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Trocar insertion in obese PCOS pt



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Introduction

- Laparoscopy is a very common procedure in gynaecology.
- Access to the abdomen is the one challenge of laparoscopic surgery.
- It was noted that **complications** of laparoscopic surgery are **mostly entry related** and independent on complexity of surgery .

Introduction

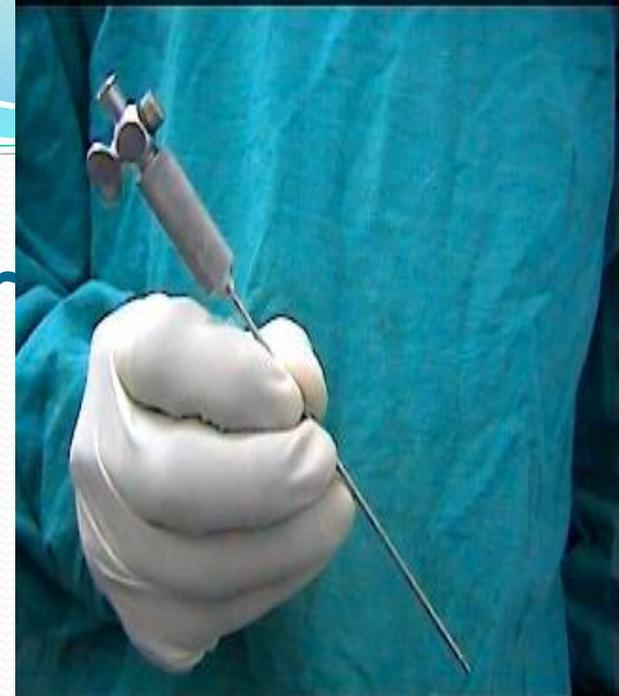
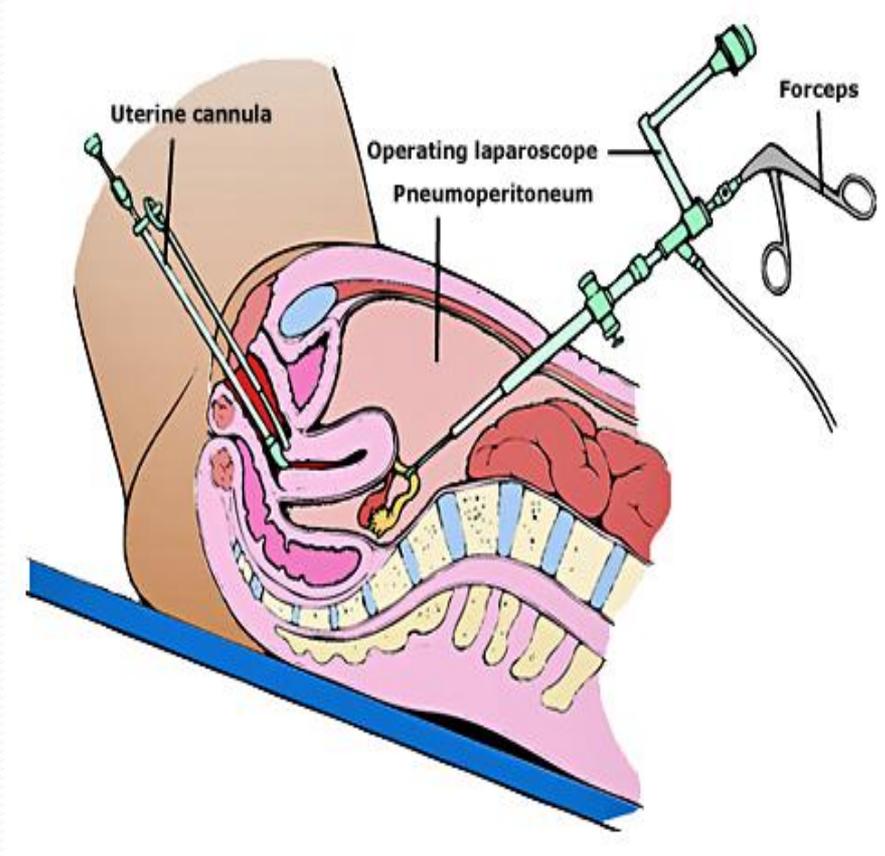
- **To minimize entry related injuries, several techniques, instruments, and approaches have been introduced.**
- **The life-threatening complications include injury to the bowel, bladder, major abdominal vessels, and anterior abdominal-wall vessel.**

Introduction

- Other less serious complications can also occur, such as post-operative infection, subcutaneous emphysema and extraperitoneal insufflation.
- Laparoscopic procedures are **minimal invasive surgically** but **not minimally invasive physiologically**.

Laparoscopic Entry

Access is the Key of Success



Laparoscopic Entry

Access is the Key of Success

Entry into the peritoneal cavity is the most dangerous part of the procedure

Be careful...be careful...be careful...

