

NEET SS OBG
LAPAROSCOPY &
HYSTEROSCOPY

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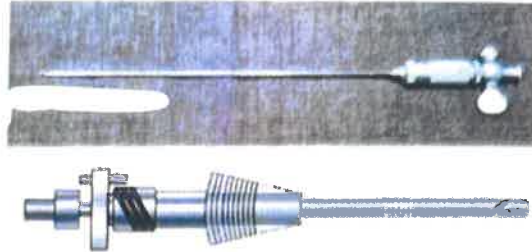
LAPAROSCOPY BASICS AND INSTRUMENTS

Veress needle

00:00:59

Structure :

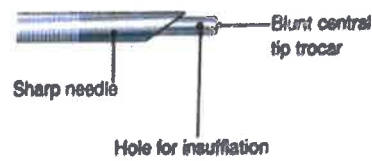
1. Tip
2. Drum.
3. Channel : For attaching syringe.



Tip :

Has 2 parts :

- a. Blunt central tip trocar.
(Held by spring action).
- b. Sharp needle.



Parts of veress needle

Mechanism of action :

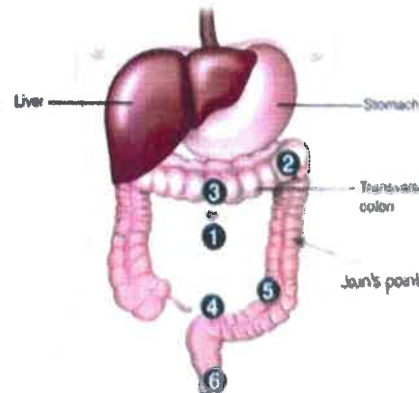
Pushing against abdominal wall → Resistance → Blunt tip goes inside → Sharp needle pierces abdomen → Loss of resistance → Blunt tip comes out → Prevention of further damage.

Uses :

- Creating pneumoperitoneum in laparoscopy.
- Aspirating fluids from peritoneal cavity.

Sites of insertion :

1. Umbilical (m/c).
2. Left subcostal : **Palmar point** (2nd m/c).
3. Median supra-umbilical : **Lee Huang point** (3rd m/c).
4. Median supra-pubic.
5. Left iliac fossa (LLQ).
6. Transcervical, transvaginal.
7. Jain's point.



Sites of insertion

Reason for umbilicus to be the m/c point of entry :

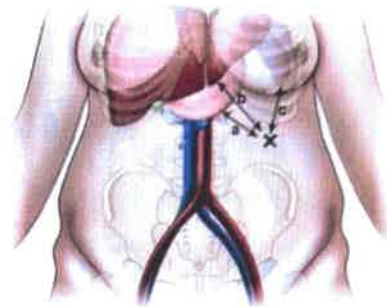
1. Abdominal wall thinnest at umbilicus.
2. more cosmetic.

Reasons for supra umbilical entry :

1. Large pelvic pathology.
2. Extensive adhesions.

Palmar point :

- Location : Two fingerbreadths below subcostal margin in mid-clavicular line.
- Uses : In case of previous vertical scar.
- Check for :
 1. Dilated stomach.
 2. Enlarged spleen.
 3. Enlarged lobe of liver.



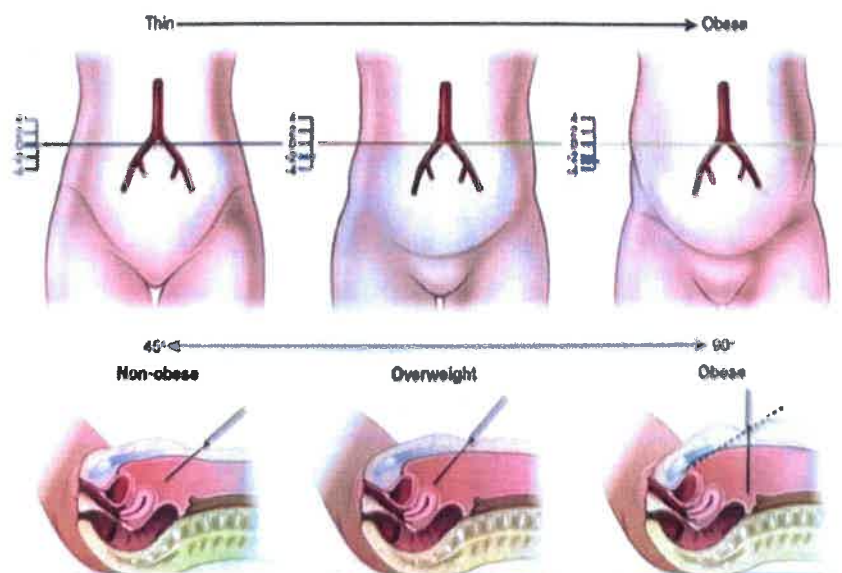
Palmar point

Effects of obesity on umbilical entry :

