LAPAROSCOPIC SURGERY

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SHORT HISTORY

- 1982. Semm performed first Laparoscopic Appendicectomy.
- 1987 Mouret performed first Laparoscopic Cholecystectomy.
- 1992 First UK Laparoscopic Training centre established.

LAPAROSCOPIC SURGERY

"KEYHOLE SURGERY"

MINIMALLY INVASIVE SURGERY

MINIMAL ACCESS SURGERY

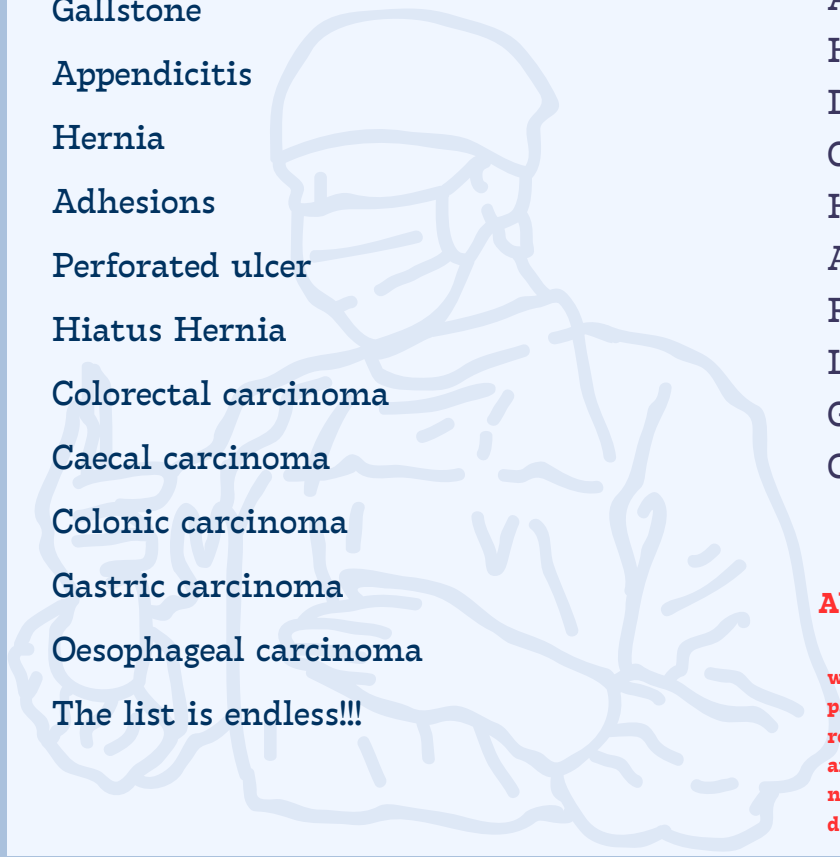
Lately laparoscopic widely use than open surgery although it is need high level of training , more carfull and expensive but minimal invasive , little complications and no need for long hospitalization and very small insist on up to 15

What operations can we do laparoscopically?

Diagnosis	Operation
Crohn's Disease	Bowel resection
Diverticulitis	Bowel resection
Rectal Prolapse	Repair of Prolapse
Benign renal disease	Nephrectomy
Gastric Obstruction	Bypass
Some Splenic disorders	Spleenectomy
Gallstone	Cholecystectomy
Appendicitis	Appendicectomy
Hernia	Hernia repair
Adhesions	Division of adhesions
Perforated ulcer	Closure of perforation
Hiatus Hernia	Hiatus hernia repair.
Colorectal carcinoma	Anterior resection/ APR
Caecal carcinoma	Right Hemicolectomy
Colonic carcinoma	Left/Sigmoid Colectomy
Gastric carcinoma	Gastrectomy
Oesophageal carcinoma	Oesophagogastrectomy
The list is endless!!!	

