International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: SJIF: 5.995
Available Online at www.journalijcar.org
Volume 6; Issue 11; November 2017; Page No. 7363-7366
DOI: http://dx.doi.org/10.24327/ijcar.2017.7366.1133

Research Article

CLINICAL STUDY AND MANAGEMENT OF ABDOMINAL TRAUMA CASES WITH HOLLOW VISCUS INJURY

Avinash Pawara., Kalpesh Chaudhari* and Umang trivedi

3/12 old air India Colony, Santacruz East, Mumbai

A R T I C L E I N F O

Article History:
Received 17th August, 2017
Received in revised form 29th September, 2017
Accepted 30th October, 2017
Published online 28th November, 2017

Key words:
Small Bowel, Ileum, Mortality

A B S T R A C T

Abdominal trauma is one of the important factor of trauma related deaths.Our study focused on nature, prevalence, clinical presentation and investigation in abdominal trauma. As per our study small bowel was most common organ affected of which most common part being ileum and mortality was 7.5%

INTRODUCTION

Abdominal trauma continues to be etiological factor in large number of cases of trauma related death. There are large number of factors that are responsible for excessive incidence of morbidity and mortality in these cases. Abdominal injuries are frequently encountered in the management of trauma patients. Of all patients in the 2009 NTDB, 13% sustained abdominal injuries, associated with an overall mortality rate of 7.7%.[1] During the evaluation of the injured patient, the abdomen is of high priority because the vital nature of the contained organs and structures. Blunt trauma can result in the laceration of solid organs usually causing bleeding, which in its most severe form manifests as haemorrhagic shock or as visceral perforation of the GI tract. Penetrating trauma to the abdomen can result in laceration of solid organs and perforation of hollow organs, which must be discovered and repaired at the time of laparotomy.[2] Abdominal trauma is an injury to the abdomen. It may be blunt or penetrating and may involve damage to the abdominal organs. Signs and symptoms include abdominal pain, tenderness, rigidity, and bruising of the external abdomen.[3]

The following are the useful diagnostic methods in abdominal trauma.[4]

1. Four quadrant abdominal tap.
2. Ultrasound of the abdomen.
3. Plain radiography and contrast studies.
4. Diagnostic peritoneal lavage.
6. Angiographic studies.
7. Radionuclide imaging.
8. Laparoscopy.

The diagnosis of hollow viscus injury with advanced diagnostic tools and management of trauma by conservative and surgically by laparotomy and correction of anatomy. Hence such injuries are frequently overlooked leading to increased morbidity and mortality. Thus, this study is intended to throw light upon the prompt diagnosis and management of hollow viscus injuries in trauma.

Since its inception over 30 years ago, the Advanced Trauma Life Support (ATLS) course has presented a safe approach to the initial assessment and management of the injured patient.[5]

This study is based on cases of blunt and penetrating abdominal trauma cases admitted in King Edward Memorial Hospital, Mumbai and it includes aetiological factors, various organ involvement, age-sex distribution, diagnostic modalities and management of these cases. All cases of abdominal trauma with hollow viscus injury will be classified into Five Grades according to small and large bowel injury scale from American Association for Surgery of Trauma (AAST).

Aims and Objectives

1. To study the types of injuries involved in hollow viscus injuries
2. To study nature of abdominal trauma.
3. To study prevalence of hollow viscus injury.
4. To study clinical presentation of these injuries.
5. To study investigations to detect hollow viscus injuries.

Corresponding author:* **Kalpesh Chaudhari
3/12 old air India Colony, Santacruz East, Mumbai

6. To study relation between hemodynamic stability and investigation of choice.
7. To study management (a) non-operative(b) operative
8. To study management of different hollow viscus injuries.
9. To study complications, morbidity and mortality associated with hollow viscus injuries.

MATERIALS AND METHODS

Inclusion Criteria

- All patients with significant trauma to abdomen admitted to KEM hospital who are >12 years old, with suspected / proven hollow viscus injury.
- New as well as referred cases.

Exclusion Criteria

- Patients having isolated solid organ injuries
- Patients having age less than 12 completed years.
- Patients having iatrogenic hollow viscus injury.

Type of study: Hospital based, retrospective observational study.

Sample size: All cases of abdominal trauma with hollow viscus injury falling in study duration will be included.

