ENDOSCOPY IN GYNAECOLOGY

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Endoscopy in Gynaecology

- Use of a camera, through minimal access, in body cavities for diagnostic or operative procedures. It includes:
  - Laparoscopy
  - Hysteroscopy
  - Fallopianoscopy
  - Cystoscopy
Laparoscopy

- It is a technique which allows viewing (Diagnostic) and surgical maneuvers (Therapeutic) to be performed in abdominal organs through a surgical incision of < 1cm with help of pneumoperitoneum.

- Intra-peritoneal endoscopic technique

- Successful operative laparoscopy requires three essential ingredients:

  1. Surgical skill
  2. A well designed and equipped Operating Room;
  3. A surgical team.
Advantages

• Permits visualization of pelvic structures

• Diagnosis of gynaecologic conditions

• Pelvic surgery without laparotomy

• Lower morbidity

• Cost-effective: shorter hospital stay, earlier return to work
Limitation of Laparoscopy

- Reduced exposure of operating field
- Skilled person
- Expensive Instruments
- Cost is high
- Prolonged operating time
- Prolong anaesthesia
- Minimal access increases risk of injuries, burns
History:

• First performed on dogs in 1900s
• Jacobaeus first coined the word ‘Laparoscopy’ in 1910
• Better techniques/Modifications in the 1960s
  • Almost exclusively for diagnostic purposes and sterilization
• Introduced in Nigeria in the early 1970s by JHPIEGO -- Sterilization
• Indications expanded by the late 1970s
Patient Preparation & Counseling

• Counseling about the procedure & expected outcome
• Bowel Preparation to facilitate the visualization of operative area & reduce chances of bowel injury
Equipment & Technique

- Patient positioning
- Operating room organization
- Peritoneal access
- Visualization
- Manipulation of tissue & fluid
- Cutting, haemostasis, & tissue fastening
- Tissue extraction
- Incision management
Insertion site of Insufflation needle and primary canula
Disposable Trocar’s of Various sizes 12mm to 2.7mm
Reusable Devices
Trocar and canula
Laparoscope degree 2, 5, 10 mm
Graspers Curved Straight and manipulators
Veress (Insufflation) Needle
Uterine manipulator
Radio frequency electrosurgical generator
Ligating cutting and shearing device
Laparoscopic Cutting devices
Specimen removal bag
Electromechanical Morcellator
Electronic insufflator
Procedure

- Patient preparation
  - NPO
  - Informed consent
- Anaesthesia
  - General Anaesthesia
- Position:
  - Tredelenburg, Lloyd-Davies
- Set up uterine manipulator/cannula for dye test
  - Sparksman’s cannula & vulsellum
- Midline infra umbilical incision
- Lifting of Abdominal wall
- Insertion of Insufflation needle or (Varies needle)
- Creation of pneumoperitoneum with CO2
- Check the needle position in peritoneal cavity
- Intraperitoneal Pressure for placement of trocar & canula 20-25 mm then reduced to 10-12 mm
- Insertion of Laparoscope with camera after white balancing
- Creation of ancillary ports
- Maintaining peritoneal distension
Procedure: obtain pneumoperitoneum

Important, as >50% of complications occur at this stage

- Patient should at first lie flat
- (Sub)umbilical puncture
- Introduce Veress needle for insufflation (45° in non-obese patients)
- Ensure valves on all instruments are closed
- Insufflate 2-3 litres of CO2 (or room air); watch pressure gauge
Safety mechanism of Veress needle

• Check for loss of liver dullness
• Tilt patient back into Lloyd-Davies position
• Widen puncture, insert trocar and cannula at 45°
• Remove cannula; insert laparoscope under direct vision
• After procedure, remove laparoscope under direct vision
2. Creation of pneumoperitoneum:

a. The abdominal wall is lifted by hand or by grasping forceps
b. Pneumoperitoneum is created by verres needle introduced to the umbilical area (less subcutaneous and preperitoneal tissue).
c. The needle is inserted in an oblique angle toward the uterine fundus
d. The negative pressure will allow the underlying structures to fall away.
e. After making sure that the needle is in correct position, air flow can be increased to 2.5 liters per minute till a pressure of 15mmHg
3. Trocar introduction

a. Once the intra-abdominal pressure reaches 15 mmHg the main trocar is introduced after removal of veress needle.

b. The position of the trocar must be verified by inserting the laparoscope and viewing the pelvic cavity.
4. Viewing the peritoneal cavity:

A. The omentum, bowel and bifurcation of pelvic vessels should be evaluated to avoid injuries caused during the introduction of Verres needle or trocar.

