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A CLINICAL STUDY TO EVALUATE AND MANAGE SOLID ORGAN INJURIES IN BLUNT ABDOMINAL TRAUMA

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ABSTRACT

A prospective study of 50 cases of blunt abdominal trauma carried out from 2010-2012 in the Dept. Of Surgery, Jehangir Hospital, Pune wherein 42 patients were put on conservative management. Specified criteria in assessment and evaluation were used and contraindications to the protocol were ruled out. In our study, the most commonly involved were males in the age group of 21-30 years and liver was the most frequently injured organ. The protocol for non-operative management was found to be simple. Even though initial imaging during evaluation was by USG, the success rates are comparable to the standard non-operative management guidelines used worldwide. The commonest mode of trauma involved road traffic accidents (RTA). Initial evaluation using physical examination, laboratory studies, abdominal x-ray, USG and CT scan were used for all patients. CT scan was the most vital imaging modality in our series. Vigilant monitoring and clinical evaluation of patients is essential in which conservative management has been begun, to prevent mortality. Surgical intervention was done where necessary.

Keywords: *Blunt Abdominal Trauma, FAST, RTA, Non-operative Management, Exploratory Laprotomy*

INTRODUCTION

Modern days have seen a great improvement in man's lifestyle and comforts, but as always, with these increased comforts, newer and more serious threats to his health have also arrived. Motor vehicle accidents now rank fourth in order among the leading causes of death. In younger people trauma is responsible for more deaths than all other illnesses. Motor vehicle accidents are the commonest cause of blunt abdominal trauma.² Blunt abdominal trauma poses a great challenge to the Surgeon. Due to inadequate treatment of the abdominal injuries, most of the cases are fatal.

India has one of the highest accident rates in the world. More than 70% of our population dwells in villages where very few trauma care centres are available. Thus, the care of abdominal injury patients is far from satisfactory. As abdominal injuries are mainly seen in young and economically productive individuals, we need to develop effective trauma care and save many innocent lives.

Pathophysiology

Understanding the mechanisms of injury is crucial in the management of a patient with abdominal trauma. Injuries can be classified as high energy or low energy. Blunt abdominal trauma causes damage from a combination of compression, shearing and bursting forces. Compression of abdominal viscera between the applied force to the abdominal wall and the posterior thoracic cage or the vertebral column can produce a crush injury. Abrupt shearing forces can cause a tear of organs or vascular pedicles. Oblique forces and deceleration injury cause shearing of viscera where anchored. Deceleration injuries occur in high speed vehicular accidents and in falls from great heights. On impact, the organs continue to move forward at the terminal velocity, tearing the organs at their sites of attachment.

Trauma Triage

Trauma triage is the use of trauma assessment for prioritizing of patients for treatment or transport according to their severity of injury.

Red	Require immediate life-saving intervention.
Yellow	Require significant intervention within two to four hours.
Green	Require intervention, but not within four hours.
Black	Dead or moribund patient.

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INITIAL RESUSCITATION AT CASUALTY: followed the standard protocol of securing adequate airway for proper breathing, establishing IV lines for fluid replacement and volume restoration, disability/neurological assessment with complete exposure of the patient. Evaluation of patient was done to identify life threatening injuries at earliest- for emergency surgery.

Investigations in a stable patient so as to detect/rule out the particular intra-abdominal injury and to decide on non-operative (conservative or interventional) or operative management for the patient.

Objectives

To find out age and sex incidence.

To evaluate various modes of clinical presentation.

To find out the frequency of various abdominal organs involved.

To evaluate various available investigations for detection of intra-peritoneal solid organ injuries.

To evaluate the role of Operative and Conservative modes of treatment.

MATERIALS AND METHODS

This study is a prospective study of 50 cases of non-penetrating abdominal injuries during the period from September 2010 to October 2012 at Jehangir Hospital & Research centre, Pune.

INCLUSION CRITERIA- All patients with blunt abdominal trauma involving solid organ injury.

EXCLUSION CRITERIA- All patients with penetrating trauma to abdomen, hollow viscus injury and severe head injury (GCS<8)

Management of Individual Organ Injuries

Liver Injuries

Non operative approach: CT criteria showed no evidence of active bleeding / expanding hematoma and blood requirement < 40ml/ kg in children and 20ml/kg in adults. Grade I to III injury

Exploratory laparotomy- hemodynamically unstable, any grade, Biliary tract trauma.

Splenic Injury

Non-operative management was done if there was non-penetrating trauma or isolated splenic injury (grades 1-2) and in alert patient (no head injury or intoxication).

PANCREAS: 3-12%

Indications for laparotomy were to control hemorrhage and bacterial contamination, debride devitalized pancreatic tissue and preserve at least 20-50% of functional pancreatic tissue. Also to provide adequate internal or external drainage of pancreatic injuries.

Kidneys

For minor injuries: (85%) Type I, II, Contusion, Laceration, conservative management was planned whereas for major injuries: (15%) Type III, IV Rupture Shattered kidney, Pedicle injury, surgical management was planned.

