PRINCIPLES OF LAPAROSCOPIC SURGERY

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LECTURE OBJECTS :

1. DEFINITION
2. GENERAL REQUIREMENT
3. ADVANTAGES
4. DISADVATNEGES
5. PREPARATION OF PATIENT

Definition

Laparoscopy (laparo; meaning 'flank, side', and scopy; 'to see') is an operation performed in the abdomen or pelvis through small incisions with the aid of a camera.

minimally invasive surgical diagnostic procedure used to examine the organs inside the abdomen that requires only small incisions.

** It's usually performed when noninvasive methods are unable to help with diagnosis.

Noninvasive methods: ultrasound, CT scan, X ray…..

WHAT WE CAN EXAMINE?

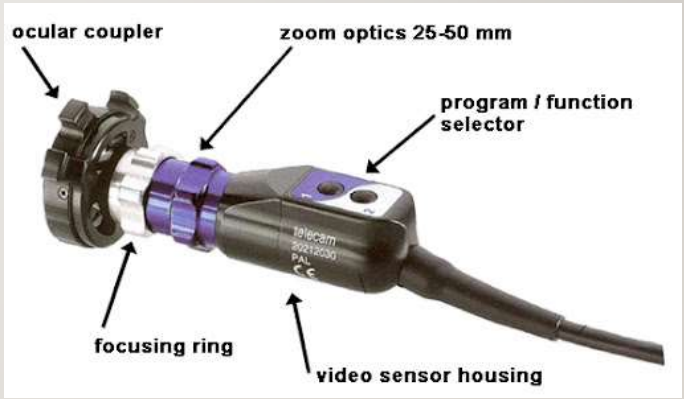
Abdominal and pelvic organs such as:	appendix	gallbladder
liver	pancreas	small intestine and large intestine (colon)
spleen	stomach	pelvic or reproductive organs

general REQUIREMENT

Optic system :

1.telescop

2.Camera



3.Light source and tv mintor

instruments

insufflator :

an equipment that combines a precise continuous-flow system and a gas heater that provides superior safety to the patient

Trocar

PROCEDURE

A rigid endoscope (laparoscope) is introduced through a port into the peritoneal cavity.
This is insufflated with carbon dioxide to produce a **pneumoperitoneum.** Further ports are inserted to enable instrument access and their use for dissection

PNEUMOPERITONEUM :

There are two methods for creation of a pneumoperitoneum: open and closed.

1. **The closed method** involves blind puncture using a Verres needle.

Although this method is fast and relatively safe, there is a small but significant potential for intestinal or vascular injury on introduction of the needle

2. The open method :

- A 1-cm vertical or transverse incision is made at the level of the umbilicus.
- Two small retractors are used to dissect bluntly the subcutaneous fat and expose the midline fascia.
- Two sutures are inserted each side of the midline incision, followed by the creation of a 1-cm opening in the fascia.
- Free penetration into the abdominal cavity is confirmed by the gentle introduction of a finger.
- Finally, a Hasson trocar (or other blunt-tip trocar) is inserted and anchored with the fascial sutures


MEDICTA
INSTRUMENTS

GASES USED :

- Co_2
- O_2
- N_2O
- Air
- He, Ne

ADVANTAGES COMPARED TO OPEN SURGERY

Decrease in wound size: 1-1.5 cm

- Most of the trauma of an open procedure is inflicted because the surgeon must have a wound that is large enough to give adequate exposure for safe dissection at the target site

Reduction in wound infection, dehiscence, bleeding, herniation and nerve entrapment

Decrease in wound pain

- - Wound pain prolongs recovery time

- Improved mobility

- by reducing mobility, open surgeries contributes to an increased incidence of pulmonary atelectasis, chest infection, paralytic ileus and deep venous thrombosis

- Decreased wound trauma

- Mechanical and human retractors cause additional trauma. Body wall retractors tend to inflict localized damage that may be as painful as the wound itself. In contrast, during laparoscopy, the retraction is provided by the low-pressure pneumoperitoneum, giving a diffuse force applied gently and evenly over the whole body wall, causing minimal trauma

- Improved vision

- Decreased heat loss

Exposure of any body cavity to the atmosphere also causes morbidity through cooling and fluid loss by evaporation.

- There is also evidence to suggest that the incidence of post-surgical adhesions has been reduced by the use of the laparoscope because there is less damage to delicate serosal coverings.

DISADVANTAGES COMPARED TO OPEN SURGERY

- **Reliance on remote vision and operating**

To perform minimal access surgery with safety, the surgeon must operate remote from the surgical field, using an imaging system that provides a two-dimensional representation of the operative site. The endoscope offers a whole new anatomical landscape, which the surgeon must learn to navigate without the usual clues that make it easy to judge depth

- **Dependence on hand–eye coordination**

The instruments are longer and sometimes more complex to use than those commonly used in open surgery. This results in the novice being

- **Difficulty with haemostasis**

  when there is intraoperative arterial bleeding, Haemostasis may be very difficult to achieve endoscopically because blood obscures the field of vision and there is a significant reduction of the image quality owing to light absorption.

