UP TO DATE LAPAROSCOPIC MANAGEMENT OF BLUNT ABDOMINAL TRAUMA

Essay submitted for partial fulfillment of master degree

In General Surgery

Presented by

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2013

Acknowledgment

First of all, thanks GOD, the merciful, the beneficent for helping me during this work.

Many thanks and appreciation to **Prof. Dr. Yasser Mohamed Hamza**, Professor of General Surgery, Faculty of Medicine, Alexandria university for his great discussion and encouragement and for his kindness throughout the work.

I would like to express my indebtedness and deepest gratitude to **Professor Dr. Mohamed Abd El-Rahman El-Kordy**, Prof. of General Surgery, Faculty of Medicine, Alazhar University for his valuable advice, guidance and constructive criticism, also for the invaluable assistance and efforts he devoted in the supervision of this study.

I'll never forget, how co-operative was **Prof. Dr. Mohamad Sobhy Taema**, Professor of General Surgery, Faculty of Medicine, Alazhar University, also he was encouraging all the time. It is honourable to be supervised by him.

I am thankful to all the staff and members of General Surgery Department, Faculty of Medicine, Alazhar University, for helping me to make this work.

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LIST OF ABBREVIATIONS

ACS	:	American College of Surgeons
ACTH	:	Adrenocorticotropic hormone
ADH	:	Antidiuretic hormone
AMPLE	:	Allergies, Medication, Past illnesses, Last meal, Events and environment
ATLS	:	Advanced Trauma Life Support
BAT	:	Blunt Abdominal Trauma
CBD	:	Common Bile Duct
CT	:	Computerized Tomography
DPL	:	Diagnostic Peritoneal Lavage
ED	:	Emergency Department
E-FAST	:	Extended version of FAST
ERCP	:	Endoscopic Retrograde Cholangeography
FAST	:	Focused Abdominal Sonography for Trauma
GCS	:	Glasgow Coma Scale
GE	:	Gastro-Eosophagyeal
GIA stapler	:	Gastrointestinal Anastmosis stapler
GIT	:	Gastrointestinal Tract
HALS	:	Hand-Assisted Laparoscopic Surgery
HVI	:	Hollow Viscus Injury
IAP	:	Intraabdominal Pressure
IVU	:	Intraoperative Intravenous Urogram
LLQ	:	Left Lower Quadrant
LUQ	:	Left Upper Quadrant
MIS	:	Minimally Invasive Surgery
MRI	:	Magnetic Resonance Imaging
MVC	:	Motor Vehicle Collision

OPSI	**:**	Overwhelming Postsplenectomy Infection
PS	**:**	Primary survey
RBC	**:**	Red Blood Cell
RLQ	**:**	Right Lower Quadrant
RUQ	**:**	Right Upper Quadrant
TA stapler	**:**	Thoracoabdominal
TCA	**:**	Tricarboxylic Acid
US	**:**	Ultrasonography
WBC	**:**	White Blood Cell
WHO	**:**	World Health Organization

INTRODUCTION

The incidence of abdominal trauma increases each year. Blunt Abdominal Trauma (BAT) generally leads to higher mortality rates than penetrating wounds and presents greater problems in diagnosis **(Luchett et al., 2007).**

Twenty percent of all trauma operations are performed for management of abdominal injury. Failure to recognize occult abdominal hemorrhage and to successfully control bleeding from intra abdominal organs leads to significant morbidity and such injuries account for approximately 10 % of traumatic deaths **(Hoyt et al ., 2002).**

Blunt trauma to the abdomen can cause severe injury especially to solid abdominal organs **(Hann, et al., 2005).**

The use of laparoscopy as a diagnostic tool was introduced as early as 1976 by Gazzaniga. With the development of modern technology, interest in applying laparoscopic techniques in the care of trauma patients has been renewed **(Antonio, 2003).**

Laparoscopy has been used increasingly for the diagnosis and treatment of intra-abdominal and pelvic disorders **(Uranus, 2005).**

Laparoscopy was valuable in blunt abdominal trauma, avoiding laparotomy in more than two-thirds of patients with suspected intra-abdominal injuries and can serve as a useful adjunct for the evaluation of blunt abdominal trauma as the procedure is associated with low rate of complications and missed injuries **(Chelly et al., 2003).**

Despite improved diagnostic tools such as computerized tomography (CT scan) and magnetic resonance imaging (MRI), conventional treatment of patients with abdominal trauma injures often requires exploratory laparotomy procedures to accurately diagnose and treat patients, injures. Studies show that nontherapeutic (i.e., negative) laparotomy rates range from 5% to 40%, depending on the clinical situation. Many surgeons now perform diagnostic laparoscopic procedures before or instead of exploratory laparotomy procedures in hemodynamically stable patients with abdominal trauma injuries. Although laparoscopy in patient with abdominal trauma injury does have limitations, it is an effective tool for preventing negative laparotomies and for creating minor abdominal incision **(Fabian and Croce, 2000).**