- With obesity umbilicus moves down d/t sagging.
- Normal angle of entry : 45° (To avoid great vessels).
- In obese patients, angle of entry : increases upto 90° .
- Umbilical entry in :

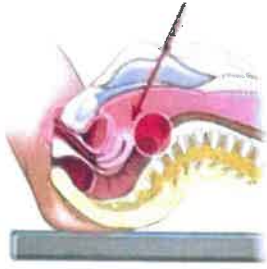
Non obese patients : Dangerous but easier.
Obese patients : Safer but difficult.

Effect of obesity on location of great vessels

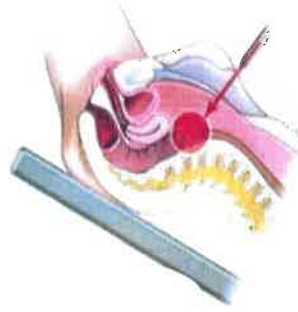


Trocar inserted at 45° with operating table flat.

Trocar inserted at 45° becomes 90° in Trendelenburg position.



Trocar insertion with operating table flat



Position of the trocar and great vessels in Trendelenburg

method of use :

1. Check that needle is working (Spring action).
2. Flush with saline.
3. Incision at umbilicus.
4. Hold correctly : Pen grip manner.
5. Lift abdominal wall and insert.



Clicks while inserting :

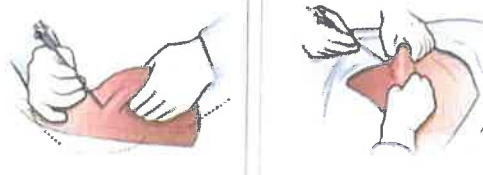
Clicks felt d/t loss of resistance.

2 clicks at umbilicus d/t :

1. Anterior layer of rectus sheath.
2. Peritoneal layer.

3 clicks at above umbilicus d/t :

1. Posterior layer of rectus sheath.
2. Anterior layer of rectus sheath.
3. Peritoneal layer.



Steps of insertion of veresss needle

methods to check proper insertion :

- Aspirate.
- Flush.
- Saline drop test.

Insufflator settings :

1. Set pressure :

- maximum pressure the machine allows to build up inside abdominal cavity.
- Normal set pressure : 14-16mmHg (max 18-20mmHg at time of entry)
- Less pressure : Less distention of the abdominal wall.
- more pressure : IVC compression.

2. Set flow :

- For Veress needle : 2-3L/min.
- For trocar : 10-14L/min.

3. Actual pressure :

- must not exceed set pressure.
- Value of 10mmHg at the start confirms proper insertion of veress needle.
- Value of high pressure (near 25mmHg) indicates large resistance to flow of gas d/t improper insertion of veress needle.

4. Actual flow

5. Total volume of gas used :

- Normal BMI patients : 2-2.5L.
- Thin patients : 1.5L.
- Obese patients : 3L.

Complications :

- Injury to omentum and its vessels.
- Bowel injury.
- Bladder injury.
- Injury to great vessels.

management of complications :

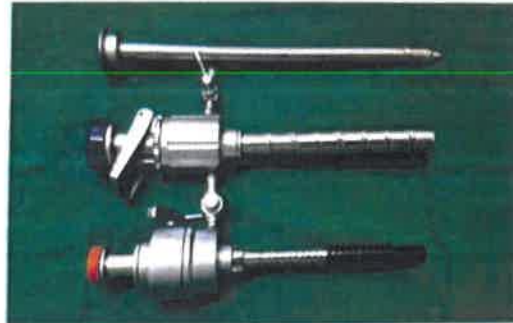
- Do not remove needle.
- Explore the abdomen immediately.
- Call for concerned specialist.