- **Extraction of large specimens**

  In more advanced techniques, large pieces of resected tissue, such as the lung or colon, may have to be extracted from the body cavity. Occasionally, the extirpated tissue may be removed through a nearby natural orifice, such as the rectum, or the mouth.

- **Loss of tactile feedback**

- **Reliance on new techniques**

PREPARATION OF THE PATIENT

- ***History***

* fit for general anesthesia

* Potential coagulation disorders (e.g. associated with

cirrhosis) are particularly dangerous in laparoscopic surgery.

* previous abdominal operations or peritonitis ,as adhesions may cause problems.

• Examination

* Although, in general, laparoscopic surgery allows quicker recovery, it may involve longer operating times and the establishment of the pneumoperitoneum may provoke cardiac arrhythmias.

* Particular attention should be paid to the presence or absence of jaundice, abdominal scars, palpable masses or tenderness.

* Moderate obesity does not increase operative difficulty significantly, but massive obesity may make pneumoperitoneum difficult and standard instrumentation may be too short. Access may prove difficult in very thin patients, especially those with severe kyphosis.

- **Premedication**

Premedication is the responsibility of the anesthetist, with

whom coexisting medical problems should be discussed.

- **Prophylaxis against thromboembolism**

*Venous stasis induced by the reverse Trendelenburg position during laparoscopic surgery may be a particular risk factor for deep vein thrombosis, as is a lengthy operation and the obesity of many patients.

* Subcutaneous low molecular weight heparin and antithromboembolic stockings should be used routinely in addition to pneumatic leggings during the operation.

* Patients already taking warfarin for other reasons should have this stopped temporarily or converted to intravenous heparin, depending on the underlying condition, as it is not safe to perform laparoscopic surgery in the presence of a significant coagulation deficit.

• Urinary catheters and nasogastric tubes

* It is essential to check that the patient is fasted and has recently emptied the bladder, particularly before the blind insertion of a Verres needle.

• Informed consent

* It is essential that the patient understands the nature of the procedure, the risks involved and, when appropriate, the alternatives that are available.

* The patient should understand what laparoscopic surgery involves and that there is a risk of conversion to open operation.

* If known, this risk should be quantified, for example the increased

risk with acute cholecystitis or in the presence of extensive upper

abdominal adhesions.

* Common complications should be mentioned, such as shoulder tip pain and minor surgical emphysema, as well as rare but serious complications, including injury to the bile ducts and visceral injury from trocar insertion or diathermy.

- **Intraoperative perforation of the gall bladder**

it is well known that bile is not a sterile fluid and bacteria can be present in the absence of cholecystitis. Unless the perforation is small, closure with endoloops or endoclips should be attempted to avoid contamination.

- **Bleeding:**
- Risk factors that predispose to increased bleeding include:

* cirrhosis

* inflammatory conditions (acute cholecystitis, diverticulitis)

* patients on anticoagulant therapy

* coagulation defects

((these are contraindications to a laparoscopic procedure.))

- **Nausea**

About half of patients experience some degree of nausea after laparoscopic surgery, It usually responds to an antiemetic

- **Shoulder tip pain**

the pain is referred from the diaphragm and not due to a local problem in the shoulders, it's relieved by analgesics

- **Abdominal pain**

Increasing pain after 2–3 days may be a sign of infection , antibiotic therapy is occasionally required

Herniation may account for localised pain too.

- ***Analgesia***

  diclofenac may be given at the time of the operation

  Opiate analgesics cause nausea and should be avoided unless the pain is very severe.

- ***Orogastric tube***

  An orogastric tube may be placed during the operation if the stomach is distended and obscuring the view, It should be removed as soon as the operation is over and before the patient regains consciousness.

- ***Oral fluids***

  There is no significant ileus after laparoscopic surgery so Patients can start taking oral fluids as soon as they are conscious.

- ***Oral feeding***

  a light meal can be taken 4–6 hours after the operation.

  they can eat a normal diet but should avoid excess.

- ***Urinary catheter***

  it should be removed before the patient regains consciousness .

  The patient should be warned of the possibility and symptoms of postoperative cystitis.

FURTHER DEVELOPMENTS THAT HAVE MADE MINIMALLY INVASIVE SURGERY EVEN LESS INVASIVE

- Single incision laparoscopic surgery (SILS) is a technique adopted by some surgeons to insert all the instrumentation via a single incision, through a multiple channel port via the umbilicus to carry out the procedure
- The benefit is that only one incision, through a natural scar (the umbilicus), is made therefore these procedures are virtually 'scarless'. Second, less port sites around the abdomen have the potential for less pain, less risk of port site bleeding and reduced incidence of port site hernia
- There has been an explosion of activity in SILS procedures in the last few years and in some units, laparoscopic cholecystectomies and hernias are routinely started as SILS cases. However, the clinical benefit for this technique which has a difficult and steep learning curve is still awaited from randomised trials being carried out internationally.

THANK YOU