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ORIGINAL ARTICLE

A RETROSPECTIVE STUDY OF BLUNT TRAUMA ABDOMEN

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ABSTRACT: BACKGROUND: Blunt abdominal trauma is one of the important components of poly-trauma. It requires suspicion, investigation and proper management in time, to avoid morbidity & mortality. **AIM:** The aim of this retrospective study spanning 5 years w.e.f. Jan, 2010 to December, 2014 in this tertiary care institute of Geetanjali Medical College & Hospital, Udaipur was to find out BTA patients in RTA, fall from height, and assault like injuries. We studied type of injuries, male-female ratio, age group, urban & rural population involvement & their operative & non-operative management. **MATERIAL & METHODS:** The study is based on 273 cases of BTA; managed in this institute from admission, investigation, management & possible follow up. Observations are depicted in different tables. **RESULT:** Liver is most commonly involved organ followed by spleen, kidney & pancreas respectively. Initially solid organ injuries cases where treated by surgery, but than non-operative management are tried in haemostatically stable patients. Hollow visceral injuries were always managed by laparotomy & repair or resection as and when needed. Mortality occurred in 35 patients out 273 patients because of delay to reach hospital or septicemia, renal failure and shock due to multi organ failure. **CONCLUSION:** Close supervision with sophisticated infrastructure and quick action significantly reduces mortality.

KEYWORDS: Blunt trauma abdominal, Non-operative management, Road traffic accident.

INTRODUCTION: Blunt Trauma Abdomen (BTA) is a common surgical emergency which may present as an isolated problem or as a part of poly trauma.

A retrospective study of patients managed for BTA between Jan. 2010 to Dec. 2014 involving different abdominal organs was conducted in Geetanjali Medical College & Hospital, Udaipur.

This institute is located on National Highway no.-8 and caters most of the patients involved in RTA. The vehicles mostly are motorcycles, fast moving traffic with burdening transport, road conditions, ignoring safety measure and increasing alcohol abuse. Apart from RTA, fall from height, assaults and industrial accidents in this marble rich industrial zone contribute of significantly.(1)

BTA is the third most common form of injury in RTA after orthopedic injuries and head injuries and the victims mostly are young, productive adults and hence has got enormous socioeconomic impact.(2) Blunt injuries are thought to result from a combination of crushing, deforming, stretching and shearing forces. The magnitude of these forces directly related to the rate of their acceleration and deceleration also their relative direction of impact.(3)

Abdominal injuries can be particularly dangerous, because it is often difficult to assess intra-abdominal pathology in poly trauma victims. Delay in management of BTA increases morbidity and mortality due to bleeding from solid organ or vascular injury.(4)

MATERIAL & METHODS: Patient attending department of emergency with suspicion of BTA was always attended by senior consultant surgeon as we have round the clock senior surgeon on duty.

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A thorough history and clinical examination of abdomen was done. On positive finding or suspicion of abdominal injury patient was thoroughly investigated viz. blood examination like CBC, haematocrit, blood sugar, urea, creatinine., complete urine examination, x-ray chest , flat plate abdomen in supine and standing position whenever possible and U.S.G. of whole abdomen were routinely done. NCCT and CECT were done as and when required along with serial examination if needed.

Case history, mode of injury, type of vehicle involved, time of trauma to arrival at hospital, resuscitation, investigation & type of management studied in 273 cases admitted in this hospital from Jan. 2010 to Dec. 2014. The typical patients often showed with initial shock with abdominal pain, tenderness and with signs of concealed hemorrhage or peritonitis.

Abdominal pain the most common symptoms is enough to warrant close observation and frequent re-examination. Patients with deep abrasions, bruises on the abdominal in specific regions viz. right upper quadrant, left upper quadrant, loin etc. warranted proper evaluation.

OBSERVATIONS: The size of this study of 273 cases of BTA between Jan, 2010 to Dec, 2014 admitted and managed in the department of surgery, GMCH Udaipur. Udaipur region is unique in its population distribution, 30-40% rural population is tribal. Most of the cases (73%) in this series were of rural background as seen in other studies also.[5] Among the solid organs liver (26.37%) was most commonly involved organ followed by spleen (13.91%). In motor vehicle accident, seatbelt restraint usually leads to a sudden elevation in intra-abdominal pressure producing hollow visceral injury. Hollow visceral injuries occurred mainly at junction of mobile & fixed portion e.g. first part of jejunum, distal portion of ileum (18.68%), beginning of sigmoid & ascending colon (5.86%) and mesentery (4.02%). In our study diaphragmatic injury was significant (2.93%).