Size : 10mm/7mm/5mm

Types : spiral & non-spiral

Parts :

- Trocar : Sharp tip.
- Cannula : Outer covering.
- Gas port : For inflow.
- Drum : Contains one way valve (Prevents leakage of gas).



Trocar



One way flap mechanism

Trocar placement :

Primary trocar : (Similar to veress needle).

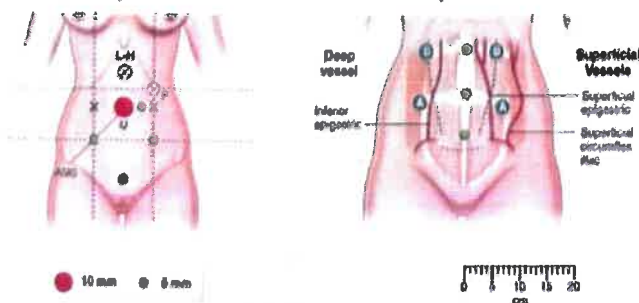
1. Umbilical (m/c).
2. Supra-umbilicus (and m/c).
3. Palmer's point.

Accessory trocars :

1. Junction of lateral 1/3rd and medial to 2/3rd of spino-umbilical line.
2. mirror image of primary trocar.
3. 10cm from primary trocar & 2cm inside.

Note :

- During laparoscopy, surgeon stands to the **left** of the patient.
- Instruments should be triangulated and not in a straight line.
- Ipsilateral port placement : Both ports on same side.
- Contralateral port placement : Diamond shaped & on both sides.



Points of placement

Various methods of insertion :

- With prior veress insufflation.
- Direct trocar entry (Can be risky).
- Hasson's technique (Open laparoscopy) :
Opening all layers of abdominal wall & then trocar is placed.

Trocars with safe entry :

Optical view trocar :

Entry under direct vision through transparent tip.

Ternamian endo tip trocar :

Trocar with sharp sleeve at the tip.

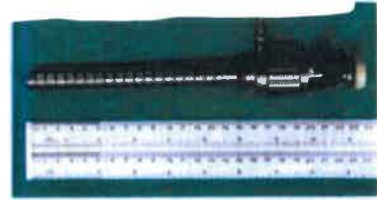
Turning of the tip causes abdominal wall layers to move away.



Trocar for Hasson's method



Optical view trocar



Ternamian endo tip trocar

Other instruments in laparoscopy

00:49:40

Graspers :

To hold tissues.

Types : Blunt or Traumatic (Toothed).



A Maryland



D Right-angle dissector



B Blunt



C Babcock



E Alligator



F Fenestrated

Graspers

Bipolar forceps/bipolar graspers also used



Needle holder :

Types :

- Straight handle (Ethicon type).
- Bent handle (Storz type).

uses : Laparoscopic suturing/myomectomy, AKA intracorporeal suturing.



Needle holder

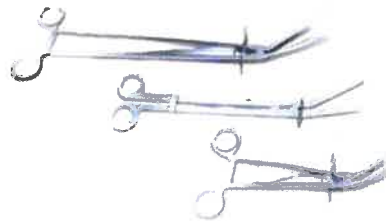
uterine manipulator :

Types :

Standard V-shaped

Hulka manipulator.

mangeshikar manipulator.



Standard V-shaped



Hulka manipulator



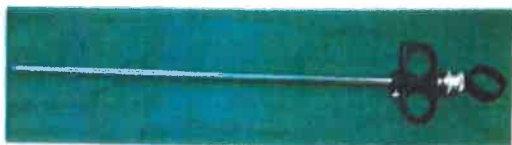
mangeshikar manipulator



PCO drilling needle



myoma screw



Band applicator



monopolar hook

LAPAROSCOPIC ANATOMY OF ANTERIOR ABDOMINAL WALL

Anatomy of anterior abdominal wall

00:00:19

Layers of the abdominal wall :

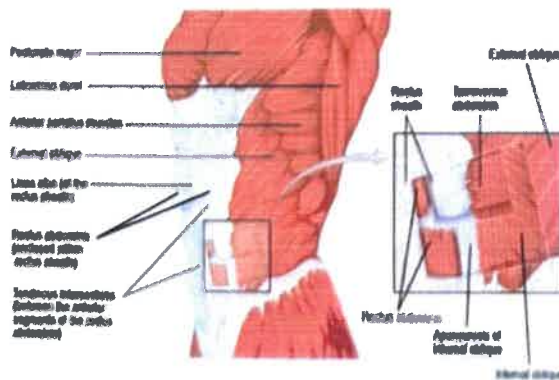
- Skin.
- Subcutaneous tissue.
- Anterior layer of rectus sheath.
- Rectus abdominis muscle.
- Posterior layer of rectus sheath.
- Peritoneum.