Methods of Collection of Data

Data were collected from the patients after initial resuscitation by clinical history, clinical examination, and initial resuscitation Routine blood and urine tests. Documentation of patient by identification, history, clinical findings, diagnostic tests, and operative findings, operative procedures, complications during the stay in the hospital and during subsequent follow-up period, were all recorded on a proforma specially prepared. Demographic data collected included the age, sex and nature and time of accident leading to the injury. Further investigations such as FAST, Ultrasound abdomen and pelvis, X-ray abdomen, CT Scan(2,3,4). Operative or non-operative management depended on the clinical examination and diagnostic tests like peritoneal lavage(5).

Implementation of Non-operative Management (NOM)

Selection Criteria

Those patients who were hemodynamically stable, showed absence of peritoneal irritation, were awake, alert & responding were selected. Following imaging, injury to single organ confirmed & viscus injury ruled out, also coagulation defects were ruled out.

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Protocol

All patients were kept in the Intensive Care Unit (ICU) with strict bed rest. The routine management followed was nil orally,(NGT) aspiration, intravenous fluids , blood transfusion as and when necessary, broad spectrum antibiotics. Daily monitoring of Vital signs 1 Hourly, Abdominal girth 1hourly, Haematocrit 12hourly, USG abdomen daily was strictly followed.

Interventional Technique in Blunt Abdominal Trauma

The non-operative technique followed was either percutaneous technique or Angiography and embolization.

Patients were taken up for operative intervention if they showed hemodynamic instability, peritoneal irritation.,e/o: hollow viscus injury, severe solid viscus injury or failure of non-operative management.

RESULTS AND DISCUSSION

Observations and Results

Table 1: Age incidence

AGE GROUP(yrs)	NO. OF PATIENTS	% OF PATIENTS
0-10	4	8%
11-20	7	14%
21-30	24	48%
31-40	8	16%
41-50	5	10%
51-60	2	4%
TOTAL	50	100%

Table 2: Outcome of mode of injury P value = 0.77073

MODE OF INJURY	OUTCOME		
	OPERATIVE	CONSERVATIVE	TOTAL
RTA	6	26	32
FFH	1	7	8
MISC	1	9	10
TOTAL	8	42	50

Table 3: GCS in emergency department

GCS	NO. OF PATIENTS	% OF PATIENTS
8-11 (MODERATE)	7	14%
12-15 (MILD)	43	86%
TOTAL	50	100%

Table 4: Organ -wise injury

Organ injured	No. of patients	% of patients
Spleen	15	30%
Liver	25	50%
Kidney	8	16%
Pancreas	2	4%
Total	50	100%

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Table 5: AAST severity grade of organ injury

AAST organ injury grade	No. of patients	% of patients
Grade i	9	18%
Grade ii	17	34%
Grade iii	16	32%
Grade iv	6	12%
Grade v	2	4%
Total	50	100%

Table 6: Outcome of AAST organ injury grade

Grade	Outcome Operative	Conservative	Total
< III	1	25	26
>III	7	17	24
Total	8	42	50

Table 7: Operative to conservative management

Management	no. of patients	% of patients
Operative	8	16%
Conservative	42	84%
Total	50	100%

Conclusion

This was a prospective study of 50 cases of blunt abdominal trauma carried out from 2010-2012 wherein 42 patients were put on conservative management. Specified criteria in assessment and evaluation were used and contraindications to the protocol were ruled out. In our study, the most commonly involved were males in the age group of 21-30 years and liver was the most frequently injured organ. The protocol for non-operative management was found to be simple. Even though initial imaging during evaluation was by USG, the success rates are comparable to the standard non-operative management guidelines used worldwide.

The commonest mode of trauma involved road traffic accidents (RTA). Initial evaluation using physical examination, laboratory studies, abdominal x-ray, USG and CT scan were used for all patients. CT scan was the most vital imaging modality in our series. Repeat evaluation involved use of physical examination, laboratory studies, USG and CT scan for all patients. In our study, we have managed patients of conservative management in the ICU as is the protocol followed worldwide. 76% of the patients in our study had uneventful recovery while the commonest complication seen was the occurrence of pleural effusion and paralytic ileus followed by wound infection. Average hospital stay of patients in our series was 8.78 days for patients managed conservatively and 16.62 days for patients managed operatively.

Successful non-operative management depends on careful selection of cases, thorough clinical examination and appropriate intensive investigation to identify cases needing laprotomy on admission. Vigilant monitoring and repeated clinical evaluation of patients in whom conservative management has been begun, to identify at the earliest early complications. Careful follow-up for a prolonged period to prevent late complications.

For managing patients conservatively, a well-equipped ICU and CT scan is a necessity. In our study, patients with hemodynamic instability and peritoneal signs were subjected to primary operative management with predictors- Systolic B.P <100 mmHg, GCS below 11, Blood transfusions more than 3 units, higher organ grade injury (>III) and age >40yrs.

Thus, all patients with injuries to solid organs of abdomen who are hemodynamically stable should be considered for conservative management after their injuries have been evaluated. These patients must be

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kept under vigilant monitoring with repeated evaluation to recognise failure of regime for early intervention.

Where facilities are available, selected cases may be managed with non-operative interventional techniques using interventional radiology. More cases will be treated without operative management with development of newer techniques to more accurately image the injury to viscera; however there is no substitute for a good history.

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