Easier to do laparoscopy in this condition

Specially when there is tumor , bleeding or trauma



Abdominoperineal Resection

when tumor involve rectal sphincter, the patient in continance < permanent construct> resection of tumor with Reanstamosis with anal canal which reserve the sphincter no need for resection all rectum this is depending on sphincter intact or not

Principle Differences between Laparoscopic and Open Surgery

FOR THE PATIENT

- Post operative pain related to size of incision-smaller incisions =less pain.
- Less Handling of intestines results in little or no disturbance of normal function.
- Avoidance of the trauma of abdominal wall injury by the incision allows rapid return to normal activity
- No incision allows early return to more strenuous activities: driving, lifting, sport etc.
- Initial capital costs to establish laparoscopic surgery

Bring the tools and equipments for the first time is expensive but then will save money

- Reduced overall costs by shortening of hospital stay e.g. cholecystectomy reduced from 5 to 1 day,
- Magnified view often better than obtained via an incision allows precise dissection.

Specially in surgery include tiny vessle ....

- Decrease (but not absent) tactile response

In Laparoscopy can't touch the tissue manual ,so no tactile sensation (ie; can't detect consistency of tissue is fragile ,friable , hard ....

- Two dimensional (flat screen) view.
- Usually (but not always) shorter operating time If there is proper training
- Need to develop entirely different operating technique
- Adaptation of principles of open surgery to laparoscopic surgery.

Benefits of laparoscpy

- 1. Cosmetically better Small incision
- 2. Pain and analgesia requirement less
- 3. Decreased operative trauma
- 4. Faster recovery
- 5. Early discharge
- 6. Better visualization
- 7. Magnified view of structures
- 8. Less ileus
- 9. Less chances of wound infection
- 10. Few post operative adhesions
- 11. Less chances of incisional hernia

CONTRAINDICATIONS

- Uncorrectable coagulopathy Or tendency of bleeding
- Frozen abdomen
- Intestinal obstruction with massive abdominal distension
- Haemorragic shock

If there is hemorrhage or massive abd distension —> can't see the feild by laparoscope so must turn to open surgery even the patient disagree (specially when the condition is life threatening)

- Severe cardiac dysfunction (class IV)
- Refuse conversion to open

RELATIVE CONTRAINDICATIONS

- Inability to tolerate GA
- Abdominal sepsis/ peritonitis
- Multiple previous abdominal operations Lead to multiple adhesion
- Severe COPD
- Late pregnancy

COMPLICATIONS

when enter the abd cavity either by open technique (cut about umbilicus until arrived peritonium then put Trocar to insufflation abdominal gas) or use tool end by balloon when blowed will be larger than the incision also from upper Rt quadrant enter by ferrus needle may impact vessel or bowel but not dangerous finally put Trocar

- ACCESS related ...palmer point
- • Major vascular injury • Put Trocar in random or not safe place may hurt organ like bladder... and the Most commen injury occur in RT common iliac A. Result in bleeding whic cause death sometime
- GI injury • Bladder injury • CO2 embolism
- Abdominal wall haemorrhage
- POST INSERTIONAL COMPLICATIONS

GI perforations (acute or delayed)

Laceration & bleeding from solid organs

Abdominal wall hernia أول Trocar بحطه بعدين بنحط الكاميرا وباقي الTrocar بحطهم وأنا شايف كلشي باستخدام الكاميرا

To avoid injury prefer use Visiport (camera) to see all layers
Bleeding or vessels injury need treatment and suturing

Limitations

- 1. Two- dimentional representation
- 2. Learning curve
- 3. decrease tactile sensations
- 4. Hand eye co-ordination
- 5. Cost of setting up

Types of scopes

- Different scopies
- 1- Laparoscopy: rigid scope through a metal sheath in the peritoneal cavity
- 2- Thorocoscopy: rigid scope with a small incision in the chest for access to the thoracic cavity
- 3-Endoluminal endoscopy: Upper GI
- Lower GI
- Cystoscopy
- Bronchoscopy
- Arthroscopy

Instruments

• Redesign of instruments for laparoscopic use.

• Instruments for open surgery in general 6 – 10” in length

• Laparoscopic instruments in general 15 –18” in length with an articulated connecting rod between handles and scissor blades, jaws etc.