Significance :

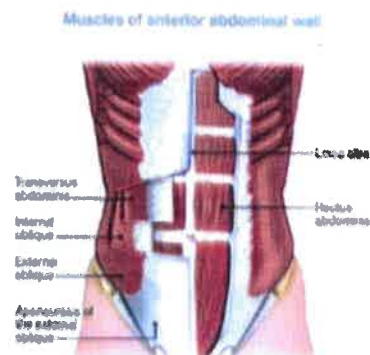
- Trocar placement positions.
- Trocar introduction techniques.
- Avoiding vascular and nerve injuries.
- Post operative analgesia.

Trocar Placements : Veress Needle & Primary Trocar

- Umbilical, supra umbilical or infra umbilical.
- Number of give ways.
- Oblique or vertical entry.

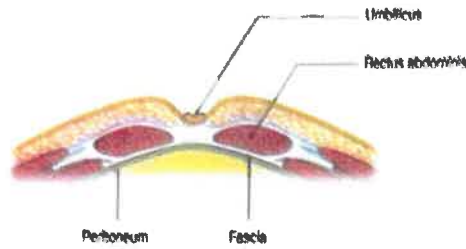


Layers of abdominal wall.



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Layers of abdominal wall :



Layers of abdominal wall.

Below the arcuate line posterior layer of rectus sheath is deficient → One less loss of resistance of the trocar is inserted.

What the trocar pierces :

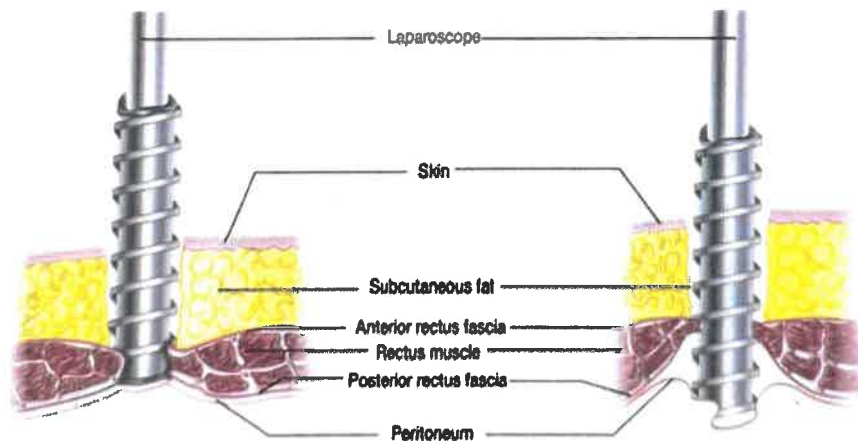
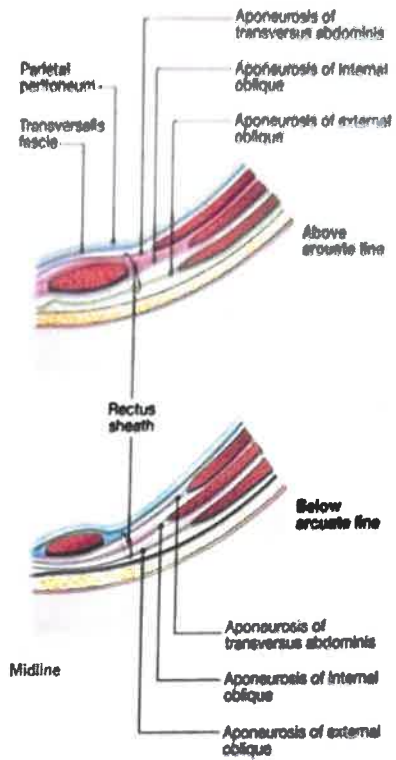
Above the arcuate line :

First give way : Anterior layer of rectus sheath.

Second give way : Posterior layer of rectus sheath.

Third give way : Peritoneum.

Below the arcuate line : Second giveaway is absent.



Trocar pieces.

