Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.comdoi: 10.21276/jamdsrIndian Citation Index (ICI) Index Copernicus value = 91.86

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Operative and non- operative management of liver injury

Dinesh Maheshwari[1], Avinash Maheshwari[2], Anjali Maheshwari[3], Kopal Agarwal[4]

[1]M S Surgery, (P S),Chotta Dungra ,CHC, Banswara, Rajasthan, India;
[2]M S Surgery Pass in July 2021 from SMS Medical College Jaipur, Rajasthan, India;
[3]MS Opthalmology Final year Student from Command Hospital Indian Air force Bangalore, Karnataka, India;
[4]M D Skin and V D, B J Medical College, Pune, Maharashtra, India

ABSTRACT:
Background: Liver trauma is the second most frequent event during an abdominal trauma and is the leading cause of death. The present study assessed liver trauma in adult population. **Materials & Methods:** 86 cases of liver trauma of both genderswere enrolled. The aetiology of trauma, site of injury and grade of liver injury was recorded. Associated extra-abdominal injuries was also recorded. Patients were given non-operative (group I) and operative (surgical) (group II) management. **Results:** Out of 86 patients, males were 50 and females were 36. Right side was 34 in group I and 32 in group II, left seen in 5 in group I and 9 in group II and bilateral4 in group I and 2 in group II. Mechanism of injury was RTA in 25 and 24, fall in 12 and 11, penetration4 and 5 and striking hard objects was seen in 2 and 3. Grade of liver injury was I seen in 22 and 3, II in 14 and 2, III in 5 and 10, IV in 1 and 23 and V in 1 and 5 in group I and II respectively. Associated injuries recorded were brain edema seen in 1 in each group, extradural hematoma2 in group I and 1 in group II, hemothorax in 1 in each group, pneumothoraxin group I and 2 in group II, fracture ribs2 in group I and 1 in group II, lung contusion3 in group I and 1 in group II, fracture femur1 in group I and 3 in group II, fracture pelvis2 in group I and 1 in group II and fracture tibia 1 in each group. The difference was significant (P< 0.05). **Conclusion:** Liver injuries were managed with operative and non-operative management. There were more associated injuries with non- operative group.
Key words: Liver injuries, penetrating injury, hemothorax

Received: 18 November, 2021 Accepted: 22 December, 2021

Corresponding author: Dinesh Maheshwari, M S Surgery, (P S),Chotta Dungra ,CHC, Banswara, Rajasthan, India

This article may be cited as: Maheshwari D, Maheshwari A, Maheshwari A, Agarwal K. Operative and non- operative management of liver injury. J Adv Med Dent Scie Res 2022;10(1):55-58.

INTRODUCTION

The liver is the largest intra-abdominal solid organ and is enclosed anteriorly and laterally by the rib cage. 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.[1] The right lobe is injured more commonly than the left, as a result of its larger size and proximity to the ribs. Liver trauma is the second most frequent event during an abdominal trauma and is the leading cause of death (20–40 %) in these cases.[2]

There is a paradigm shift in the management of liver trauma due to advancements of diagnostic and therapeutic modalities. About a century ago, Pringle conducted an animal experiment, occluding the porta hepatis in liver trauma while repairing the injuries. However, application of the same principle in trauma victims led to high mortality. Since 1965, the introduction of diagnostic peritoneal lavage (DPL) has led to many nontherapeutic laparotomies in previously unsuspected low-grade injuries.[3]

Many injuries that would have been treated operatively a few decades ago are now managed with methods such as angioembolization, serial CT scans, ICU monitoring, endoscopic retrograde cholangiopancreatography (ERCP), and laparoscopic evacuation of retained bile/hematoma.[4] While the highest grade injuries may still need operative intervention, many of these are given a trial of watchful waiting if the patient is hemodynamically stable.[5] The present study assessed liver trauma in adult population.

MATERIALS & METHODS

The present study comprised of 86 cases of liver trauma of both genders. All were enrolled with their written consent.

Data such as name, age, gender etc. was recorded. Patients were assessed carefully. The aetiology of trauma, site of injury and grade of liver injury was recorded. Associated extra-abdominal injuries was also recorded. Patients were given non-operative (group I) and operative (surgical) (group II) management. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 86		
Gender	**Male**	**Female**
Number	50	36

Table I shows that out of 86 patients, males were 50 and females were 36.