B. The site of introduction of other trocars should be verified by finger palpation and transillumination of abdominal wall to avoid injury to epigastric vessels.

C. Identify if there is any bleeding
After the procedure CO$_2$ gas must be evacuated completely to reduce post-operative pain

In operative procedures:
- 1 or 2 bottles of Ringer’s lactate are used to wash the peritoneal cavity after laparoscopy.
- Leave 500/1000 cc of ringer’s lactate to reduce the incidence of post operative pain.
Indications

Used as a diagnostic tool

- Infertility: status of the fallopian tube (morphology and functionality) and any pathological condition e.g. adhesions.
- Ovarian cysts or tumors.
- Ectopic pregnancy.
- PID: tubal abscess or adhesions.
- Endometriosis: define the sites of implants and endometrial cysts.
Ovarian Cyst

Adhesions between the omentum and uterus
Ectopic pregnancy
As a therapeutic tool

- Management of ovarian cyst by:
  - Drainage.
  - Ovarian cystectomy.
  - Ovarian drilling of the cortex and stroma to decrease androgens in the ovaries
- Correcting ovarian torsion.
- As a treatment of endometriosis
  - By removal of the endometrial cyst, cauterization of endometrial spots and adhesiolysis
As a therapeutic tool

- Management of infertility:
  - Adhesiolysis
  - Treat the cause (endometriosis, PCOS)
- Myomectomy for fibroids: used for subserosal and intramural fibroids only, not used for submucosal fibroids.
- Management of PID: by draining tubal abscess and adhesiolysis.
Adhesiolysis

Myomectomy
Management of ectopic pregnancy:

- Salpingotomy or salpingostomy
  - Used to preserve the tubes for desired reproductivity.

- Salpingectomy (it is the standard for ectopic pregnancy)
  - Ruptured tube
Indications

- Tubal sterilization by:
  - Bipolar coagulation.
  - Clips (filshie clips) and rings
  - Before doing this you should consult the patient about three things
    - Chance of irreversibility
    - Failure rate 1/200
    - Bleeding may occur and we may shift to laparatomy.
  - Laparoscopic hysterectomy.
Contraindications

1. Generalized peritonitis
2. Hypovolemic shock
3. Severe cardiac disease
4. Hemoglobin less than 7 g/dL
5. Uterine size > 12 wks.
6. Multiple previous abdominal procedures
7. Extreme body weight
Complications

- Pneumoperitoneum:
  - Extraperitoneal emphysema due to failure of introducing verres needle correctly into the peritoneal cavity and not checking the negative pressure on the machine.
  - Gas may extend to the mediastinum and compromise cardiac function
  - Pneumoomentum: and put the patient on the trendlenberg

- Injury to abdominal organs
  - GI: if the intestine is distended or adherent to the abdominal wall (prevented by good intestinal preparation) and putting the patient on the tredelenburg position.
  - Bladder injury: prevented by emptying the bladder.
Complications

Blood vessel injury:

- Pelvic, omental and mesentric
- Prevented by introducing the verres needle in an angle.
- In obese patients you can insert the needle in straight manner because of the thick fatty layer.
Hysteroscopy

• Definition:

• It is a technique which allows viewing and surgical maneuvers to be performed in the uterine cavity.