Long enough to arrive the target organ (in obese patient use the longer one)
in obese pt may be use instrument more than 18 in length

Equipment Necessary for MAS

Camera **Adequate Angle regarding to use 0\30\45**
Light Source **Doesn’t cause injury(ex: to hot)**
Insufflator **Use co2 easy to absorb and doesn’t cause embolus or enter the vessel**
TV Monitor
Telescopes **Usually use Trocar 5 , 10 ,15 ml**
Light Guide Cable

Apart from the insufflator the system will work better if all the components are from the same company as one piece talks to another

CAMERA

• These can be single chip or 3 chip.

• CHIP: thois is also called a charged coupled device in short, CCD.

• These are flat silicone wafers with a matrix, a grid of minute image sensors called pixels.

• White balance commonly used

Optics

• • ROD LENS SYSTEM -Small lenses interspresed with large distance of air -Diameter of lens 1-5.5 mm

• FIBER OPTIC CABLES: Composed of innercore of glass of high Resistive Index (RI) & a fused sheathing of low RI Incoherent bundles have random arrangement of fibers at either end Coherent bundles – orderly arrangement of fibers

• • LIGHT SOURCES Xenon bulb (1000 hrs) – produces white light & less heat (commonly used- better) Halogen bulb (300-400 hrs) – produces yellow light & more heat

Insufflator

• CO2 because this has the same refractive index as air, so doesn’t distort the image and is non combustible.

• Intraabdominal pressure run between 10 and 18 mmhg. **important**

INSUFFLATORS

- Automatic -Pressure regulated high flow مشبوك بمنظم غازات بصير يفرغ الغازات من abdominal cavity Trocar
- -Monitor intra-abdominal pressure which is usually set at 12- 18 mmHg
- -Alarm sound or pressure release valves when pressure limit is exceeded
- -Flow rate of 8-10 litres /min
- High flow insufflators are used for obesity surgery

pneumoperitoneum

- -Required to create working space
- Gases used : O2 ,CO2 , N2O, Ne, Ar (newer) سريع الاشتعال Risk
- CO2 -commonly used **inert**
- Advantages : Does not support combustion or explosion , Rapidly absorbed, Rapidly soluble -