Table II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Site	Right	34	32	0.05
	Left	5	9	
	Bilateral	4	2	
Mechanism of injury	RTA	25	24	0.02
	Fall	12	11	
	Penetration	4	5	
	striking hard objects	2	3	
Grade	I	22	3	0.01
	II	14	2	
	III	5	10	
	IV	1	23	
	V	1	5	

Table II, graph I shows that right side was 34 in group I and 32 in group II, left seen in 5 in group I and 9 in group II and bilateral4in group I and 2in group II. Mechanism of injury was RTA in 25 and 24, fall in 12 and 11, penetration4 and 5 and striking hard objects was seen in 2 and 3. Grade of liver injury was I seen in 22 and 3, II in 14 and 2, III in 5 and 10, IV in 1 and 23 and V in 1 and 5in group I and II respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters

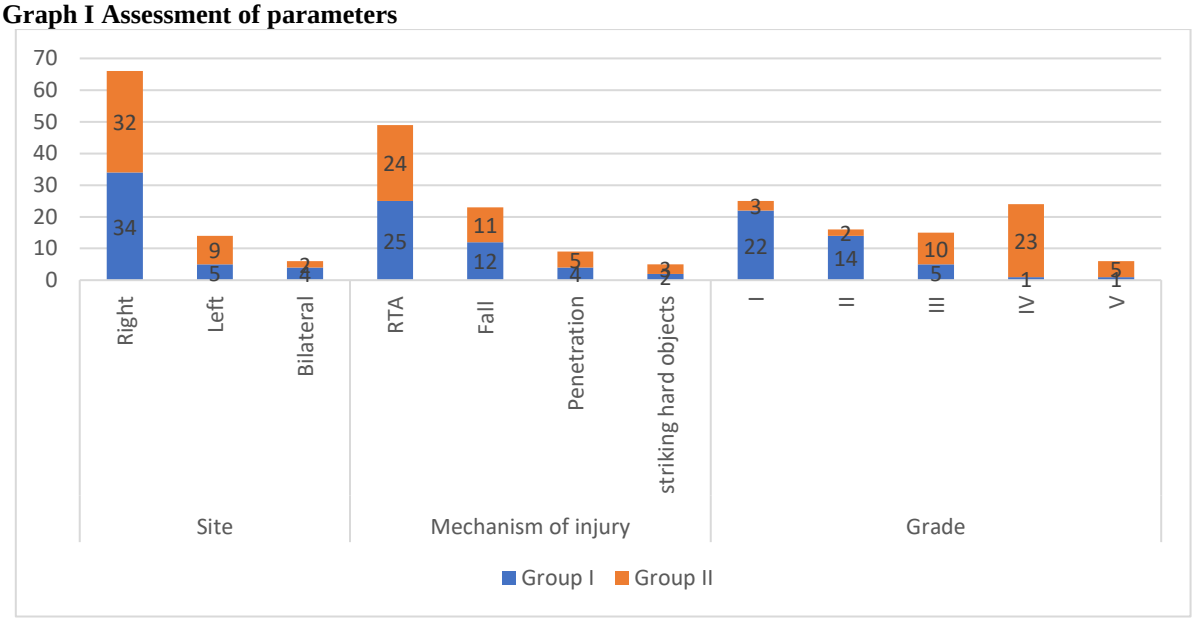


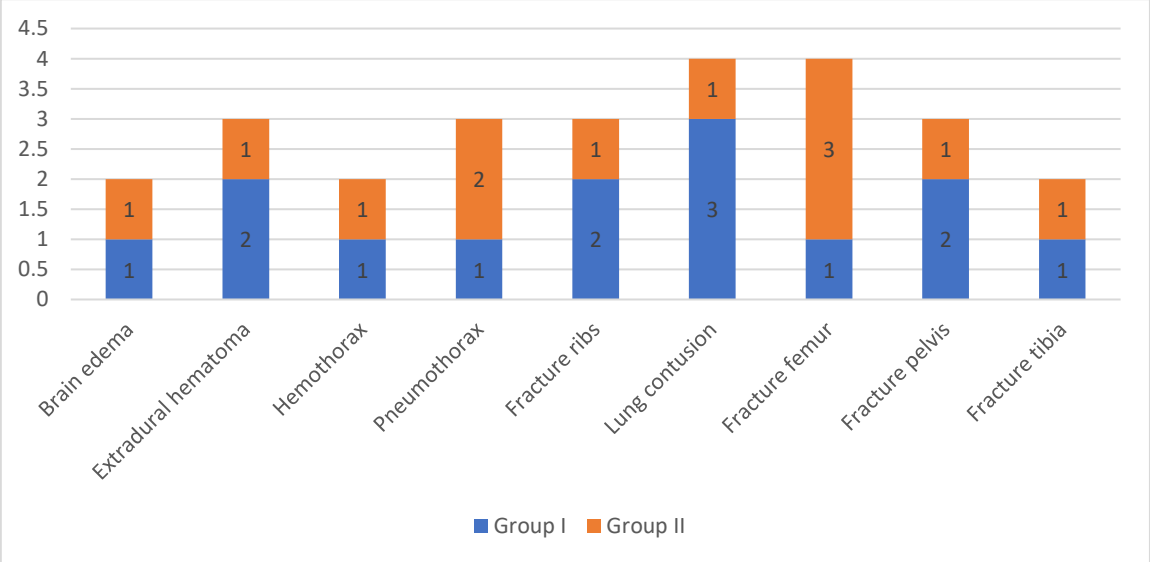
Table III Associated extra-abdominal injuries

Associated injury	Group I	Group II	P value
Brain edema	1	1	0.05
Extradural hematoma	2	1	
Hemothorax	1	1	

Pneumothorax	1	2	
Fracture ribs	2	1	
Lung contusion	3	1	
Fracture femur	1	3	
Fracture pelvis	2	1	
Fracture tibia	1	1	

Table III, graph II shows that associated injuries recorded were brain edema seen in 1 in each group, extradural hematoma2 in group I and 1 in group II, hemothoraxin 1 in each group, pneumothorax in group I and 2 in group II, fracture ribs2 in group I and 1 in group II, lung contusion3in group I and 1in group II, fracture femur1in group I and 3in group II, fracture pelvis2in group I and 1in group II and fracture tibia 1 in each group. The difference was significant (P< 0.05).

Graph II Associated extra-abdominal injuries



DISCUSSION

Most liver injuries (>85 %) involve segments 6, 7, and 8 of the liver, due to simple compression against the fixed ribs, spine, or posterior abdominal wall. Also, pressure through the right hemithorax may propagate through the diaphragm, causing a contusion of the dome of the right lobe of the liver.[6] Furthermore, ligamentous attachment of the liver to the diaphragm and the posterior abdominal wall can act as sites of shear forces during deceleration injury.[7]Introduction of computed tomography (CT) scan, use of ultrasonography in trauma, availability ofangiography, enhanced critical care monitoring and damage control surgery haverevolutionized the management of liver trauma. Numerous studies have shown better outcomewith conservative management.[8,9]The present study assessed liver trauma in adult population.