Laparoscopic Entry

A. Closed access

* Blind

Insufflated Veress Needle Entry(1932)

Non-insufflated *Direct Trocar Entry*(1978)

* Visual

Optical Trocar insertion(1994)

Laparoscopic Entry

B- Open access

- **Hasson Technique 1978**
- **Radially Expanding Access System (1996)**
- **Visual Entry Systems**
 - Disposable Optical Trocars**
 - Endopath Optiview optical Trocar**
 - Visiport optical trocars**
 - EndoTIP visual cannula**

Veress Needle Entry

Sites of Veress Needle Entry

1-Trans-umbilical :

Intra-umbilical

Sub or supra umbilical (smiling incision)

11-Extraumbilical

1-Trans-umbilical :

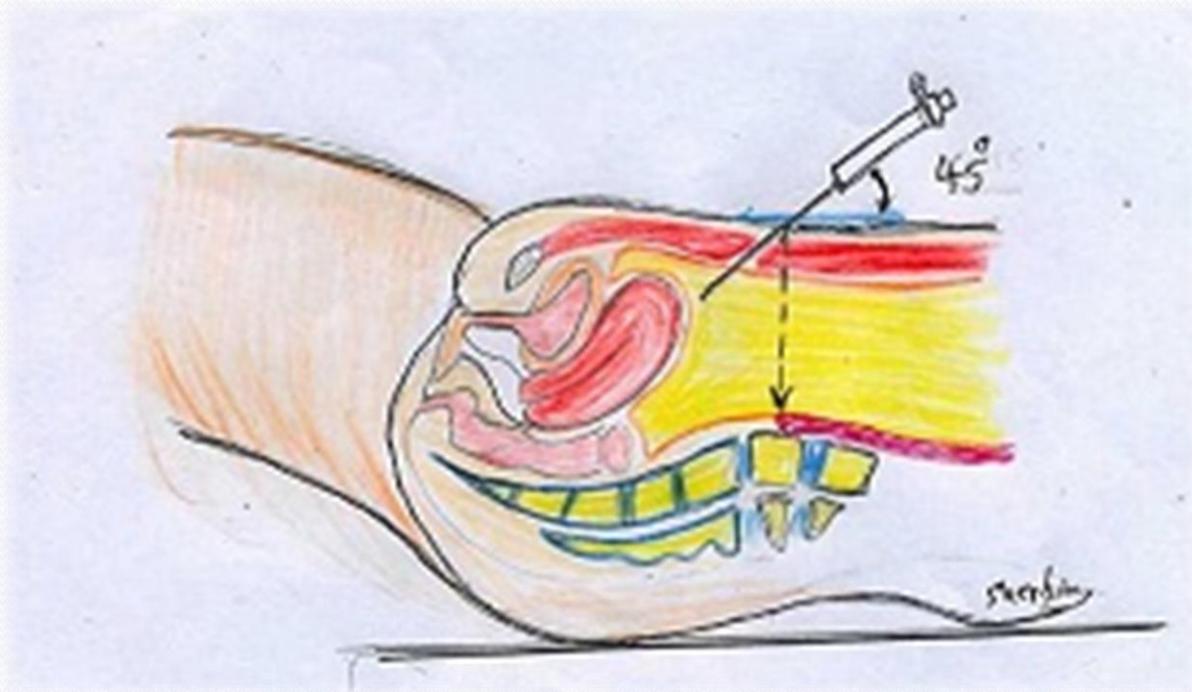
Veress needle insertion

- Towards uterus*
- Away from vessels*
- angle 45*

Society of Obstetricians and Gynecologists of Canada 2007.

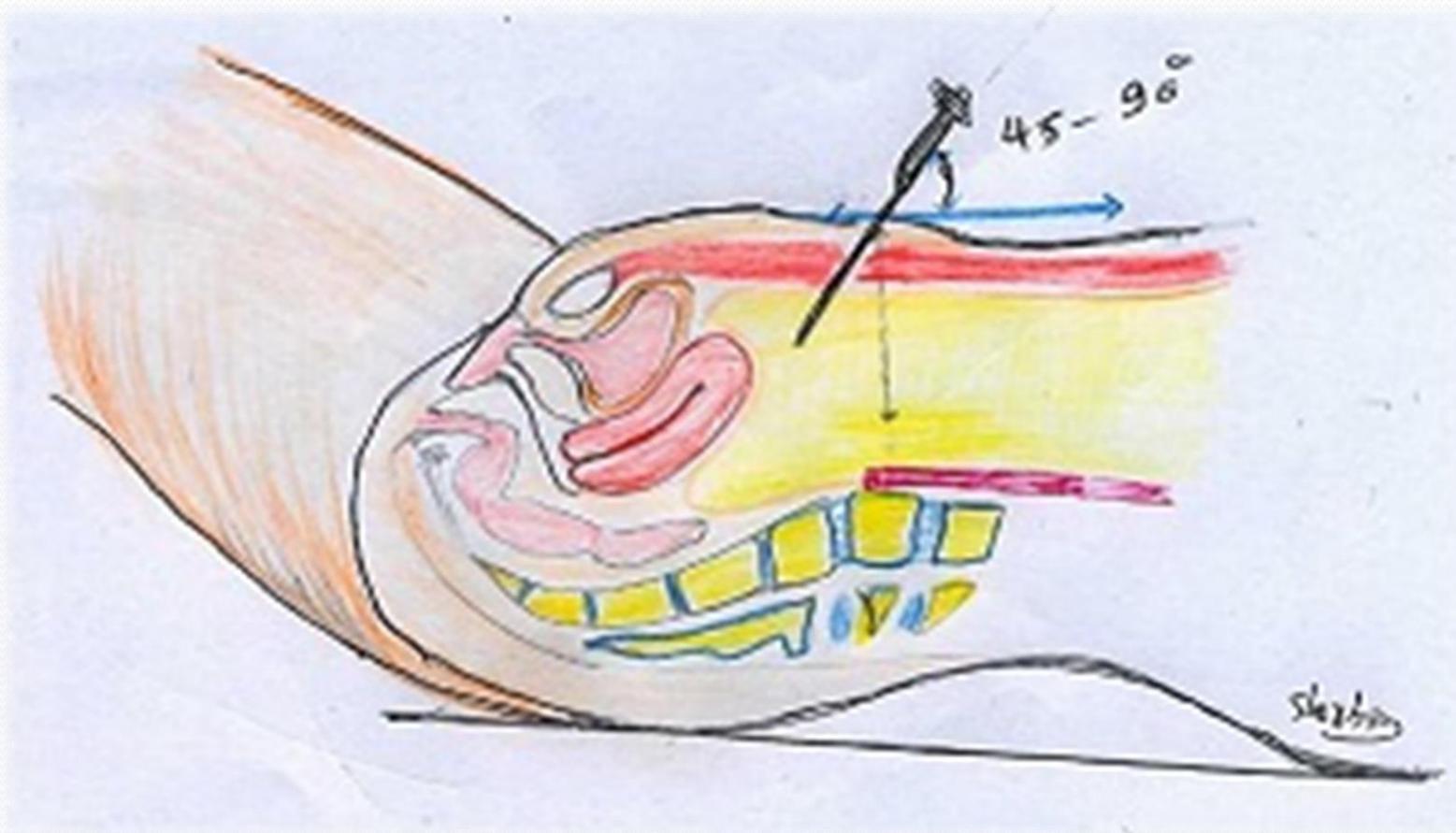
- The angle of the **Veress needle insertion** should vary according to the BMI of the patient, from 45 in non-obese women to 90 in obese women. (II-2 B)