Disadvantage : Not readily available initially –now is available

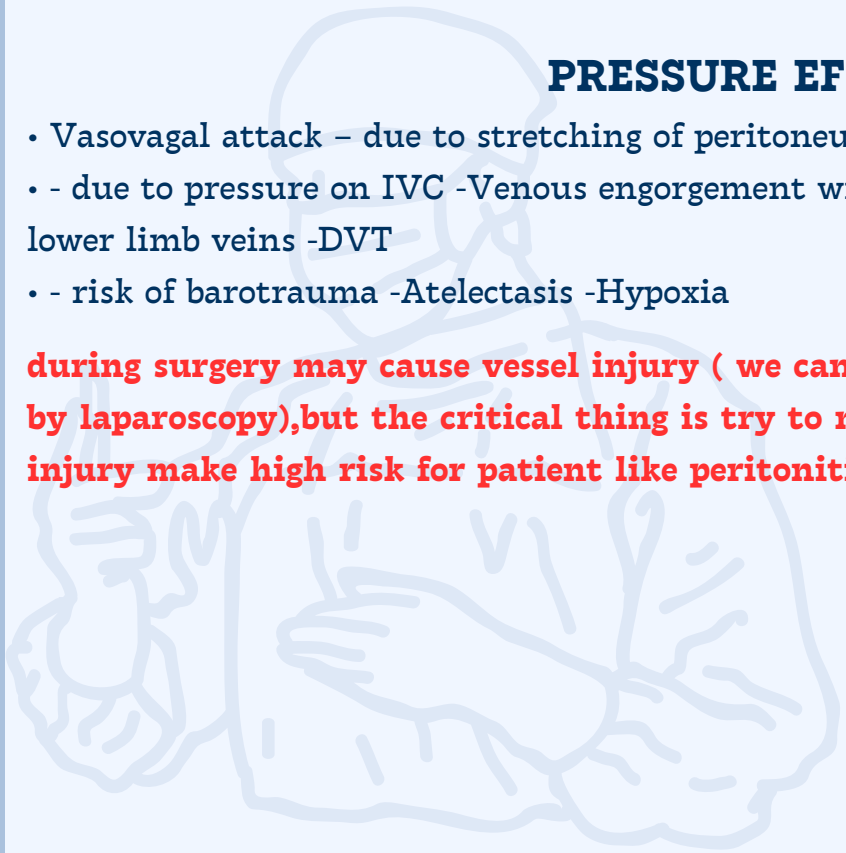
- Hypercarbia

- PNEUMOPERITONEUM- CO2 can cause Respiratory acidosis
- Hypercarbia
- Tachycardia,
- Increased vascular resistance
- Increased BP, & myocardial O2 demand Cardiac arrhythmias – Bradycardia Sudden hypotension
- May also cause: • Subcutaneous emphysema • Venous thrombosis • Pneumothorax

PRESSURE EFFECTS

- Vasovagal attack – due to stretching of peritoneum
- - due to pressure on IVC -Venous engorgement with endothelial damage of lower limb veins -DVT
- - risk of barotrauma -Atelectasis -Hypoxia

during surgery may cause vessel injury (we can do suture, repair or conversion by laparoscopy),but the critical thing is try to no or hurt less (in some cases injury make high risk for patient like peritonitis)



ABDOMINAL ACCESS INSTRUMENTS

- 1. Open Technique Hasson cannula- obtains pneumoperitoneum by open technique
- 2. Closed technique - Veress needle (Janos Veress -1938 in Hungary)
- • VERESS NEEDLE -Obtains pneumoperitoneum by closed technique – Spring loaded obturator needle
- Drawbacks: Preperitoneal placement, Injury to vessels, Injury to bowel
- • TROCARS SHEATH- Reusable & Disposable

TV Monitors

- Usually a 20" screen..
- You can use a standard TV but it must be run through an isolated transformer.
- Horizontal resolution is the number of vertical lines.
- Vertical resolution is the number of horizontal lines
- More lines of resolution, better detail of picture.

Telescopes

- Come in varying sizes, laparoscopes usually 5mm or 10mm.
- Diagnostic 3mm scope available but not in general use in this hospital.
- Made up of a rod and lens system.
- Bundles of fibres, incoherent carry light and coherent carry image.
- Wide range of angles available 0 and 30 degree are fairly standard.
- All laparoscopes are autoclavable and can go thru steris, no ultrasonic bath.

Light guide Cables

- Different diameters
- Fibre light cable

Instrumentation

- SINGLE USE: breaking the Law if you reuse it on another patient.
- Reusable take apart.
- Need an ultrasonic washer to effectively clean them, not for telescopes.
- Ports 5 , 10 12and 15mm are the most common, make sure the right trocar is in port and is it sharp.

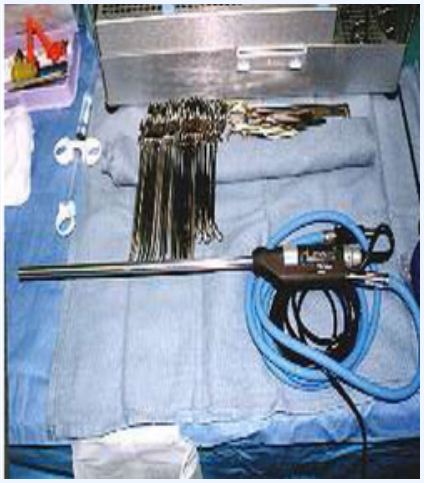
Key points

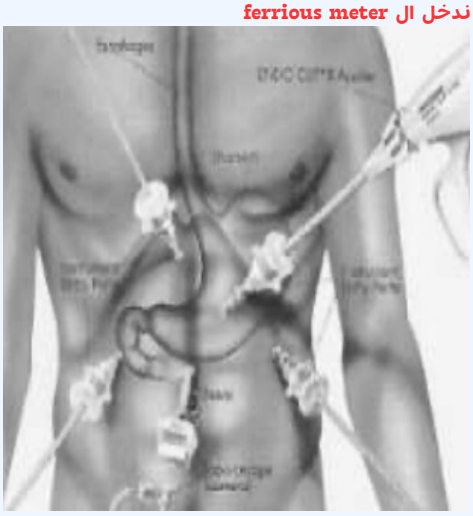
- No fluid overload
- Eating and Drinking ASAP
- Out of bed ASAP
- IV fluids D/C as patients need to be thirsty to drink!
- Urinary Catheter out, then they have to walk to bathroom !
- Avoid morphine analgesia, slows down gut and induces sleep.