Veress needle

00:07:34

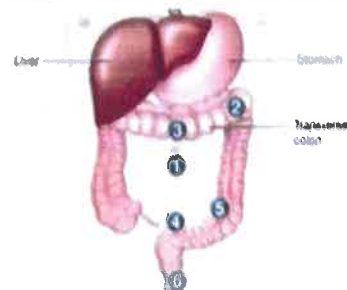
Sites of Insertion :

1. Umbilicus :

Advantages :

- Scar is cosmetic.
- Abdominal wall is thinnest at this region.

- ① Umbilical
- ② Left subcostal (midclavicular)
- ③ Median supra-umbilical
- ④ Median supra-pubic
- ⑤ Left iliac fossa (I.L.O.)
- ⑥ Transcervical, transvaginal



Sites of insertion.

- Least vascular part.
- made up entirely of aponeurosis, extension of incision is possible.

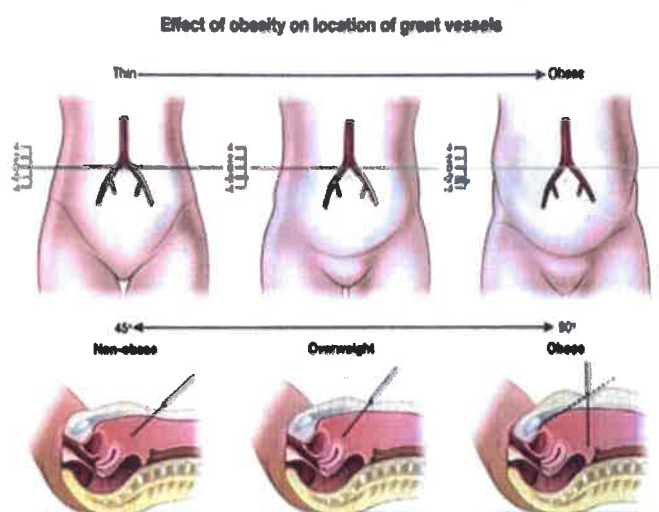
2. Left subcostal :

- Indication : Dense adhesions of anterior abdominal wall with the bowel.
- Also known as palmer's point.

3. median supraumbilical :

- Also known as Lee huang point.
- used in cases of large masses.

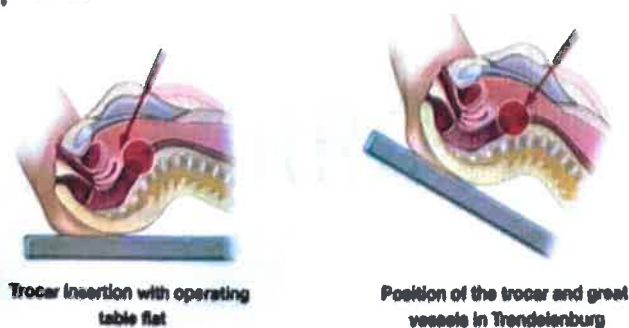
Effect of obesity :



In an obese patient → Umbilicus sags down :

- Trochar inserted at a 45° angle in an average weighted patient to avoid puncture of major blood vessels.
- Trochar can be inserted at right angle in an obese patient, as umbilicus sags down from the original point.

Trendelenberg position :



Trendelenberg position is never given before inserting the primary trochar, can puncture the great vessels.

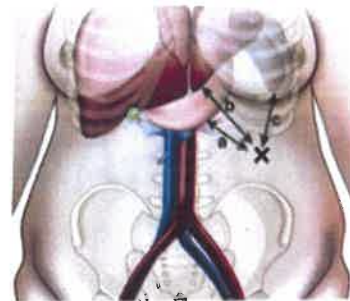
Palmer's point :

Point 2 inches below the subcostal margin in the mid-clavicular line on the left side.

Significance : Always free from adhesions.

Structures at risk of getting damaged :

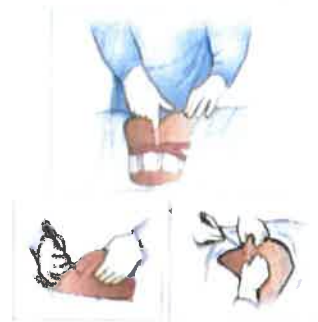
1. Enlarged stomach,
2. Enlarged left lobe of liver.
3. Enlarged spleen.