Normal : BMI < 25 use angle < 45°

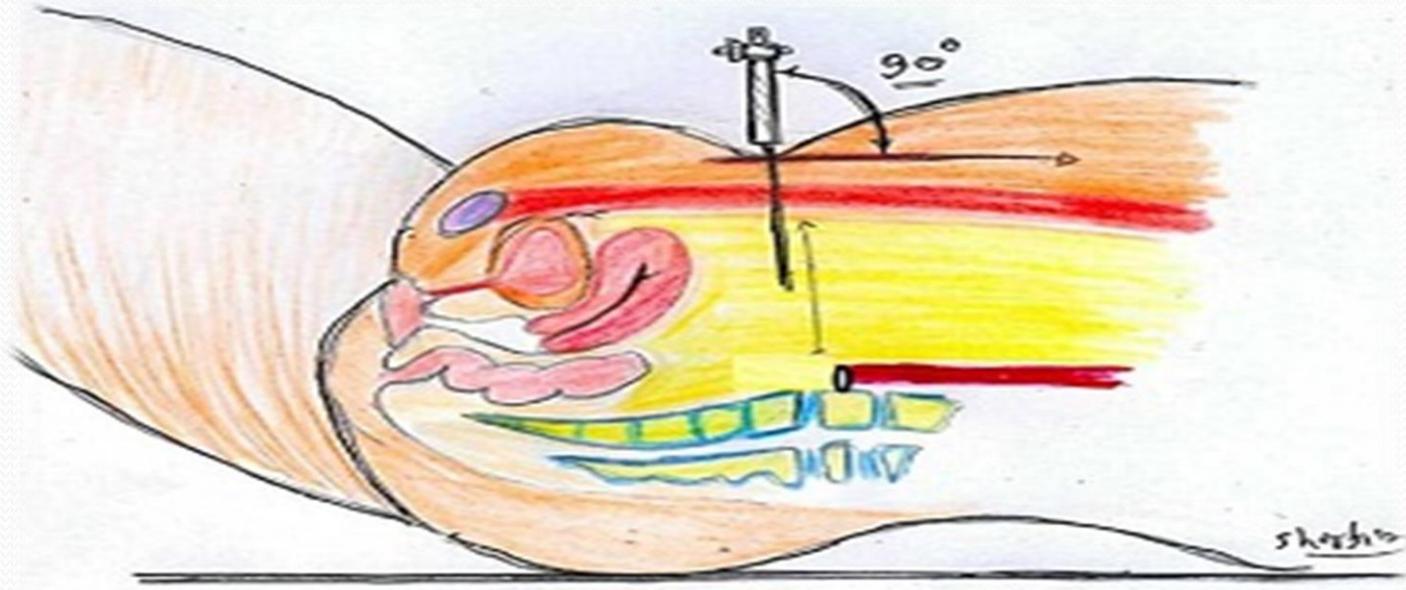


Non obese Mean location of the umbilicus was 0.4 cm caudal to the aortic bifurcation