Equipment

midclavicular line from the LT upper quadrants ندخل فيهم عال
ferrious meter ثم ندخل ال

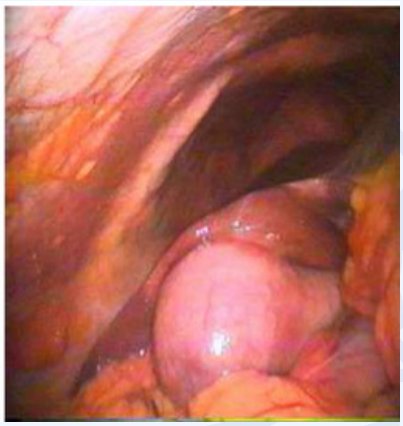
Trocar بكون فيهم

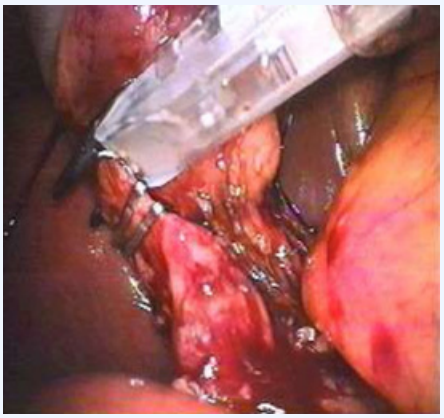




Cholecsyectomy

مثلًا عرضه 1 سم بحط clips فوقه وتحته وبعدها بعمل cut between them
وهاد االشي بتمكن منه جيًدا لما بكون شايف بالكامي with laparoscope

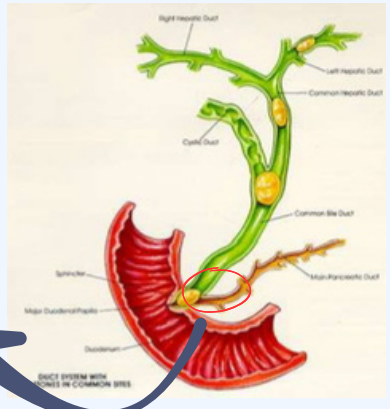




Exploration of CBD

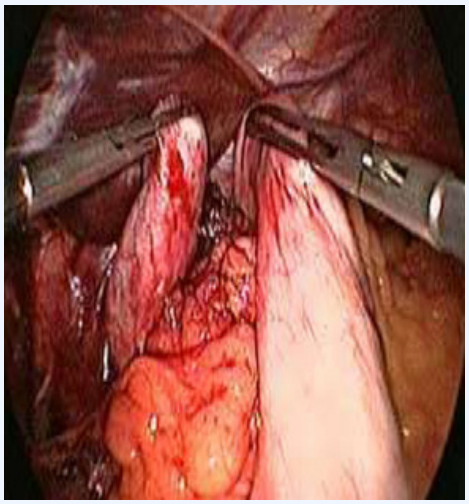
- Performed laparoscopically
- same time as cholecystectomy
- Alternative ERCP

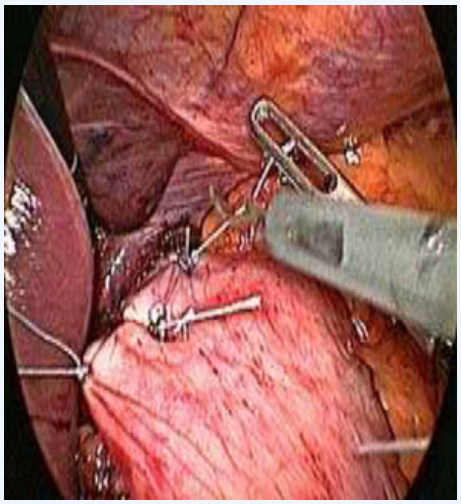
Biliary pancreatitis due to obstruction by stones
Upper GI endoscopy—> expand incision toreach stone and remove it
Which call (ERCP ; Endoscopy Retrograde CholangioPancreatico)



