

Safe Lap. Surgery

By

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Prof. Surgery & Laparo endoscopy, Sohag .

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Big Surgeons Make Big Incisions

Philosophy of early/mid 20th century surgeons



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Advantages of laparoscopy

I. Small Wounds (minimal access)

- Less pain.*
- Less wound infection.*
- Early ambulation.*
- Less pulmonary complications.*
- Early resumption of activities.*
- Better cosmesis.*

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II. Minimal Invasion

Less exposure → less evaporation of body fluids.

Fine manipulations → less tissue damage → less bleeding and less post operative ileus.

III. Better Access and magnification

Oesophageal hiatus, pelvis and porta hepatis.

IV. Exploration

Always feasible regardless the type of operation

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Preparation for surgery

- nil orally since the morning of surgery.
- Before coming to operation theatre patient should always void urine.
- Foleys catheterization : ? Not necessary in upper abdominal surgery, lower abdominal surgery.
- Insert a nasogastric tube in upper abdominal procedures.
- shaving of skin is not a must.

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Patient position:

- **at the time of pneumoperitoneum**--- steep trendelenburg (supine with 10-20 degrees head down.)
- **very obese patient**---- in supine position.
- **In Gynaecological laparoscopic procedures**--- lithotomy position & one assistant positioned between the leg of patient.
- **In thoracoscopy or retroperitoneoscopy**: patient is placed in lateral position.

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DISADVANTAGES OF LAPAROSCOPY

I. Needs special training

Long special instruments.

Hand – Eye coordination.

II. Complicated technology →

Higher failure rates.

III Limited visual field – cameraman.

IV. Bi-dimentional picture (No depth).

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V. Absent touch and grip.

VI. Fixed port sites → fixed angles of work.

VII. Difficult control of bleeding:

Absent grip or pack. Blood on lens.

Blood absorbs light.

VIII. Blind steps

ie. veress needle and 1st trocar.

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IX. Gas insuflation under pressure to create a working space

→ anaesthetic problems.

X. Instruments are difficult to clean, maintain or sterilize

XI. More expensive


XII. Time consuming

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**Safe Laparoscopy =
Enjoy the Advantages
Avoid the Complications**

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Classic Laparoscopic Cholecystectomy- Prof. A. Redwan



Clipless Laparoscopic Cholecystectomy- Prof. A. Redwan



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Between 1997 & 2002, FDA received more than 1300 injury reports including 30 deaths

Trocar penetrates through left common iliac artery

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FDA U.S. Food and Drug Administration

Laparoscopic Trocar Injuries: A report from a U.S. Food and Drug Administration (FDA) Center for Devices and Radiological Health (CDRH) Systematic Technology Assessment of Medical Products (STAMP) Committee

John P. Miller, MD, (CAPE L1998) L, Walter Scott, PhD, (CAPE L1998) L, Brian Aiken, M.D., (CAPE L1998) L, M.D. J.

U.S. FDA, CDRH, Office of Surveillance and Biometrics, U.S. FDA, CDRH, Office of Health and Safety Programs.

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Observational study

Predictors of Major Complications after Laparoscopic Cholecystectomy: Surgeon, Hospital, or Patient?

Melissa M Murphy, MD, MPH, Ting-Chiao Ng, MD, Jessica P Simon, MD, MPH, Nicholas G Cohen, MD, David A Stolt, MD, PhD, Jennifer F Tseng, MD, MPH, PhD

J Am Coll Surg 2010;211:73-80

From the Department of Surgery, Surgical Outcomes Analysis and Research, University of Massachusetts Medical School, Worcester, MA.

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Anatomy and congenital malformation

The classic description of the extra hepatic biliary tree and its arteries applies only in about one third of patients.