Overweight BMI 25-30 use angle 45° - 90°

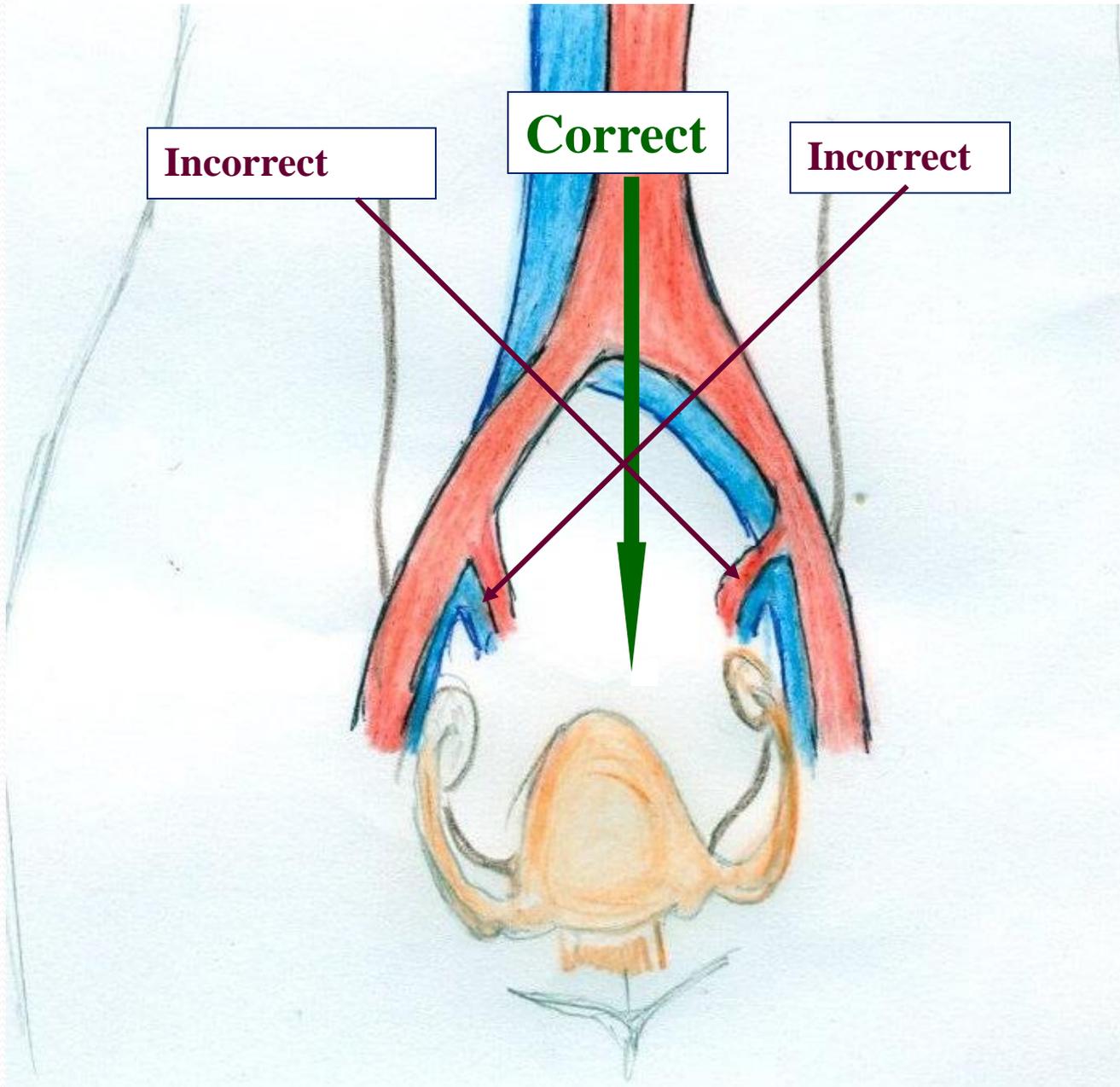


Obese: BMI >30 use angle 90°



Obese Mean umbilical location was 2.4 cm caudal to the bifurcation

Midsagittal Plane Insertion



Veress needle safety tests

(Tests for peritoneal entry)

- The “hiss” sound test
- Double click sound of the Veress needle
- Irrigation test (the syringe test.)
- Aspiration test (Palmer test)
- Hanging drop of saline test
- Insufflation pressure
- Needle movement (wiggling)

Society of Obstetricians and Gynecologists of Canada 2007.

The Veress intraperitoneal (VIP-pressure **10 mm Hg**) is a reliable indicator of correct intraperitoneal placement of the Veres needle; therefore, it is appropriate to attach the CO₂ source to the Veress needle on entry. (II-1 A)

Number of Veress needle insertions attempts

- Complication rates were as follows:

one attempt, 0.8% to 16.3%; at

2 attempts, 16.31% to 37.5%;