Age Group	Male	Female	Total
0-10	4	1	5
11-30	80	16	96
30-50	97	27	124
>50	40	8	48
Total	**22**	**52**	**273**

Sex & Age wise distribution

Male: Female 4.2:1

Rural	73%	197
Urban	27%	76

Rural / Urban distribution

Vehicle Accidents	185	68
Fall from Height	44	16
Strike by Heavy Object (Industrial)	33	12
Assault	11	4
Total	**273**	**100**

Cause of Blunt Abdominal Trauma

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Organ	Number of Cases	%
Liver	72	26.37
Small Intestine	51	18.68
Spleen	38	13.91
Large Intestine	16	5.86
Mesentery	11	4.02
Kidney	33	12.06
Retroperitoneal Hematoma	35	12.82
Diaphragm	8	2.93
Urinary Bladder	6	2.19
Pancreas	3	1.09
Total	**273**	**99.93**

Organs Involvement in B.T.A

Organ	Total No. of Cases	Surgery	Conservative
Liver	72	7	65
Spleen	38	21	17
Kidney	33	-	33
Pancreas	3	-	03
Retro Peritoneal	35	-	35
Hollow Viscera	78	78	-
Diaphragm	08	08	-
Urinary Bladder	06	06	-

Treatment Offered

Shock	6
Septicemia	10
Renal Failure	5
Cardio Respiratory Failure	14
Total	**35**

Cause of Death

DISCUSSION: With increase in urbanization and industrialization injuries of various types are increasing day by day including BTA, which required not only urgent treatment, but also different types of approach, dedication, planning and timely team work to have an effective outcome of a golden hour.[6] The initial hours of BTA are extremely crucial for the patient. Early institution of proper management results in decreased morbidity and mortality.

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Whereas delay leads to poor outcome.[7] Introduction of ambulance services No. 108 has given very positive result by early transportation of injured patient.

A rough estimate indicates that 15% of all hospitals and clinical beds are occupied by the patients of trauma as one of the single leading cause of hospital admission.[8]

The predominant symptoms and signs depends on the organ involved and also the age , general condition of the patient ,and time interval between time of injury and arrival in hospital. Most of the patient had abrasions on right or left flank and abdominal wall. Patient had marked tenderness over the region involved, abdominal distension with guarding and rigidity as well. The chief cause of BTA in this study was RTA similar to Tripathi.[9] and Jolley 1993.[10] next common was fall from height.

Socioeconomic impact of BTA is disproportionately largely due to its epidemiological characteristics. Most of study showed young previously healthy and economically productive population is usually victim of BTA.[11] In our study 73.2% cases were in age group of 11 to 50 years. Similar incidence recorded by Tripathi et al 77.1%.[9] & Davis JJ et al 75%.[12] In this study male than female 4.2:1, probably due to an active outdoor life, fast driving vehicle, aggressive behavior & may be under influence of alcohol. It is also similar to other studies by Davis et al.[12] Sule et al.[13] It may be because of easy availability of vehicles, daily migration to urban area for livelihood, unaccustomed to traffic, traffic sense and ignorance of safety measure.[14]

Liver and spleen are the two most common organs that are injured followed by small intestine, kidney, stomach, gall bladder, urinary bladder & pancreas in this order. In this series it was noticed that solid organs liver (26.37%) is most common organ involved followed by spleen (10.68%). Other solid organs involved were less in numbers. The advent of newer imaging techniques with high resolution CT scanners has enabled the clinician to exactly diagnose extends of intra-abdominal organ injuries. Lacerations are the most common form of hepatic injury identified on CT, while contusions and subcapsular hematomas are the least common.[15]

Hepatic injury occurs in 5% of patients sustaining blunt abdominal trauma.[16] The large size of the liver, its friable parenchyma, its thin capsule and its relatively fixed position in relation to the spine make the liver particularly prone to blunt injury. As a result of its larger size and proximity to the ribs, the right lobe is injured more commonly than the left. However, surgical literature confirms that as many as 86% of liver injuries have stopped bleeding by the time surgical exploration is performed.[17]Those patients with stable blood pressure, adequate urine output, maintained abdominal girth and insignificant changes in laboratory finding were managed conservatively (NOM).