Molmenti EP, Pinto PA, Klein J, et al: Normal and variant arterial supply of the liver and gallbladder. *Pediatr Transplant* 7:80, 2003. [PubMed: 12581334]
Chen TH, Shyu JF, Chen CH, et al: Variations of the cystic artery in Chinese adults. *Surg Laparosc Endosc Percutan Tech* 10:154, 2000. [PubMed: 10872977]

(Schwartz's Principles of Surgery, Ninth edition)
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MECHANISM
Factors associated with an increase in BDI

- > Anatomical abnormality of the bile ducts
- > Chronic inflammation around the gallbladder
- > Poor exposure
- > Bleeding in the surgical area

McPartland, *Surg Clin N Am* 2008
Jablonska, *World J Gastroenterol* 2009

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632 cases with post chole. Problems out of more than 3000 cases of ERCP operated for a variable indications along more than 10 years period from 2000 till 2010 (about 19% of ERCP cases seen).

(Redwan, *Surg. Laparosc. Endosc. Percutan. Tech.* 2009)

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213 cases (33.7%) with missed or recurrent stones

419 cases (66.3%) with post cholecystectomy biliary injuries

419/ ???? cases (↑↑↑ incidence)

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Only **50 cases** was operated in our center out of more than **14,500 cases** operated allover 10 years period (incidence of 0.3% equal for OC, and LC)

The incidence in upper Egypt
???????

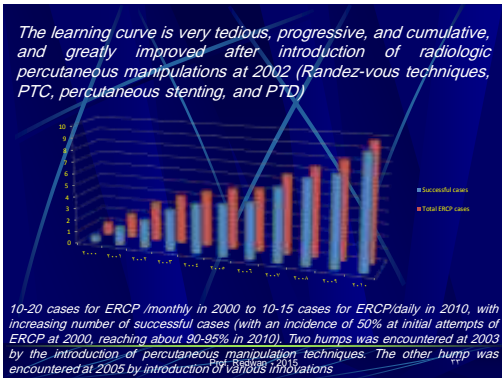
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Original Article

Endoscopic Management of Postoperative Bile Duct Injuries: A Single Center Experience

ABSTRACT

Between March 1994 and May 2008, a total of 277 patients had ERCP in Gastroenterology Center, Mansoura University for a suspected postoperative bile duct injury. The mean age was 45.3 years with a range of 15 to 68 years. One hundred sixty two were women [F/M ratio was 162 (58.5%)/115 (41.5%)]. Only 24/277 patients (8.7%) were previously operated at our center. The time interval between offending surgery and ERCP ranged between two-54 days with a mean of 20 days.



Multidisciplinary Approaches for Management of Postcholecystectomy Problems (Surgery, Endoscopy, and Percutaneous Approaches)

TOP 10 ARTICLES PUBLISHED IN THE SAME DOMAIN SINCE YOUR PUBLICATION

1. Redwan AA. Multidisciplinary approaches for management of postcholecystectomy problems (surgery, endoscopy, and percutaneous approaches). Surg Endosc. 2009;23(10):2470-4. doi:10.1007/s00464-009-0500-0.

TOP 10 ARTICLES PUBLISHED IN THE SAME DOMAIN, ALL TIME

1. Redwan AA. Multidisciplinary approaches for management of postcholecystectomy problems (surgery, endoscopy, and percutaneous approaches). Surg Endosc. 2009;23(10):2470-4. doi:10.1007/s00464-009-0500-0.

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2. Redwan AA. Multidisciplinary approaches for management of postcholecystectomy problems (surgery, endoscopy, and percutaneous approaches). Surg Endosc. 2009;23(10):2470-4. doi:10.1007/s00464-009-0500-0.

Complications of laparoscopy

I - Due to pneumo-peritoneum:

- 1- Surgical emphysema:
Subcutaneous, scrotal, pre-peritoneal, retroperitoneal, omental, mesenteric and mediastinal.
- 2- Pneumothorax:
Diaphragmatic or pleural injury
Patent pleuro-peritoneal canal.
- 3- Air Embolism
- 4- Increase venous return
→ Hypotension + D.V.T.