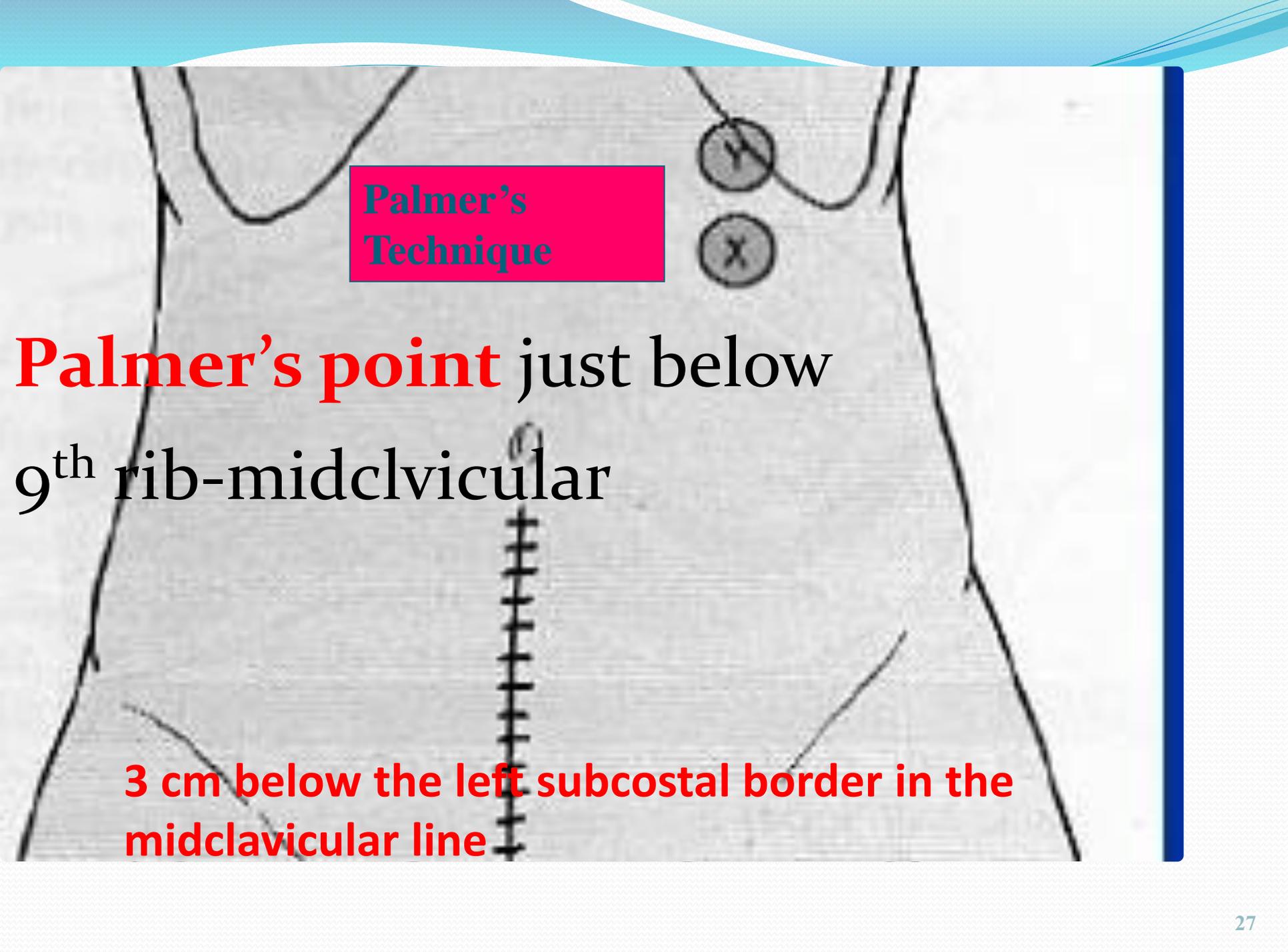
3 attempts, 44.4% to 64%;

**More than 3 attempts, 84.6%
to 100%.**

- Complications were extraperitoneal insufflation, omental and bowel injuries, and failed laparoscopy.

Extraumbilical

1. Left upper quadrant (LUQ,)
Palmer's point
Ninth or tenth intercostal space
2. Transuterine Veress CO2 insufflation
3. Trans cul-de-sac CO2
insufflation(Transvaginal)

An anatomical diagram of the human torso, showing the rib cage and midclavicular line. A vertical line with tick marks represents the midclavicular line. A red box highlights the text 'Palmer's Technique'. The text 'Palmer's point just below 9th rib-midclavicular' is written in red and black. The text '3 cm below the left subcostal border in the midclavicular line' is written in red. The diagram shows the rib cage and the midclavicular line. A vertical line with tick marks represents the midclavicular line. A red box highlights the text 'Palmer's Technique'. The text 'Palmer's point just below 9th rib-midclavicular' is written in red and black. The text '3 cm below the left subcostal border in the midclavicular line' is written in red.

