IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 10 Ser.3 (October. 2019), PP 43-46
www.iosrjournals.org

Non Operative Management of Low and Moderate Grade (I-IV) Isolated Blunt Hepatic Trauma and Outcome – Our Experience at Gmkmch, Salem.

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Abstract:
Background and Aims: *About 5% of all trauma admissions and 30-40% with significant blunt injury abdomen are known to have different grades of liver injury. Non operative management of low and moderate grade liver injury is being preferred nowadays. The present study evaluates the experience of non operative management of liver trauma at GMKMCH, Salem.*
Materials and methods: *A prospective study of 40 patients with isolated low and moderate grade (Grade I –IV) blunt liver trauma admitted at trauma ward at GMKMCH, Salem for a period of 1 year from September 2018 – August 2019 were taken into study and their outcome were analysed.*
Observation: *Out of 40 patients with low and moderate grade blunt liver injuries, 39 patients managed conservatively recovered without surgical intervention and discharge with normal parameters and only one patient with grade IV liver injury with persistent hemodynamic instability was operated in emergency.*
Conclusion: *Non operative management may be considered as treatment of choice in patient with low and moderate grade blunt liver trauma patient without significant morbidity and mortality with adequate care and support to the patient*
Keywords: *Blunt liver trauma, low and moderate grade, non operative management.*

Date of Submission: 21-09-2019 Date of Acceptance: 10-10-2019

I. Introduction

Liver is the largest intra abdominal organ and is the second commonest organ injured in blunt abdominal trauma. Last few years has seen tremendous shift in management of isolated blunt liver trauma from operative to non operative management and significant success rate has been seen. The new radiological imaging techniques especially ultrasonography and CT scans in specific has aided in successful non operative management of blunt liver trauma.

The present study evaluates the experience of non operative management of isolated blunt low and moderate grade (grade I –IV) liver trauma at GMKMCH, Salem.

II. Aims And Objectives

- The aim of our study is to review and evaluate our experience of non operative management of isolated blunt low and moderate grade (grade I-IV) liver trauma at GMKMCH, Salem.
- To prove that non operative management is first line of treatment in isolated low and moderate grade (I-IV) liver trauma.

III. Material And Methods

Study design - prospective non randomised study
Study group – Over a period of 1 year from September 2018- August 2019 , 40 patients with low and moderate grade (I-IV) isolated blunt liver trauma admitted in trauma ward at GMKMCH, Salem were enrolled in our study.

Inclusion criteria:
- Male and female with isolated blunt liver trauma
- Age between 20 – 70 years

- Hemodynamically stable patients
- Patient giving consent for study

Exclusion criteria:
- Patients associated with other injuries like spleen,bowel,etc.,
- Patient with co morbidities
- Hemodynamically unstable patients
- Patient not willing to give consent

Study method instituted:

From September 2018 to August 2019 a study was conducted to determine the efficacy of non operative management of isolated low and moderate grade blunt liver trauma among patients admitted in trauma ward in GMKMCH, Salem.

All patients were treated as IP by the trauma care team comprising of General surgeon, surgical gastroenterologist, Radiologist, Blood bank officer and staff nurse. A detailed history of mode of trauma and injury, clinical examination, initial management, grade of liver injury radiologically was ascertained and documented. Patient with low and moderate grade isolated liver injury with hemodynamic stability were treated by non operative method. Patients were categories based on CT findings as low and moderate grades. Patient with liver injury scale grading I and II were categorised as low grade liver trauma and with injury scale grading III and IV were categorised as moderate grade liver trauma.

LIVER INJURY SCALE:		
GRADE	**INJURY DESCRIPTION**	
I	Hematoma Laceration	Subscapular <10% surface area Capsular tear <1cm parenchymal depth
II	Hematoma Laceration	Subscapular 10-50% surface area Intraparenchymal ,10cm in diameter
III	Hematoma Laceration	Subscapular 50% surface area or expanding; ruptured subscapular or parenchymal hematoma/ Intraparenchymal hematoma .10cm or expanding >3cm parenchymal depth
IV	Laceration	Parenchymal disruption involving 25-75% of hepatic lobe or >3 couninaud`s segments within single lobe
V	Laceration Vascular	Parenchymal disruption involving >75% of hepatic lobe or >3 couinaud`s segments within a single lobe Juxtahepatic venous injuries i.e., retrohepatic vena cava/central hepatic veins
VI	Vascular	Hepatic avulsion

