESULTS:** Majority of the patients presenting with acute abdomen were confined to the age group of 20-50 years mainly in the age group of 30 to 45 years. Perforation peritonitis and intestinal obstruction were the leading cause of acute abdomen. Maximum number of patients were I grade 3 hypertension. Incidence of morbidity i.e. burst abdomen, faecal fistula, wound infections etc. Were more in control group than study group. Mean hospital stay was more in the study group as staged repair was done in them. **CONCLUSIONS:** It was concluded in our study that staged closure of abdomen is effective in select group of patients and there has been improvement in the morbidity and mortality rates. The patients with low IAP after laparotomy usually had uneventful follow up and good prognosis. While patients with high IAP and less fall in IAP had eventful follow up and significant morbidity and mortality. Patients in the study group with hb levels less than 10 and s. protein less than 3.5 had more morbidity.

KEYWORDS : Acute abdomen, Staged closure, Infection, Intraabdominal Pressure, hemoglobin, s. protein.

Introduction:

Intra abdominal hypertension (IAH) develops in acute as well as in chronic form.

ACUTE

1. Spontaneous- Perforation peritonitis, intra abdominal abscess, intestinal obstruction, ruptures aortic aneurysm, tension pneumoperitoneum, acute pancreatitis and acute mesenteric ischemia.

2. Post perative - Post operative peritonitis, intra abdominal abscess, ileus, intraperitoneal haemorrhage, acute gastric dilation

3. Post traumatic - Intra peritoneal and retroperitoneal bleeding, post resuscitation visceral oedema.

4. Iatrogenic - Laparoscopic procedures, abdominal packing, abdominal closure under tension, reduction of a massive parietal or diaphragmatic hernia.

Chronic: Ascites, Large abdominal tumour, pregnancy, chronic ambulatory peritoneal dialysis

Grades of IAH

Grade 1: 10-15 cm of H₂O

Grade 2: 16-25 cm of H₂O

Grade 3: 26-35 cm of H₂O

Grade 4: > 35 cm of H₂O

Staged Abdominal Repair:

STAR is a technique of serial operations, planned either before or during the index operation and performed every 24- 48 hours or as required with temporary closure of abdomen and ending in a final aponeurosis to aponeurosis closure of abdomen.

Virtually all materials which are non reactive to the body tissues can be used for temporary closure of abdomen.

Mortality can be reduced upto 50 % by utilization the concept of STAR.

PATIRNTS WHO HAVE Hb levels > 10 gm% and s. protein > 3.5 have a better prognosis as compared to others.

Material and Methods

The present study was carried out in a govt. medical college extending between a period of 15 months by collaboration of Surgery and Pathology department.

There were total 45 patients who underwent emergency laparotomy for various reasons were divided in control (25 pts) and study group (20 pts).

Inclusion criteria

Preoperative:

1. Tense and tender abdomen confirmed by palpation.
2. Oliguria, if the urine output is less than 0.5ml/kh/hr.
3. Patient's vital parameters reflecting deterioration (if more than two of these factors are present):

a. Respiratory rate <12/min or >22/min.

b. Pulse rate <60/min or >100/min

c. Presence of dehydation.

d. Blood pressure <90mmHg systolic or on inotropic support.

4. Intraabdominal pressure > 20 cm H₂O

Intraoperative:

The bowel is seen to protrude above the level of abdominal wound.

The major inclusion criteria was IAP > 20 CM OF H₂O and gut seen above the level of abdominal wound.

Exclusion criteria:

1. Pt. younger than 15 years of age.

2. Patient's whose intra abdominal pressure was less than 20 cm of H₂O

All patients in both groups have their blood hemoglobin and serum proteins measurement every 48 hours during the course of hospital admission.

Intravesical pressure measurement was used to measure the intraabdominal pressure.

Technique of staged abdominal repair:

Once the definitive procedure was over and the gut was seen above the

abdominal wound, in the control group the conventional double layered primary closure was done with Vicryl.

In the case group temporary closure was done with either prolene mesh or simple urobag/ drain bag .

The aponeurosis was left intact and the mesh/urobag/drain bag was stitched along the wound margin to the skin.