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- 5- Hypercarbia → arrhythmia and acidosis.
- 6- Increase diaphragmatic movements.
- 7- Spread of malignancy → port metastasis .
- 8- Spread of infection to surgeon-conjunctiva

II - Visceral injuries (0.16 – 0.27%)

*Solid organ or hollow viscous.
Complete or incomplete.*

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Etiology:

*Lack of relaxation.
Forcible introduction of trocar.
small trocar wound.
Full bladder and distended gut.
Adhesions to abdominal Wall.
Thermal injuries esp. monopolar.
Faulty techniques ie. sharp
instruments out of field.*

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Diagnosis:

*Aspiration from veress needle.
Lap. Exploration
May be missed.
Post operative Drain.*

Treatment:

*Prophylaxis.
Early recognition.
Repair (Lap. Or open).*

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NB.

*Abnormal unexplained blood
or fluid inside the peritoneum
= ?? Injury*

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BOWEL INJURIES

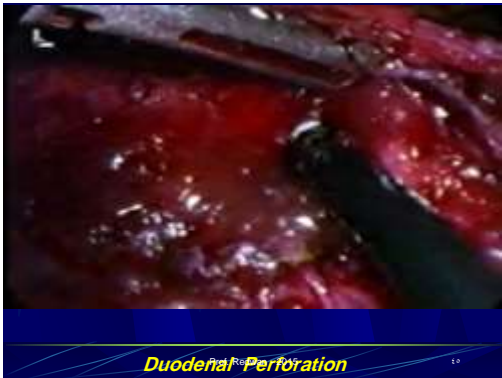
- many bowel injuries go **unrecognized** at the time of the procedure.
- patients present postoperatively, often after discharge, with **peritonitis**.
- This delay makes it a significant cause of morbidity and mortality

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Intestinal injuries







Post Chole. Biliary Injuries

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CLASSIFICATION

BISMUTH CLASSIFICATION

IS BASED ON THE MOST DISTAL LEVEL AT WHICH HEALTHY BILIARY MUCOSA IS AVAILABLE FOR ANASTOMOSIS DURING REPAIR OF BILIARY INJURY

TYPE	CRITERIA
1	Low common hepatic duct stricture with a length of common hepatic duct stump of > 2 cm
2	Proximal common hepatic duct stricture with hepatic duct stump < 2 cm
3	Hilar stricture, no residual common hepatic duct, but the hepatic ductal confluence is preserved
4	Hilar stricture with involvement of confluence and loss of communication between right and left hepatic duct
5	Involvement of an aberrant right sectorial duct alone or with concomitant stricture of the common hepatic duct

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STRASBERG CLASSIFICATION

STRATIFIES INJURIES FROM TYPE "A" TO "E", WITH TYPE "E" INJURIES BEING FURTHER SUBDIVIDED INTO E1 THROUGH E5 ACCORDING TO THE BISMUTH CLASSIFICATION SYSTEM

TYPE	CRITERIA
A	Cystic duct leak or leak from small ducts in the liver bed
B	Occlusion of an aberrant right hepatic duct
C	Transection without ligation of an aberrant right hepatic duct
D	Lateral injury to a major bile duct
E1	Transection > 2 cm from the hilum
E2	Transection < 2 cm from the hilum
E3	Transection in the hilum
E4	Separation of major ducts in the hilum
E5	Type C injury plus injury in the hilum

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STEWART-WAY CLASSIFICATION

IS BASED PRIMARILY ON THE ANATOMIC PATTERN AND MECHANISM OF A PARTICULAR INJURY, INCLUDING THE PRESENCE OF ASSOCIATED VASCULAR INJURY

Class	Criteria
I	CHD mistaken for cystic duct, but recognized. Cholangiogram incision in cystic duct extend.
II	Bleeding, poor visibility. Multiple clips placed on CHD/CHD.
III	CHD mistaken for cystic duct, not recognized. CHD, CHA or right or left hepatic ducts transected and/or removed.
IV	Right hepatic duct (or right sectorial duct) mistaken for cystic duct. Right hepatic artery mistaken for cystic artery. Right hepatic duct (or right sectorial duct) and right hepatic artery transected.

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