Note : Organomegaly is the only CI to use of palmer's point. Palmer's point.

method of use :

- Check that needle is working.
- Flush with saline.
- Incision.
- Hold correctly.
- Lift abdominal wall and insert.



method of use.

Port placement :

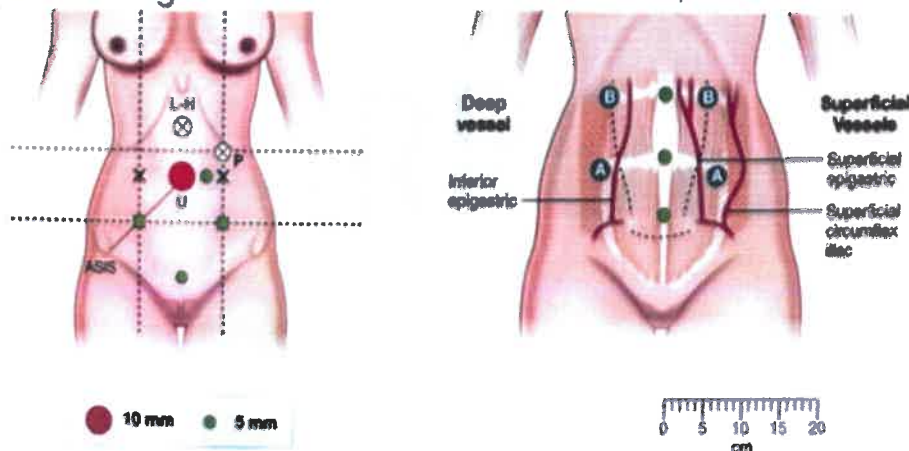
main trochar (10 mm) is placed at the umbilicus.

Accessory trochars (5mm) are placed at the junction of medial 2/3rd and lateral 1/3rd of spinoumbilical line.

Significance : Inserted at the same level of inferior epigastric artery, can get damaged.

Lower accessory trocars are inserted after transillumination of skin.

Upper accessory trocars are inserted lateral to rectus sheath.

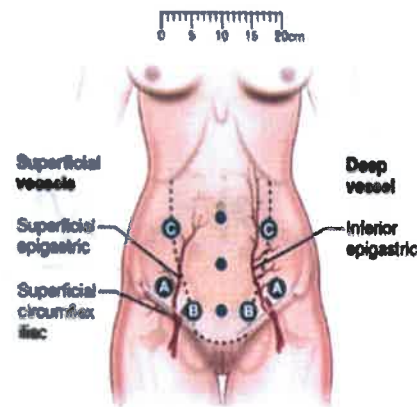


Port placement.

vessels of the abdominal wall :

Inferior Epigastric vessels :

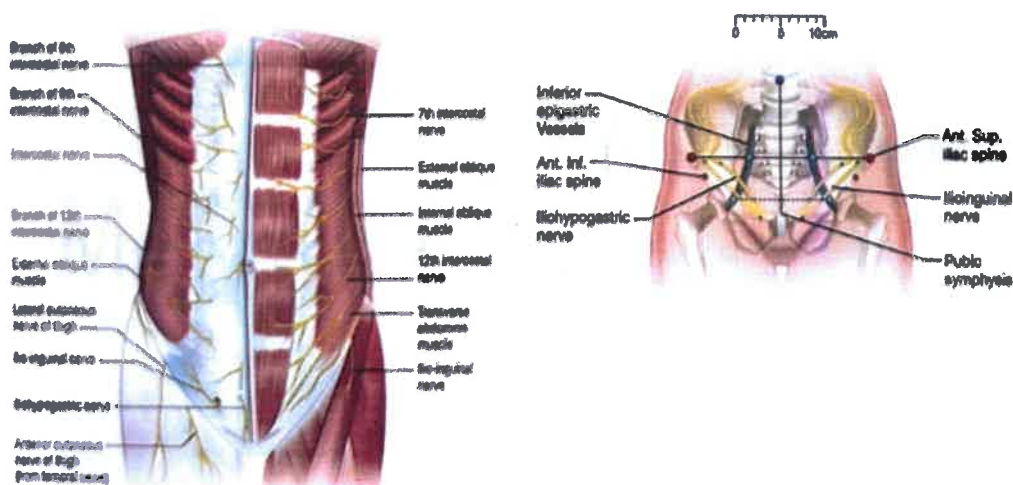
- Prone to injury during insertion of accessory 5mm trocars.
- Insert lower accessory trocars after transillumination of skin.
- Insert upper accessory trocars lateral to rectus sheath.



vessels of the abdominal wall.