Patients were put on nil per oral initially and were treated with adequate i.v fluids, antibiotics, analgesics, antacids and were monitored in intensive care unit for initial few days. Patient pulse rate, blood pressure, respiratory rate, saturation, urine output, abdomen girth, signs and symptoms were monitored periodically and specific measure were taken if any deterioration in any of above parameters. Blood transfusion if needed was provided. Patient were followed up till discharge and results were tabulated and analysed.

IV. Results And Discussion

Total of 40 patients with low and moderate grade isolated blunt liver trauma were included in the study. Mode of injury, demographics, grade of liver injury, amount of hemoperitoneum, number of blood products received, length of hospital stay, complications and mortality among these patients were analysed and tabulated.

Table 1: Mode of injury:

MODE OF INJURY	NO OF PATIENTS	PERCENTAGE
Road Traffic Accident	22	55%
Self Fall	11	27.5%
Fall From Height	4	10%
Assault	3	7.5%

In our study majority of patients 55% of had blunt liver trauma due to road traffic accidents, followed by self fall while driving, during walking down from steps, fall into pit etc 27.5% and fall from height 10% and assault 7.5%.

Table 2: Sex Incidence:

Female cases		Male cases	
no of cases	percentage	no of cases	percentage
16	40	24	60

In our study majority of patients were male about 60%

Table 3: Age Incidence:

Age group	No of cases	Percentage
21-30	12	30
31-40	14	35
41-50	8	20
51-60	5	12.5
61-70	1	2.5

Table 4: Grade Of Liver Injury:

Grade of liver injury	No of patients	Percentage
I	9	22.5
II	14	35
III	12	30
IV	5	12.5

Most of patients in our study were of grade II liver injury 35% followed by grade III - 30% and I – 22.5% and grade IV – 12.5%. in our study grade I and II were considered as low grade liver injuries and grade II and IV were considered as moderate grade liver injuries and followed up.

Table 5: Number Of Blood Products Received:

Grade of liver injury	No of blood products recieved
I	0 +- 1
II	0 +- 1
III	1+-1
IV	1+-1

In our study patient with low grade liver injury either needed no blood products or one unit of blood transfusion. Those with moderate grade needed atleast 1 unit of blood transfusion due to hypovolemia, low haemoglobin levels and hypotension.

Table 6: Management:

Grade of liver injury	Non operative management		Operative management	
	no of cases	percentage	no of cases	percentage
I	9	100%	Nil	--
II	14	100%	Nil	--
III	12	100%	Nil	--
IV	4	80%	1	20%

- In our study out of 40 patients, 28 patients – 70% of patients were hemodynamically stable most of them were of grade I,II and III at the time of admission and required i.v fluid and prompt observation alone and were treated conservatively.
- About 20% - 8 patients presented with mild hemodynamic instability with fall in Hb% level and required blood transfusion, iv fluids management and ICU care for stabilization and were managed without any morbidity.
- 3 patients - 7.5% presented with moderate hemodynamic instability required aggressive resuscitation with blood products, i.v fluids, colloid, ICU management and prompt observation for stabilization.
- Only 1 patient 2.5% with grade IV liver injury admitted with profound shock and hypotension was resuscitated with blood products, iv fluids, colloids and was taken up for emergency laparotomy and suturing of liver laceration done.

Table 7: Length of hospital stay:

Grade of liver injury	Length of hospital stay
I	8+-2 days
II	8+- 3 days
III	10+-4 days
IV	10+-5days

In our study the average length of stay in hospital following isolated blunt liver trauma was 10 days with conservative management. Patient who underwent laparatomy had a hospital stay of 15 days.

V. Conclusion

Non operative management is the first line of management in treatment of low and moderate grade (I-IV) isolated blunt liver trauma. In patients presenting with hemodynamic instability aggressive resuscitation followed by prompt observation may avoid the need for laparotomy in liver trauma. In patients not responding to non operative management laparotomy and controlling of hemorrhage is warranted.

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