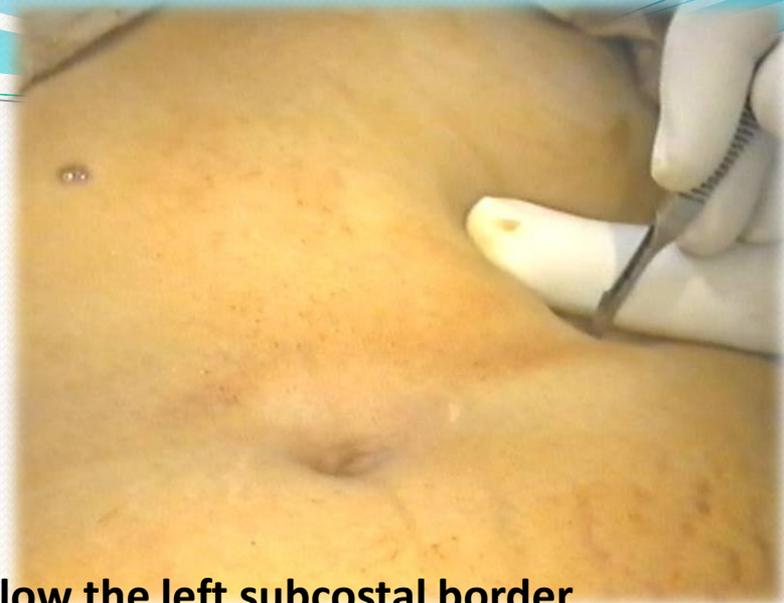
**Palmer's
Technique**

Palmer's point just below
9th rib-midclavicular

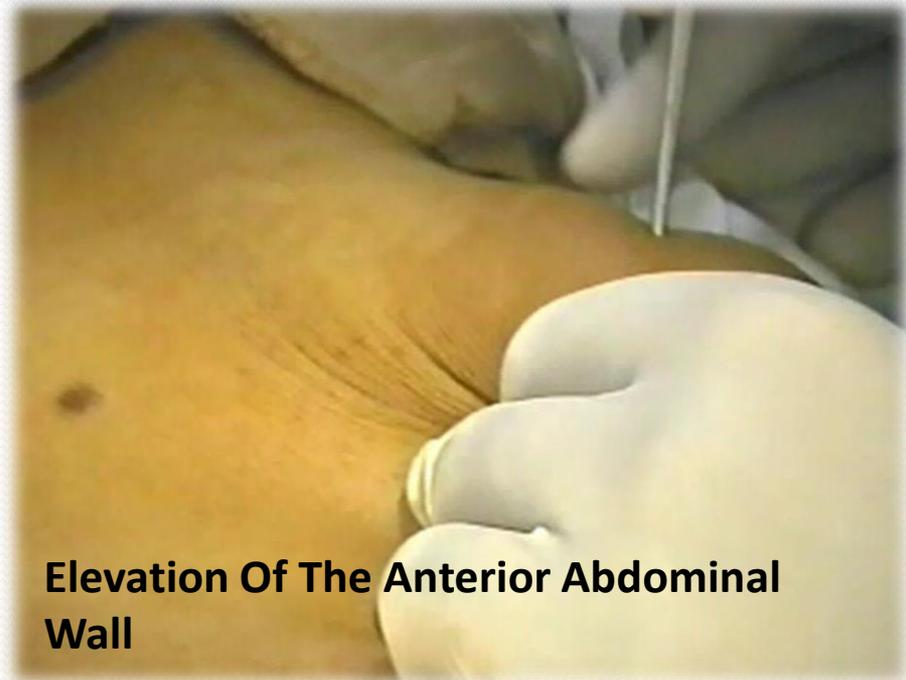
**3 cm below the left subcostal border in the
midclavicular line**