In our study, out of 86 patients, males were 50 and females were 36. Right side was 34 in group I and 32 in group II, left seen in 5 in group I and 9 in group II and bilateral4 in group I and 2 in group II. Mechanism of injury was RTA in 25 and 24, fall in 12 and 11, penetration4 and 5 and striking hard objects was seen in 2 and 3. Gradeof liver injury was I seen in 22 and 3, II in 14 and 2, III in 5 and 10, IV in 1 and 23 and V in 1 and 5 in group I and II respectively. Saleh et al[11] found that males represent 80 % while females represent 20 % of the traumatized patients. The peak age for trauma found was 11–30 years. Blunt trauma is the most common cause of liver injury as it was the cause in 48 patients (80 %). Firearm injuries are the most common cause of penetrating trauma (60 %) followed by stab injuries (40 %). More than one half of our patients (34 out of 60) were treated with non-operative management (NOM) with a high success rate. The operative procedures done were suture hepatorrhaphy (20 cases), non-anatomical resection in one case, anatomical resection in one case, and damage control therapy using pads in two cases. In another two cases, nothing was done as subcapsular hematoma had resolved. Minia University Hospital is a big tertiary Hospital in Egypt at which blunt liver trauma is more common than penetrating liver trauma. We found that associated injuries recorded were brain edema seen in 1 in each group, extradural hematoma2 in group I and 1 in group II, hemothorax in 1 in each group, pneumothorax in group I and 2 in group II, fracture ribs2 in group I and 1 in group II, lung contusion3 in group I and 1 in group II, fracture femur1 in group I and 3 in group II, fracture pelvis2 in group I and 1 in group II and fracture tibia 1 in each group. Klapheke et al[12] found that there were 389 liver injuries identified (PED = 90, adult = 299); 25