• It has many advantages that made it wide spread and fundamental diagnostic method in daily gynecological practice.
Hysteroscopy
Hysteroscopy

History:
- Pantaleoni 1869 first described
- CO₂ added by Rubin in 1925
- Refinement in the last few decades
  - Office procedure since the 1970s
  - Fibreoptic instrumentation
  - Operative accessories
Instruments

1. Distention media of the uterine cavity (CO₂ distention)
2. Light source.
   xenon light source gives the best image quality
3. Camera Equipment

4. Endoscope
   flexible: high cost and fragile cannot be autoclaved.
   rigid: gives different direction of the view.
     - 0°, 12°, 30° (best for diagnostic purpose).
5. Hysteroscope:

There are 2 types of hysteroscopes:

Diagnostic
Therapeutic
1. **Preparation of the patient:**

- Detailed history and complete physical examination
- It is preferable to do the procedure in the first part of the menstrual cycle, because there is less mucus (better viewing) and no chance of encountering early pregnancy
- Informed consent
- Patient is placed in lithotomy position
- Accurate bimanual examination to assess the uterine (position, morphology, volume).
Procedure

2. Technique:

- Clean cervix with antiseptics
- Cervical forceps is placed on the front labia
- Light source & CO2 gas supply are connected to the instrument
- Insert hysteroscope into the cervical canal, which dilates from the gas pressure.
Hysteroscopy

Distension medium

- Flexible hysteroscope
  - Carbon dioxide

- Rigid hysteroscope
  - Saline
  - Ringer’s lactate
  - Glycine
  - Dextran
Indications for Hysteroscopy

Therapeutic

• Resection of uterine synechiae
• Resection of septa
• Removal of polyps
• Removal of foreign bodies: IUCDs, retained fetal bone
• Resection of submucous fibroids
• Endometrial ablation
Indications for Hysteroscopy

Diagnostic

- Abnormal uterine bleeding
- Persistent vaginal discharge
- Uterine malformations
- Asherman’s syndrome
- Evaluation of abnormal finding on USS (eg. endometrial thickening) or HSG
Contraindications to Hysteroscopy

- Heavy bleeding
- Established cancer of genital tract
  - Can disseminate
  - Will not influence management
- Viable pregnancy
- Active pelvic inflammatory disease, Current vaginitis, cervicitis and endometritis
- Uterine perforation
- Allergy to distending medium/anaesthetic agent
- Inexperienced surgeon
Anaesthesia for Hysteroscopy

Diagnostic (short procedures)
- Intravenous sedation
- Paracervical block

Therapeutic (prolonged manipulation)
- Regional
- General anaesthesia
Complications of Hysteroscopy

- Uterine perforation
- Cervical damage (from dilatation)
- Bleeding
- Infection
- Hazards of fluid distension media
- Gas embolism
- Haematometria & cyclical pain
Complications

- Complications related to distention media:
  - due to CO2 insufflation:
    - Cardiac arrhythmia due to excessive absorption.
    - Gas embolism.
    - We use hysteroflator that insufflate pressure of 100-120 mmHg constantly without exceeding the safety limit.
  - due to fluid:
    - HMW (dextran)
    - Anaphylactic reaction
    - Pulmonary edema
    - Adult RDS
Complications

- LMW (saline)
  - Fluid overload: prevented by keeping the operating time to minimum.
  - Avoid entering vascular channels.
  - Close monitoring of fluid balance.
  - If you exceed 1000 ml of infused fluid stop the procedure.

- Intraoperative complications:
  - Uterine perforation (<1%)
  - Hemorrhage either from:
    - Perforation
    - Tenaculum used to hold the cervix.

- Trauma.
- Thermal damage.
Complications

- **Late onset:**
  - Infections: like acute PID, so we give prophylactic antibiotics.
  - Vaginal discharge: common after ablative procedures and it is self limiting.

- **Adhesion formation:**
  - Common after myomectomy when 2 fibroids are located opposite to each other in the uterine wall.
  - To prevent the adhesions it is better to remove the fibroids in stages, and give estrogen (to build up the endometrial) therapy directly after resection. And also we can use IUCD.
Hysteroscopy – Important details

- Saline/Ringer’s lactate may conduct electricity
  - Use only for diagnostic procedures
  - Never use with electrosurgery

- Must monitor flow rate of distension medium
  - Avoid intravascular volume expansion/pulmonary oedema
Conclusion

• Minimal access techniques have become increasingly popular, and are the standard of care for many procedures.

• Laparoscopy is the most important gynaecologic endoscopic procedure.

• Medical students are highly encouraged to observe the procedure and get acquainted with the instruments!
THANK YOU!