LUQ, Palmer's point

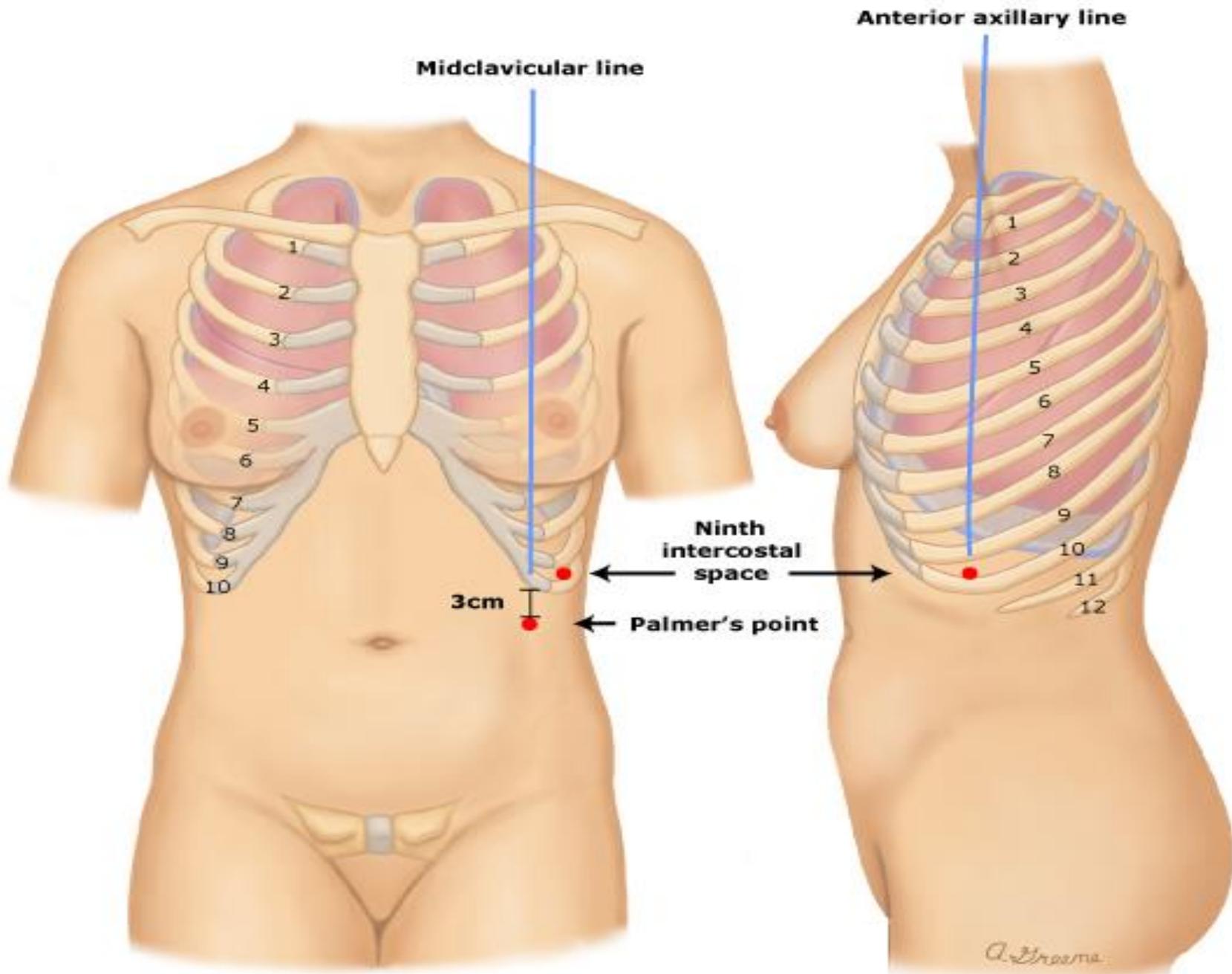
Veress Needle Insertion



3 cm below the left subcostal border



Elevation Of The Anterior Abdominal Wall



Left Upper Quadrant (LUQ, Palmer's) Laparoscopic Entry

Prerequisites:

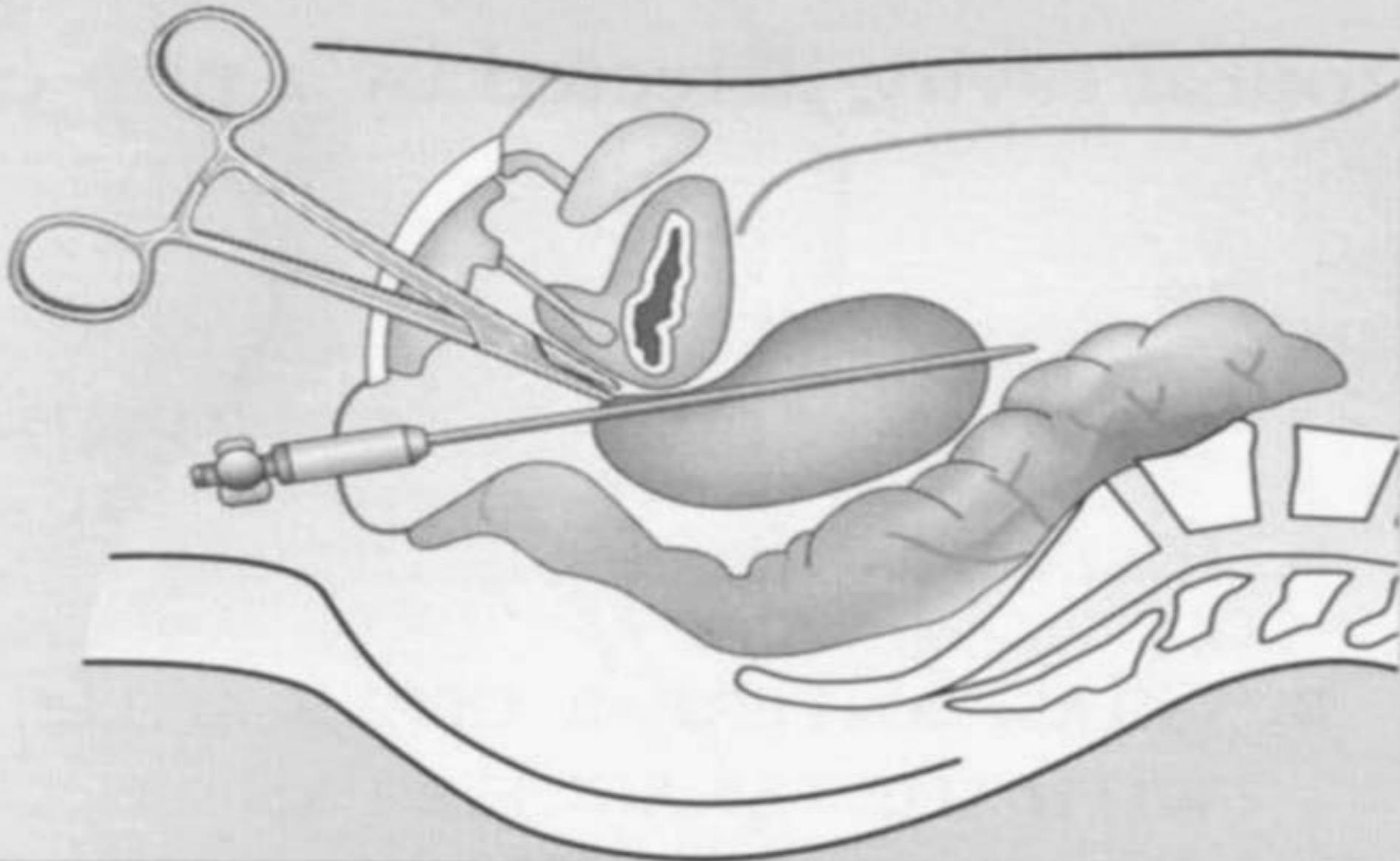
- ✚ Emptying of the stomach by nasogastric suction
- ✚ No previous splenic or gastric surgery
- ✚ No significant hepatosplenomegaly
- ✚ No portal hypertension
- ✚ No gastropancreatic masses