On the basic of the laparoscopic findings, laparoscopy may be enough in patients with blunt abdominal trauma for gastric wall repair, small bowel repair, small bowel resection-anastomosis, ligation of bleeders in the mesentery and omentum, sigmoid colon repair, Hartmann's procedure, cholecystectomy, distal pancreatectomy and splenectomy **(Balien, 2005).**

Patients who will undergo therapeutic laparoscopy for resolution of their abdominal trauma injures will have decreased hospital stays, less wound infection, post- operative pain, better cosmetic result and earlier ambulation **(Chol, 2003).**

The field of Minimally Invasive Surgery (MIS) is the fastest growing area of surgical innovation. Each year as new techniques and tools are developed, more patients benefit from surgical procedures previously associated with a significantly more invasive approach **(Durkin and Shaaban, 2008).**

AIM OF THE WORK

This work aims at focusing on the value of laparoscopy in the management of blunt abdominal trauma (BAT) as diagnostic and therapeutic tool.

LAPAROSCOPIC ANATOMY OF THE ABDOMEN

This chapter will provide an outline for viewing the major structures of the abdominal cavity, and will illustrate the important ones most surgeons will need to recognize during laparoscopic surgical procedures **(Milsom et al, 2006)**.

The Right Upper Quadrant (RUQ)

To best see in the RUQ, the patient should lie in the reverse Trendelenburg position with the body tilted with the right side up. First, the liver should be assessed overall for its shape, size, and surface texture (Figure 1). Also demonstrable is the under surface of the right diaphragm (Figure 2). Generally, the umbilical port is best for doing this, with instruments in the other ports used for lifting up the edge of the liver and looking underneath at the porta hepatis, and the gallbladder (Figure 3). Also visible is the hepatic flexure of the right colon with the duodenum, in thinner patients the pancreatic head, gallbladder, and the inferior aspect of the right lobe of the liver (Figure 4) **(Gray and Moshe, 1997)**.

The Left Upper Quadrant (LUQ)

By sweeping the laparoscope across the abdomen to the left side and tilting the left side of the body up, segments II and III of the liver can be easily inspected (Figure 5). The esophageal hiatus, the caudate lobe through the hepatogastric ligament, and the cardia of the stomach can be demonstrated by lifting up the left lobe with atraumatic grasper (Figure 6). Also demonstrable is the undersurface of the left hemidiaphragm, and the spleen.

The splenic flexure, the splenocolic ligament, and the omentum may be easily visualized, along with the transverse colon (Figure 7). The body of the pancreas may often be seen indenting the transverse mesocolon in the left upper quadrant (LUQ) as well **(Thiele et al, 2006)**.

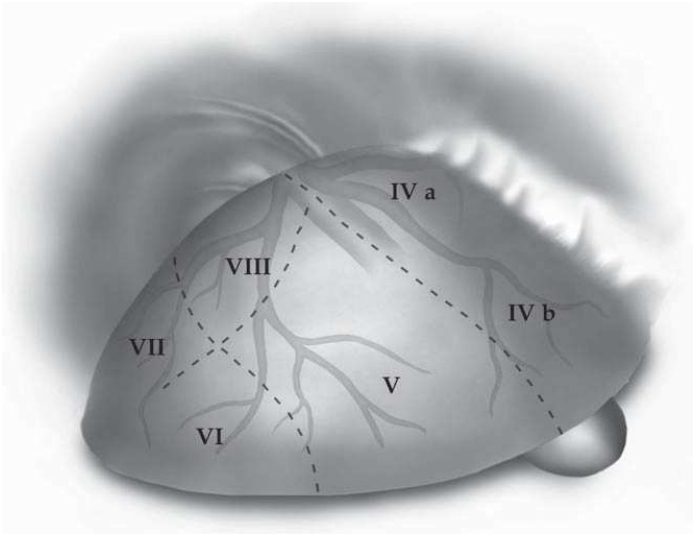

Figure (1): At the start of a laparoscopy, the liver to the right of the falciform ligament may be viewed broadly over its surface (hepatic segments of Couinaud and the hepatic veins are depicted in the drawing) *(***Gray and Moshe, 1997)**.

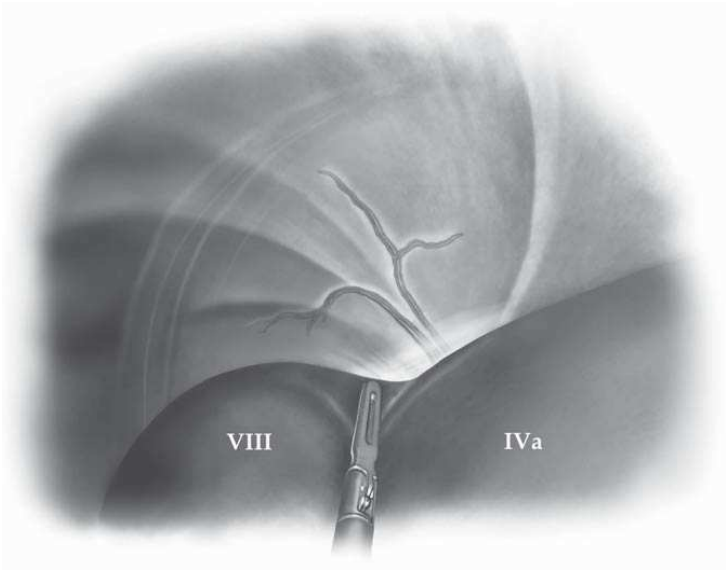

Figure (2): Peering above the right portion of the liver, the posterior portions of segments VIII and IVa and the undersurface of the right diaphragm may be seen **(Gray and Moshe, 1997)**.