Source of data

Records of patients of patients of abdominal trauma admitted in KEM hospital will be reviewed from our database.

Methods of data collection

The records will be reviewed for mode of injury, date of injury, date of admission KEM hospital, diagnostic modalities used, grade of hollow viscus injury and associated injuries, morbidity (need of ICU admission, ventilator support and inotropes), treatment given, complications and final outcome. The collected data analysed with respect to the presentation by the patient, age and sex incidence, etiology, pathological features, morbidity and mortality associated with the causation and management. By analyzing the data the common etiologies of hollow viscus perforation, the most appropriate modality of investigation, treatment, and complications associated with different management modalities and possible ways to prevent them will be studied.

Statistical analysis: The data thus obtained will be analysed using appropriate tests. Fischers exact test will be used for determining statistical significance of observed data if indicated.

Study duration

December 2012 to August 2014

RESULTS

Demographical Data

Parameters	
No. of Cases	**40**
Age (yrs)	
Mean	31.65
SD	12.95
Range	18.00 – 75.00 yrs
Sex (%)	
Male	33 (82.5)
Female	07 (17.5)

As per the above data, age of cases were ranging from 18.00 – 75.00 years with average age being 31.65 years. Majority of patients were male as compared to females.

Sex Wise Distribution

82.5% of cases were male and **17.5%** of cases were female.

Gender	No. of cases (N = 40)	Percentage
Male	33	82.5
Female	07	12.5

Profile of Mode of Injury

Mode of injury	No. of cases (N = 40)	Percentage
Stab injury	04	10.0
Road Traffic Accidents (RTA)	28	70.0
Fall From Hieght (FFH)	06	15.0
Assault with blunt object	02	05.0

Above table reveals that 70.0% of the cases had RTA followed by 15.0% of the cases had FFH.

Profile of Abdomen X-ray Findings

Abdomen X-ray	No. of cases (N = 40)	Percentage
Gas Under Diaphragm	35	87.5
Normal	05	12.5

In this table, 87.5% of the cases showed air under diaphragm.

Profile of USG Fast

FAST	No. of cases (N = 40)	Percentage
Positive (presence of free fluid)	16	40.0
Negative(absence of free fluid)	06	15.0
Not done	18	45.0

As per the data, 40.0% of the cases had free fluid in abdomen and 15.0% of the cases had no free fluid. FAST was not done in 45% of all cases.

CT scan Among Study Cases

CT scan	No. of cases (N = 40)	Percentage
Splenic injury	04	10.0
Pnemoperitonium	08	20.0
Pancreatic injury	01	02.5
Liver Injury	02	05
Haemoperitonium	04	10.0
Not Done	21	50.5

According to this table, 20.0% of the cases had pnuemoperitonium followed by hemoperitonium (10%) and splenic injury(10%). CT was not done in 50.5% cases of hollow viscus perforation.

Profile of Symptoms

Symptoms	No. of cases (N = 40)	Percentage
Abdominal pain	40	100.0
Vomiting	10	025.0
Abdominal distention	07	017.5

All 40 cases under study i.e. 100.0% of the cases had symptom of pain in abdomen while 25.0% and 17.5% of the cases had Vomiting and abdominal distention respectively.

Profile of Signs among Study Cases

Sign	No. of cases (N = 40)	Percentage
Abdominal tenderness	40	100.0
Guarding	13	032.5
Rigidity	08	020.0
Absent Bowel Sounds(BSA)	10	025.0

Above table reveals that 100.0% of the cases had tenderness in abdomen as presenting symptom.

Profile of Organ Injured among Study Cases

Organ Injured	No. of cases (N = 40)	Percentage(%)
Ileal injury	19	47.5
Jejunal injury	13	32.5
Colonic injury	06	15.0
Duodenal injury	02	05.0

Above data suggests that ileum was the most commonly injured hollow organ (47%) in our study, followed by jejunum (32.5%) and colon(15%). Duodenum was the least injured organ (5%)

Profile of Operative Procedures Done

Operative procedure	No. of cases (N = 40)	Percentage(%)
Primary closure (PC)	29	72.5
Resection anastomosis (RA)	11	27.5

Profile of Complications

Complications	No. of cases (N = 40)	Percentage(%)
Wound infections	08	20
Bronchopnuemonia	04	10
Anastomatic leak	03	7.5
Sepsis	01	0.25
No complications	24	60

This data suggests that wound infection(20%) was the most common complication among study cases, followed by bronchopnuemonia, anastomatic leak and sepsis however 24 cases(60%) did not manifest into any complications.