per cent of adult injuries were greater than or equal to grade III, while 23 per cent of PED injuries were high-grade injuries. Each group of patients had similar rates of primary operative intervention: adult patients (18%) versus PED patients (16%). Adjunctive therapies were rarely used in the PED patients with only one patient requiring a percutaneous drain and one patient undergoing ERCP twice. Conversely, the adult patient group required eight percutaneous drains, 15 angiograms, 6 ERCPs and 14 laparoscopic abdominal washout procedures. ICU and hospital LOS were 25 per cent and 33 per cent lower in the adult population for high-grade injuries. The overall mortality rates were similar at 7 per cent (PED) and 9 per cent (adult). Liver-related mortality was 50 per cent (3/6 deaths) in the PED group with no liver-related deaths in the adult group (27 deaths). Adult patients with blunt liver injury were no more likely to sustain high grade liver injuries than PED patients. Furthermore, adult and

CONCLUSION

Authors found that liver injuries were managed with operative and non- operative management.There were more associated injuries with non- operative group.

REFERENCES

1. Shanmuganathan K, Mirvis SE, Boyd-Kranis R, et al. Non-surgical management of blunt splenic injury: Use of CT criteria to select patients for splenic arteriography and potential endovascular therapy. Radiology 2000;217:75–82.
2. Resciniti A, Fink MP, Raptopoulos V, et al. Nonoperative treatment of adult splenic trauma: Development of a computed tomographic scoring system that detects appropriate candidates for expectant management. J Trauma 1988;28:828–31.
3. Mirvis SE, Whitley NO, Gens DR. Blunt splenic trauma in adults: CT-based classification and correlation with prognosis and treatment. Radiology 1989;171:33–9.
4. Bee TK, Croce MA, Miller PR, et al. Failures of splenic nonoperative management: Is the glass half empty or half full? J Trauma 2001;50:230–6.
5. Richardson JD. Changes in the management of injuries to the liver and spleen. J Am Coll Surg 2005;200:648–69.
6. Carrillo EH, Richardson JD. The current management of hepatic trauma. Adv Surg 2001;35:39–59.
7. Castagnetti M, Houben C, Patel S, et al. Minimally invasive management of bile leaks after blunt liver trauma in children. J Ped Surg 2006;41:1539–44.
8. Asensio JA, Demetriades D, Chahwan S, et al. Approach to the management of complex hepatic injuries. J Trauma 2000;48: 66–9.
9. Wahl WL, Ahrns KS, Brandt MM, et al. The need for early angiographic embolization in blunt liver injuries. J Trauma 2002; 52:1097–101.
10. Christmas AB, Wilson AK, Manning B, et al. Selective management of blunt hepatic injuries including nonoperative management is a safe and effective strategy. Surgery 2005;138: 606–11.
11. Richardson JD, Franklin GA, Lukan JK, et al. Evolution in the management of hepatic trauma: A 25-year perspective. Ann Surg 2000;232:324–30.
12. Saleh AF, Sageer EA, Elheny A. Management of Liver Trauma in Minia University Hospital, Egypt. Indian Journal of Surgery. 2016 Dec 1;78(6):442-7.
13. Klapheke WP, Franklin GA, Foley DS, Casos SR, Harbrecht BG, Richardson JD. Blunt liver injury in children and adults: is there really a difference?. The American Surgeon. 2008 Sep;74(9):798-801.