Outcome of Management of Blunt Liver Trauma

Thesis

Submitted for partial Fulfillment of Master Degree in General Surgery

Submitted by

Mohamed Elshahat Arafaa

Ain Shams University

M.B, B.Ch

Supervisors

Prof. Dr. Khaled Zaky Mansour

Professor of General Surgery

Faculty of Medicine - Ain Shams University

Dr. Hany Rafeek Wakeem

Assistant professor of General Surgery

Faculty of Medicine - Ain shams University

Dr. Kamal Mamdouh Kamal

Lecturer of General Surgery

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

2019

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH,** *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Prof. Dr. Khaled Zaky Mansour,** *Professor of General Surgery Faculty of Medicine - Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Dr. Hany Rafeek Wakeem,** *Assistant Professor of General Surgery Faculty of Medicine - Ain shams University, for his kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I am deeply thankful to **Dr. Kamal Mamdouh Kamal,** *Lecturer of General Surgery Faculty of Medicine - Ain Shams University, for his great help, active participation and guidance.*

Mohamed Elshahat Arafaa

List of Contents

List of Tables

List of Figures

List of Figures Cont...

List of Figures Cont...

List of Abbreviations

Abb.	Full term
AAST	American Association for the Surgery of Trauma
ATLS	Advanced Trauma Life Support
BAT	Blunt abdominal trauma
CT	Computerized Tomographic
DCS	Damage Control Surgery
DPL	Diagnostic peritoneal lavage
ECG	Electrocardiogram
FAST	Focused assessment by ultrasound for trauma
FDA	Food and Drug Administration
HSG	Hemodynamic Stable Group
ICU	Intensive care unit
NOM	Non operative management
OM	Operative management

INTRODUCTION

The liver is the largest gland in the body occupying 2.5% of total body weight and providing a host of functions necessary for maintaining normal physiological homeostasis. Despite the complexity of its functions, the liver has a homogenous appearance, making hepatic anatomy a challenging topic of discussion. To address this issue, scholars have devoted time to establishing a framework for describing hepatic anatomy to aid clinicians. Work by the anatomist Sir James Cantlie provided the first accurate division between the right and left liver in 1897. The French surgeon and anatomist Claude Couinaud provided additional insight by introducing the Couinaud segments on the basis of hepatic vasculature. These fundamental studies provided a framework for medical and surgical discussions of hepatic anatomy and were essential for the advancement of modern medicine ***(Juza and Pauli, 2014).***

The liver has fixed position and large size these make it more prone for injury in blunt trauma of the abdomen followed by spleen. Liver and spleen together, account for 75% of injuries in blunt abdominal trauma. Liver is the most common cause of death following abdominal injury. The management of blunt trauma abdomen is challenging ***(Kumar et al., 2017).***

The liver is the second most commonly injured abdominal organ, despite its well-protected position, because of

its size and position which makes it prone to injury ***(Cheung et al., 2016).***

Hepatic traumatic lesions can be classified as minor (grade I, II), moderate (grade III) or major/severe (grade IV, V) injuries. This classification is not well defined in the literature, but aims to define the type of management that can be adopted and the related outcome. Frequently low-grade American Association for the Surgery of Trauma (AAST) lesions (i.e., grade I-III) are considered as minor or moderate and treated with Non Operative Management. However some patients with high- grade lesions (i.e., grade IV-V laceration with paren-chymal disruption involving more than 75 % of the hepatic lobe or more than 3 Couinaud segments within a single lobe) may be hemo-dynamically stable and treated with NOM. This demonstrates that the classification of liver injuries as minor or major ones must consider not only the anatomic AAST classification but more importantly, the hemodynamic status of the patient and the associated injuries ***(Coccolini et al., 2016).***

Non operative management of blunt hepatic trauma is now the standard of care for hemodynamically patients with reported success rates ranging from 82% to 100 %. The advantages of NOM include: lower hospital cost, earlier discharge, avoiding non-therapeutic laparotomy and their associated cost and morbidity, unnecessary liver resection, fewer intra-abdominal complications and reduced number of transfusions ***(Stassen et al., 2012).***

The initial assessment of patients with suspected blunt abdominal trauma should focus on the patient's abdominal examination, vital signs, and response to resuscitation. General principles of advanced trauma life support should be instituted, and the response to resuscitation closely monitored. Peritonitis remains an indication for exploration after blunt abdominal trauma ***(Kozar et al 2009).***

In a prospective case–control trial, reported that even higher grades of liver injury responded to NOM and that only a loss of haemodynamic stability or the development of complications determined the need for surgery ***(Asfar et al., 2014).***