Profile of Outcome

Outcome	No. of cases (N = 40)	Percentage
Discharge	37	92.5
Death	03	07.5

This data suggests that 92.5% of the cases were discharged only 3 patients expired post operatively.

Association between modes of Injury and outcome

Mode of Injury	Outcome			
	Death		Discharge	
	No	%	No	%
Stab injury (N = 04)	-	-	04	100.0
Road traffic accidents (RTA) (N = 28)	01	03.6	27	96.4
Fall from height (FFH) (N = 06)	02	33.3	06	66.7
Assault with blunt object (N = 02)	-	-	02	100.0

By Chi square test
P > 0.05, Not Significant

According to above table, 100.0% of the cases each had Stab and Assault which was more as compared to 96.4% and 66.7% of the cases who had RTA and FFH respectively but the difference was not significant.

Association between Complications And outcome

Complications	Outcome			
	Death		Discharge	
	No	%	No	%
Wound infection (N = 08)	-	-	08	100.0
Bronchopnuemonia (N = 04)	-	-	04	100.0
Anastomotic Leak (N = 03)	03	100.0	•	-
Sepsis (N = 01)	-	-	01	100.0
No complications (N = 24)	-	-	28	100.0

By Chi square test
P > 0.05, Not Significant

DISCUSSION

In our study we studied following parameters in detail in cases of abdominal trauma with hollow viscus injury.

Age

All patients above age of 12 years were considered in the study. The youngest and the oldest members were 18 and 75 years old respectively. Mean age of presentation being 31.65 years.

Sex

In our study, amongst 40 patients 33 were male and 7 were female forming 82.5% and 17.5% respectively of all the cases. In our study male to female ratio was found to be 4.9:1.

Mode of Injury- Most common cause of hollow viscus injury is road traffic accident (RTA) (70%). Mohapatra *et al*[6] also reported 62% cases of blunt injury abdomen were due to RTA. A study by A. Karamercan *et al* (10) showed that underlying cause was traffic accident in 87.5% patients. In our study, second most common cause of hollow viscus injury was found to fall from height (FFH), causing 15% of the hollow viscus injuries. Other important causes were stab injury (10%) and assault with a blunt object (5%).

Symptoms

In present study most common presenting symptom was pain in abdomen (100%) seen in all cases of hollow viscus injury. Vomiting was the second most common symptom (25%) followed by distention of abdomen (17.5%). Specificity and sensitivity.

Signs

Out of 40 cases in our study, 40 (100%) had abdominal tenderness at the time of admission, local (or) generalized guarding was present in 13(32.5%) cases, out of 32.5% of cases, all 13 case were operated indicating guarding as an important sign. Rigidity was present in 8(20%) cases. Out of these 8 cases, all have undergone laparotomy.

Investigations

Xray abdomen erect was done in all 40 cases of our study, of which 35 patients xrays showed evidence of air under diaphragm, which forms 85.5% all recorded cases. Another

study (Mohapatra *et al*[6]) reported accuracy of x-ray to be 100% accurate in detecting Hollow viscus injuries.

In our study, FAST was done in 22 cases out of 40 cases. USG FAST was positive in 16(40%) cases of hollow viscus perforation and it was negative in 6 cases. FAST was not done in 18 cases.

In total, CECT abdomen and pelvis was done in 19 cases. CECT of abdomen and pelvis was done in patients who were hemodynamically normal (without shock), in situations where definitive indication for operative management was not present (ex. patients without gas under diaphragm on X ray chest), in patients where other preliminary investigations (x ray chest, FAST) failed to establish a decision to proceed with operative or conservative management and to confirm diagnosis in situations of doubt. 19 patients were subjected to CT scan, out of which 4 patients had findings of splenic injury, 2 patients had liver injury and one patient had pancreatic injury. Eight patients showed pneumoperitoneum on CT. Four patient had hemoperitonium, of which two of showed sigmoid perforation and others showed transverse colon and ileal perforation.