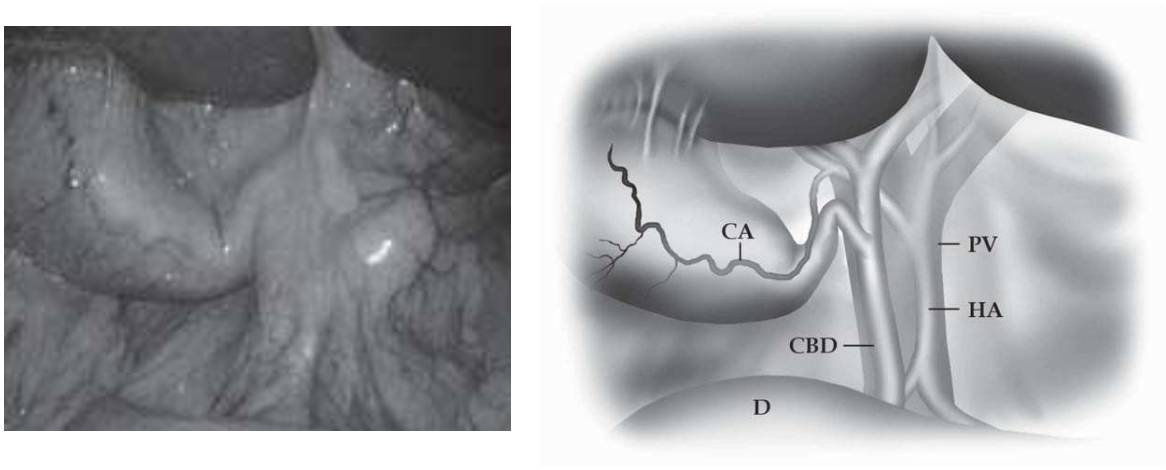

Figure (3): By lifting up the lower edge of the liver, the porta hepatic and the gallbladder may be seen. CA, cystic artery; CBD, common bile duct; D, duodenum; PV, portal vein; HA, hepatic artery **(Gray and Moshe, 1997).**

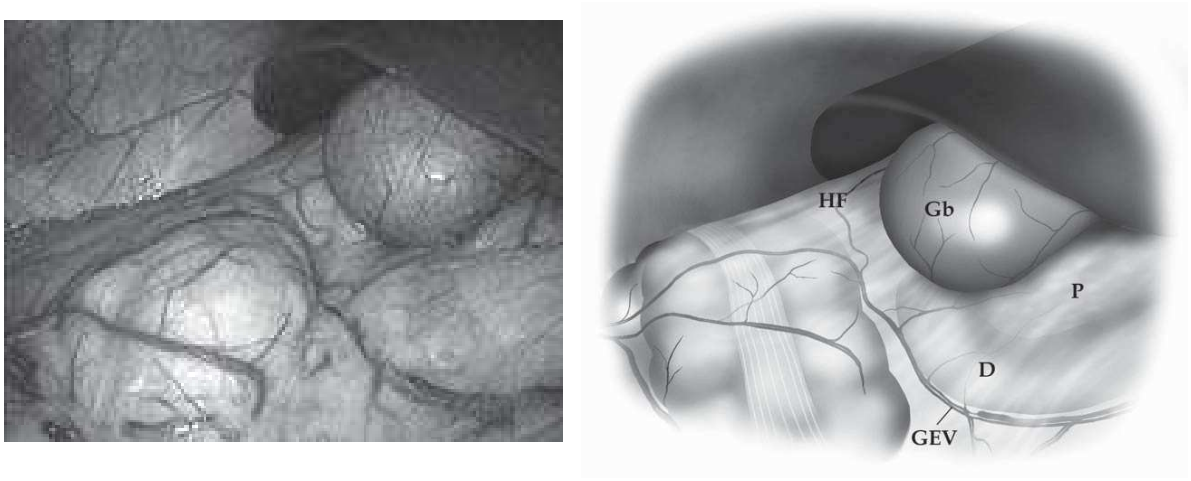

Figure (4): Just below the liver in a thin patient, the hepatic flexure, duodenum, and pancreatic head may be seen. HF, hepatic flexure; Gb, gallbladder; D, duodenum; P, pancreas; GEV, gastroepiploic vessels **(Gray and Moshe, 1997)**.