Opsite was applied to the undersurface of mesh to prevent fistulization. Patient was reviewed after 72 hours, considering the fall in IAP and other local factors, a segment of mesh/urobag was cut out in the centre and margins reapproximated with either Silk 2.0 or Ethilon 2-0 RC so that a controlled tension was exerted over the wound margins avoiding artificially created ACS.

This was repeated every 2-3 days and when IAP was < 10 cm of H₂O final aponeurosis closure was done with freshening of skin margins 8-days later with prolene suture.

Hemoglobin and s.proteins were measured every 72 hours in both groups and correlated with outcome.

AGE DISTRIBUTION IN ACUTE ABDOMINAL EMERGENCIES

AGE(YEARS)	CASE	%	CONTROL	
16-25	5	25	4	16
26-35	2	10	5	20
36-45	7	35	9	36
46-55	1	5	2	8
56-65	-	-	2	8
66-75	5	25	2	8
76-85	-	-	1	4
Total	20	100	25	1

Etiological relation in acute abdomen

Case Group

Etiology	No. of cases	%
Perforation peritonitis	10	50
Acute Intestinal Obstruction	8	40
Blunt Injury Abdomen	2	10
Total	20	100

Control Group

Etiology	No. Of Cases	%
Perforation peritonitis	16	64
Acute Intestinal Obstruction	8	32
Blunt Injury Abdomen	1	4
Total	25	100

IAH GRADE PRESENTATION OF ACUTE ABDOMEN

CASE GROUP

GRADE	NO. OF CASES	%
II	6	36
III	11	55
IV	3	15
TOTAL	20	100

CONTROL GROUP

GRADE	No. of cases	%
II	9	36
III	12	48
IV	4	16
TOTAL	25	100

Outcome of pts. In case group

Etiology	Outcome	No. Of cases
PERFORATION PERITONITIS (10)	Discharged	6
	Burst Abdomen Fistula - 0	2
	Gross wound infection	1

	Poatoperative SAIO	1
	Certified	0
AIO (8)	Discharged	5
	Burst Abdomen Fistula - 1	0
	Gross wound infection	1
	Poatoperative SAIO	2
	Certified	1
		20
BIA(2)	Discharged	1
	Certified	1
Total		20

OUTCOME OF PTS. IN CONTROL GROUP

ETIOLOGY	OUTCOME	NO.OF CASES
Perforation Peritonitis (16)	Discharged	7
	Burst Abdomen	1
	Fistula	3
	Certified	5
AIO (8)	Discharged	3
	Burst Abdomen	3
	Fistula	1
	GB Perforation	1
BIA(1)	Burst Abdomen	0
	Certified	1
Total		25

Hb and S. PROTEIN LEVELS IN CASE AND CONTROL GROUPS

GROUP	Hb>10gm%	S.Protein > 3.5
Control	15/25	12/25
Case	10/20	12/20

Overall Outcome In Case Group and Control Group

PARAMETER	CASE GROUP	Percentage	CONTROL GROUP	Percentage
Discharged	12	60	10	40
Burst Abdomen	2	10	5	20
Fistula	1	5	4	16
Gross wound infection	1	5	-	-
Others	1	5	1	4
Certified	3	15	5	20
Total	20	100	25	100

Conclusions

Staged abdominal closure is a technique of temporary abdominal closure which combines the principles of planned re-laparotomy and laparostomy.

It involves a commitment at the time of the initial operation to perform multiple surgical procedures at fixed intervals .It allows superior control of peritoneal contamination and earlier detection of anastomotic leaks.

In our study the most common cause of acute abdomen in both the groups was perforation peritonitis followed by intestinal obstruction.

Maximum number of cases were in grade III intra abdominal hypertension in both groups followed by grade II Intra abdominal Hypertension.

Increasing IAP leads to renal impairment.

In case group mortality in grade IV IAH was 63.67% while in grade III IAH was 7%.

In control group mortality in grade IV IAH was 100% while in grade III IAH was 7.2%

Overall mortality in case group and control group was 14% and 19% respectively.

Morbidity in the form of complications was significantly less in both groups in pts having hb > 10 gm% and s. proteins > 3.5

Based on the above findings we can conclude that the open abdomen technique STAR has been found to be effective in the select group of patients.