With the publication of many reports of success during the last 20 years, NOM has become an established and accepted management protocol for solid organ injuries in haemodynamically stable patient.[18] High rate of operative complications caused paradigm shift from operative to non-operative management (NOM) in haemodynamically stable patient.[4] Liver due to its firm texture is more confidently treated by NOM. Haemodynamically unstable patients with frank sign of exsanguinations underwent urgent laparotomy.[19]

NOM has a significant decrease in length of hospital stay and morbidity compared to the patient who undergoes surgery. Admission to ICU & its related problems, delay in diagnosis and management of missed bowel and vascular injuries are few of the risk involved in NOM.[20]

In the non-operative managed group renal injury was the commonest injury, followed by hepatic and splenic injuries (Table-5). Velmahos G C et al.[21] manage approx.85% patients non-operatively with 8-38 %failure rate in spleen injury, but in our study conversion was 0 % out of 17 [44.74%]. According to the CT grading of splenic injuries grade IV and V injuries are treated by

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laparotomy, while lower grade injuries are managed conservatively. Splenic salvage rate improved from 67.9% to 72.4 % with this protocol and failure of NOM following the introduction of this protocol is minimal.[22]

Urological injury was found of kidney (12.06%) and urinary bladder 2.19%. Retroperitoneal hematoma was found in large number 35(12.82%). In our study all the patients [33] of renal injuries were haemodynamically stable after resuscitation were considered candidate for conservative management. It consisted of bed rest, analgesia hydration and broad spectrum antibiotics.

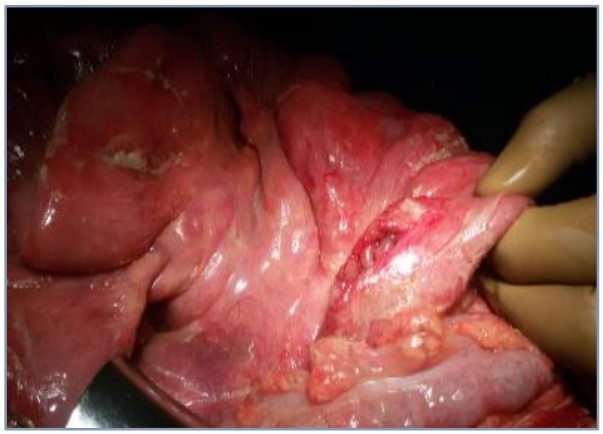

Fig. 1: Traumatic Perforation of The Terminal ileum

Injury of hollow viscera e.g. stomach, small intestine are uncommon because of their mobility. In BTA, bowel is usually injured at junction of mobile and fixed portion e.g. first part of jejunum, distal portion of ileum beginning of sigmoid and ascending colon.

Most of the perforation following BTA occurs at anti – mesenteric border of the GUT as its lacks any support. All the cases of hollow visceral injury were managed by exploratory laparotomy, repair, resection & anastomosis, and ileostome/colostomy was done as per requirement.[23] Among hollow viscera, small intestine is affected more 18.68% at its fixed point and large intestine was involved in 5.86%. Mesentery tear alone was found in 11 cases (4.02%).

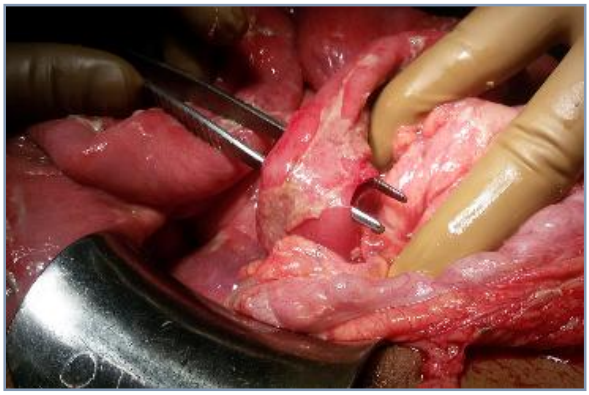

Fig. 2: Traumatic Counter –Coupe Injury of the Jejunum near D. J. Junction

In our study diaphragmatic injury (Rupture) was significant 8 cases (2.93%) in number. The incidence of diaphragmatic had been reported ranging from 1 to 7% of patients with BTA. In our study all patients had injury on left side. Numerous studies have shown a greater incidence of left sided diaphragmatic injuries. It is due to location of the lumbocoastal trigone on left side and protective effect of liver on right side. Management of such injuries was done by abdominal approach by repair with non-absorbable sutures.[24]

Patient may collapse or die without any visible injury following BTA due to vasovagal inhibition through plexuses present in posterior wall of upper abdomen. The overall mortality was 12.82% in present series which is slightly higher than other studies from India between 6 to 9%.

SUMMARY: The conclusion drawn from this study is peak incidence of BTA occur in young & productive age population with male predominance. RTA was the commonest mode of injury. Liver was the commonest organ involved followed by spleen & hollow viscera. It concluded that patient with BTA should have early and accurate diagnosis and proper regular, prompt & thoughtful management to improve overall prognosis.

It may be added that better roads, proper traffic sense and adherence to traffic rules may reduce the chance of RTA & therefore BTA. For a traumatic victim, it is not the life but the quality of function that matters.[16]

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