Doctors should be experienced in order to closely observe the patients and prepare for emergent operation in time In the early stage, the doctors should accurately judge the severity of injury, monitor the patients' vital signs and ensure hemodynamic changes timely. Moreover, symptomatic treatment, nutritional support, and the maintenance of the patient's water and electrolyte balance are necessary to promote the healing of viscus organs, meanwhile the doctors should also pay attention to the protection of viscus function ***(Yu et al., 2016).***

Aim of the Work

The aim is to assess the safety and efficacy as well as advantage and disadvantage in management of patients with liver blunt trauma so as to put conclusion and recommendation about what results arrive in management of patients with blunt liver trauma.

Chapter 1

SURGICAL ANATOMY OF THE LIVER

Gross anatomy:

The liver is the largest gland in the body and in the adult measures roughly 1500 g, constituting 2.5% of total body weight ***(Si-Tayeb et al., 2010).***

It occupies the space inferior to the right and a portion of the left diaphragm and is enveloped by a fibrous membrane known as Glisson's capsule. The liver is also covered by visceral peritoneum anteriorly and posteriorly except for a bare area where it directly abuts the diaphragm. It is suspended from the diaphragm superiorly by the coronary ligament, which continues outward to form the right and left triangular ligaments, and anteriorly by the falciform ligament and at the porta hepatis by the gastro-hepatic, and hepato-duodenal ligaments. The hepato-duodenal ligament envelops the porta hepatis including the hepatic artery, hepatic vein and bile ducts ***(Schulick, 2006; Fig. 1)***

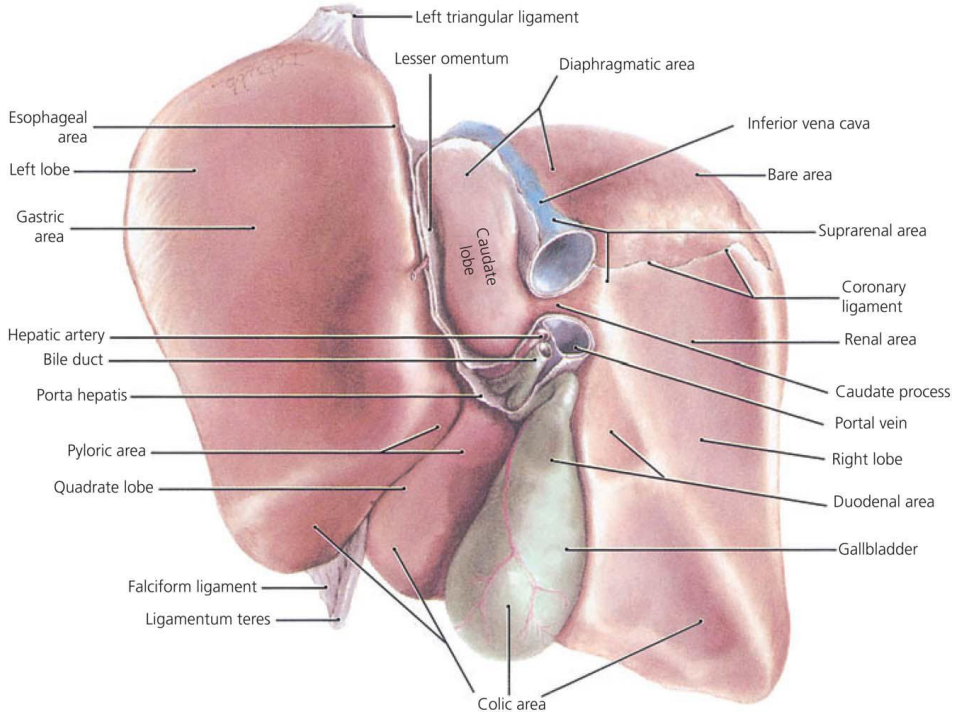

Fig. (1): Posterior view of hepatic anatomy. (Adapted with permission from Kanel G.Textbook of Gastroenterology; Liver: Anatomy, Microscopic Structure, and Cell Types. Copyright VC 1999–2013 John Wiley & Sons, Inc. All Rights Reserved). [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Surfaces of the liver:

There are three surfaces of the liver according to sagittal section. The posterior surface, antero-superioir surface and the inferior surfac ***(Mark Bloomstoon et al., 2010).***

1. The posterior surface:

Is related to the vertical part of the diaphragm and for all practical purposes, is retro peritoneal, the bare area of the liver