Nerves of the abdominal wall :

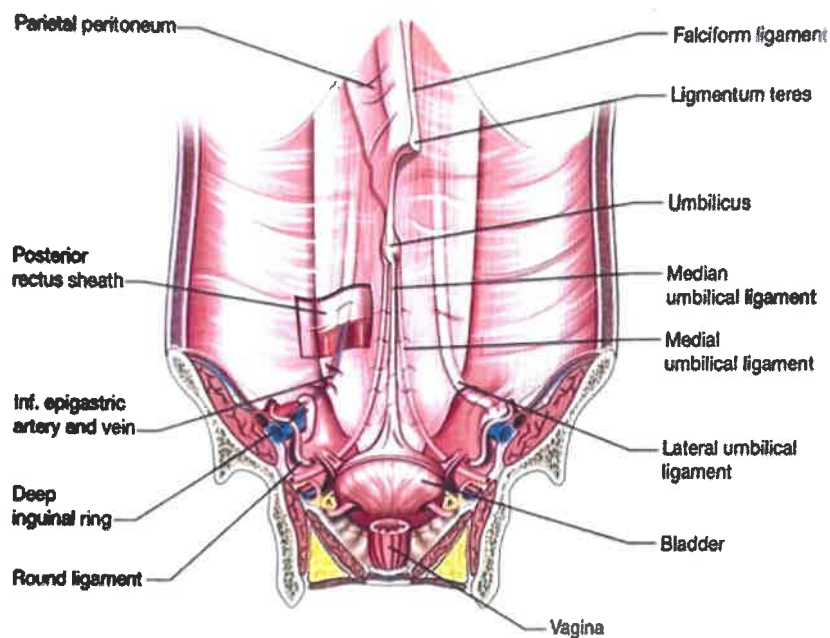
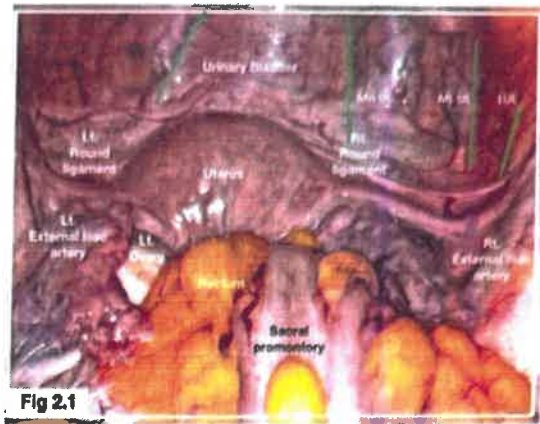
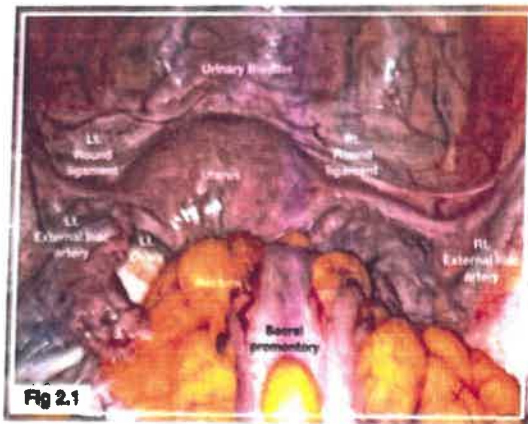
- Ilio-inguinal nerve and ilio-hypogastric nerve.
- Trauma causes paresthesia of the abdominal wall.
- Can last for months.
- morcellator site incision (15mm) is most common.
- Avoided by taking precautions while taking and extending incision for placing large ports and during specimen removal.



Nerves of the abdominal wall.

Intraperitoneal structures

00:20:46



Intraperitoneal structures.

1. median umbilical ligament :

- Remnant of embryonic urachus.
- Located in midline and connected to bladder.

2. Lateral umbilical ligament : Thin fold raised by inferior epigastric artery.

3. medial umbilical ligament :

- Formed by obliterated hypogastric artery, which is a continuation of anterior division of internal iliac artery.
- Forms the lateral limit of bladder dissection.