Nissen Fundoplication

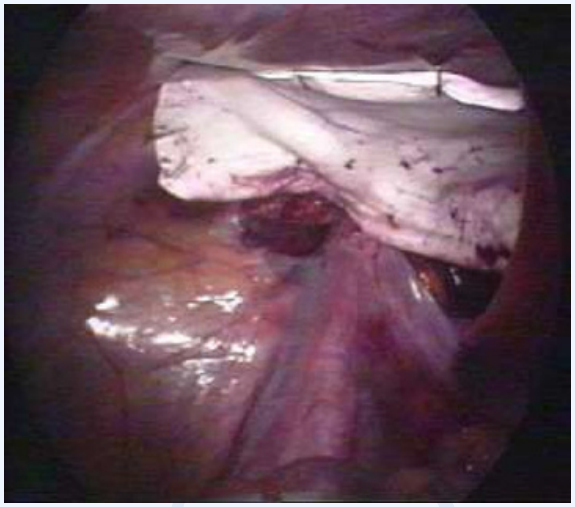
Hiatal hernia—> large defect in esophagus to narrowing it —> get 2 pouchs of stomach then circulate it around esophagus (loop ≈5cm)



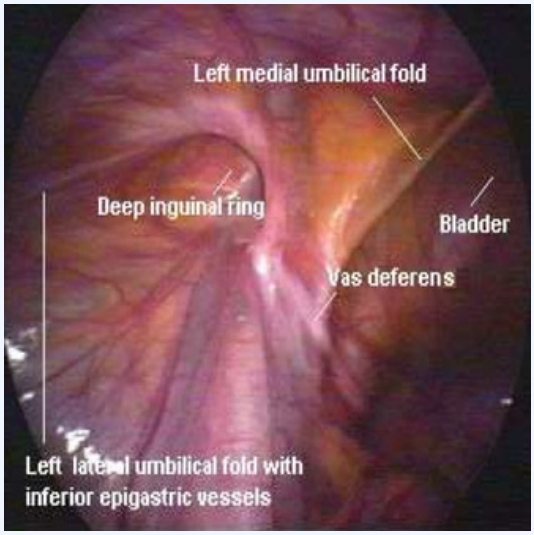


Inguinal Hernia Repair

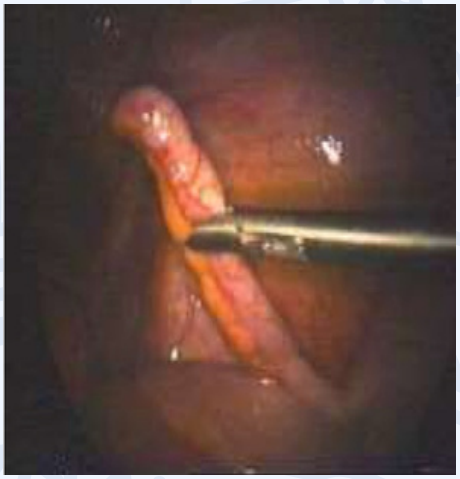
بنزل الفتق كامل ومكان ال defect بحط ال mesh وهيك بحل المشكلة كلها

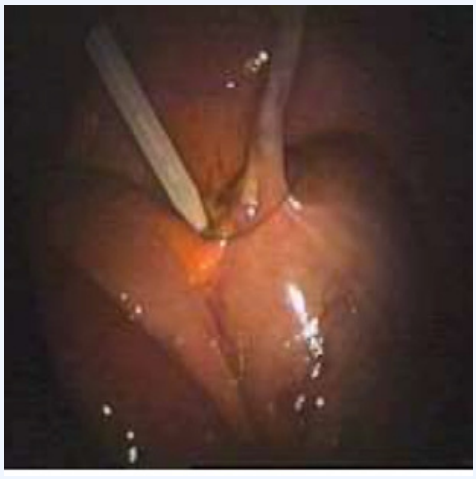


Mobilization of all ares



Appendicectomy





Use special instrument to create hiatus around appendix or use wide clips or GIA stapler to cut it