Organs Injured

Small bowel was the most commonly involved organ in our study. (80%). Our study is comparable to a study by Khanna *et al*[7], in which small bowel was injured in 57% cases abdominal trauma with hollow viscus injury. Sigmoid colon was injured in 4 cases (10%) in our study. Duodenum was the least injured hollow viscus in our study.

Operative Procedure

In the present study primary closure of bowel perforation was done in 29 patients, resection anastomosis in 11 patients, in view of gross contamination covering ileostomy was done in 3 case of resection anastomosis also in one case of primary closure.

Large bowel injury was observed in 6(1.5%) cases, which were operated. Our study is comparable to a study by A. Karamercan *et al*[9] which colonic injury in 3 cases (2.1%) , colostomy was done in 2 cases and resection and anastomosis is done in one case.

Mortality

A total of 3 patients (7.5%) died in the present study. All patients belonged to operative group and died in the post operative period due to postoperative anostomatic leak leading to peritonitis, septicaemia and respiratory infections. Our study is comparable to a study by Cox *et al*[8]. Study reports a mortality rate of 10%.

SUMMARY & CONCLUSION

This was a retrospective study of 40 cases of abdominal trauma with hollow viscus in KEM hospital. From this study, the following conclusions can be made.

1. Males are predominantly affected. It is mostly seen in the age group of 21-30 years which form the young and reproductive group. These patients measures should be taken to prevent these accidents and care of victims at the accident site. Well established trauma care centers should be established at least at every peripheral hospital. Measures for early transport of the patients from the accident site to the trauma care centers to be undertaken.
2. A thorough and repeated clinical examination and appropriate diagnostic investigations lead to successful treatment in these patients. Though operative management remains the main stay of treatment. Plain erect x ray abdomen shows gastrointestinal injuries as gas under diaphragm, ultrasound examination gives a clear picture of HVP as free fluid and solid organ injuries. In multiple organ injuries diagnosed by CT more accurately.
3. Road traffic accident forms the most common mode of injury.
4. In case of hollow viscus injuries, jejunum and ileum are commonly involved organs. They are managed by simple primary closure. In case of breach to peritoneum were managed by laparotomy and confirm any abdominal organ injuries.
5. The most common injured viscera in the present study is small bowel (80%) of which ileum is most common and they were managed mainly by primary closure.
6. Complications like wound infection, dehiscence, respiratory inections, sepsis are managed well to reduce mortality. Post- operative infections and wound dehiscence are common in abdominal trauma.
7. The present study showed a mortality of 7.5% with compared to other studies mentioned in literature.

References

1. Committee on Trauma, American College of Surgeons: National Trauma Data Bank annual report 2009, Chicago, 2009, American College of Surgeons.
2. R. Shayn Martin and J. Wayne Meredith: Sabiston's Text book of surgery: 17th edition: vol 1: 2012: 483-531.
3. Jansen JO, Yule SR, Loudon MA, Investigation of blunt abdominal trauma, 336; BMJ 7650: 938-42.
4. Diagnosis and management of blunt small bowel injury: a survey of the membership of the American Association for the Surgery of Trauma. 2000 Mar: 48 (3): 402-7.
5. American College of Surgeons: Advanced trauma life support for doctors, ed 8, Chicago, 2008, American College of Surgeons.
6. Mohapatra S, Pattanayak SP, Rao KRRM, Bastia B. Options in the management of solid visceral injuries from blunt abdominal trauma. *Indian Journal of Surgery*. 2003; 65(3):263-8.
7. R. Khanna, S Khanna, P Singh, Puneet and A K Khanna; Spectrum of blunt abdominal trauma in Varanasi; *Quarterly J Surg Sciences*; vol 35, No 1 & 2, March & June 1999:25-28.
8. Cox, Everard F; Blunt abdominal trauma: A 5 year Analysis of 870 patients requiring Celiotomy; Ann, *Surg;* April 1984 vol 199:467-474.
9. Karamercan A, Yilmaz TU, Karamercan MA, Aytac B. Blunt abdominal trauma: evaluation of diagnostic options and surgical outcomes. *Ulus Travma Acil Cerrahi Derg*. 2008 Jul; 14(3):205-10.