- | | |
|-------------------------------|---|
| A Common iliac artery | D Uterine artery |
| B External iliac artery | E Superior mesenteric artery
Collateral umbilical artery |
| C Obturator vessels and nerve | F Ureter |

Retroperitoneal structures.

TAP Block

00:25:00

- TAP block : Transverses abdominis plane block.
- Regional anesthesia for lap Sx.
- marking point : midway point between ASIS and subcostal margin on the mid-axillary line.
- Long acting local anesthetic used : Sensorcaine or Ropivacaine.
- Procedure : under USG guidens/laparoscopicalit → 20 ml of anesthetic solution injected in the abdominal wall → Needle pushed till the subperitoneal space.

LAPAROSCOPIC MYOMECTOMY

Introduction

00:00:21

Laparoscopic myomectomy has become the **gold standard** for management of fibroids.

This is because it is associated with reduced postoperative pain, faster recovery and no increase in recurrence risk compared to laparotomy.

Patient selection criteria :

1. Fibroid size : maximum diameter of 8 to 10 cm as an upper safety limit.
2. Number : 1 solitary large fibroid is easier to manage than multiple average sized fibroids.
3. Location :
 - Fibroid placed on the fundus, anterior or posterior wall of the uterus is easier to operate.
 - Fibroid located in the lateral wall, broad ligament or cervix requires additional expertise.
4. Surgeon skill : Even very large fibroids can be successfully managed in the hands of an expert.
5. Patient fitness : Along with the general pre-anesthetic workup, other co-morbidities like morbid obesity, previous surgeries, compromised cardiopulmonary function should be carefully assessed.

Consent and preoperative preparation :

- Patient is counselled thoroughly regarding the surgical procedure of laparoscopic myomectomy, its risks and advantages over laparotomy.
- Possibility of **blood loss** and need for transfusion of blood and blood products.
- Possibility of **endometrial damage** while removing a large or submucosal fibroid and chances of adhesions.
- Postponement of attempt of pregnancy during the healing period (About 3 to 6 months).
- Risk of **sarcomatous changes** in fibroid, **parasitic myomas** due to morcellation (Rare) should be documented in the consent.

Steps of laparoscopic myomectomy

00:08:16

1. Port Placement.
2. Devascularising the fibroid by :
 - uterine artery ligation.
 - Injecting vasopressin.
3. Incision & enucleation of fibroid.
4. Suturing of the myoma bed in layers.
5. **Extraction of myoma** : Extra step not present in laparotomy.
6. Placement of adhesion barrier.

Trocar placement :

00:09:53

Primary port placement :

Umbilical or supra-umbilical.

10 mm in size.

Umbilical port is chosen because :

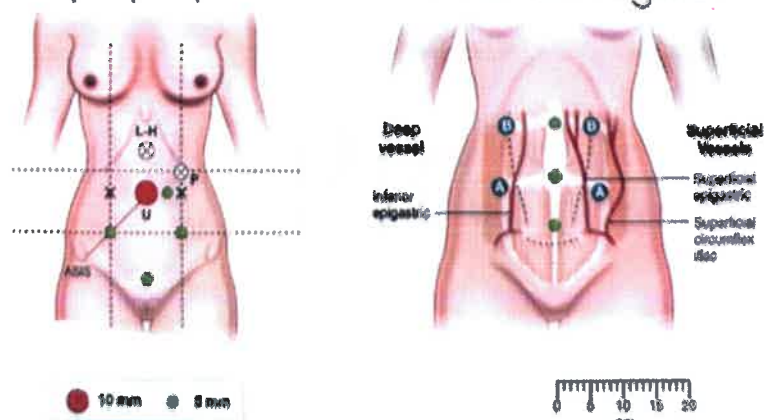
- Umbilicus is the thinnest point of abdominal wall, allows easy entry.
- Cosmetic.

Supraumbilical primary entry (Lee Huang Point) : For large fibroids.

Accessory ports :

5 mm in size

- 1st port (Left lateral port) : At junction of lateral 1/3rd and medial 2/3rd of spinoumbilical line (Line joining anterior superior iliac spine to umbilicus).
- 2nd port (Left upper port) : 10 cm above and 2 cm medial to the lower port in case of ipsilateral surgeons.
- 3rd port (Right lower port) : Usually a mirror image of the left lower.
- Diamond shaped port placement : For contralateral surgeons.



Trocar placement.