Left Upper Quadrant (LUQ, Palmer's) Laparoscopic Entry

It should be considered in patients with:

- ✚ Suspected or known periumbilical adhesions**
- ✚ History or presence of umbilical hernia**
- ✚ After three failed insufflation attempts at the umbilicus.**

(SOGC Practice Guideline.193, 2007) (L:II-2 G:A)



Transfundal insertion



Trocar Entry

Conventional trocar and cannula

- **VALVES**
trap-door (trumpet)
flapper valve
- **SIZE 5,9,10mm.**
PRIMARY
SECONDARY
- **Tips**
pyramidal or conical
tip



TROCARS

Conventional Trocar and Cannula



Pyramidal



Conical
(Sharp)



Conical
(Blunt)



Blunt
(Hasson)

C958HN8A-04

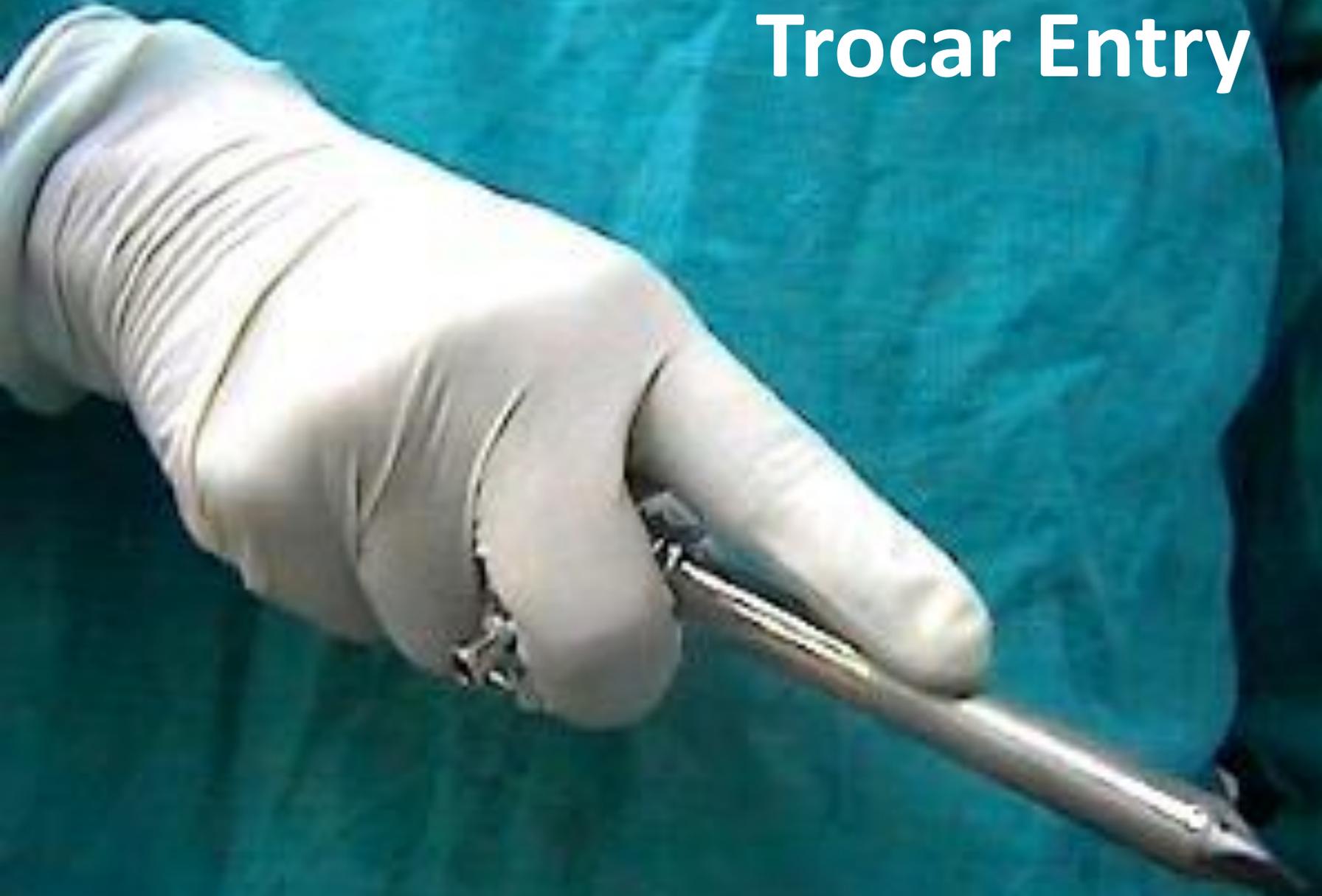
Trocar Entry

1-Primary trocar

- With pneumoperitoneum (conventional)VNE
- Without pneumoperitoneum (DTE)

2-Secondary trocars

Trocar Entry



Laparoscopic Pearls

Primary ports

- ❑ 45° angle of entry
- ❑ Stay midline
- ❑ Keep patient flat
- **If the same angle of insertion is used in the Trendelenburg position, the trocar may be directed at the great vessels**

Optical access trocars

- i. **Visiport** uses a blade that strikes the fascia and peritoneum under laparoscopic guidance.

- ii. **Optiview** uses a conical clear tip that is rotated under laparoscopic vision as it penetrates the fascia and peritoneum

Trocar Entry

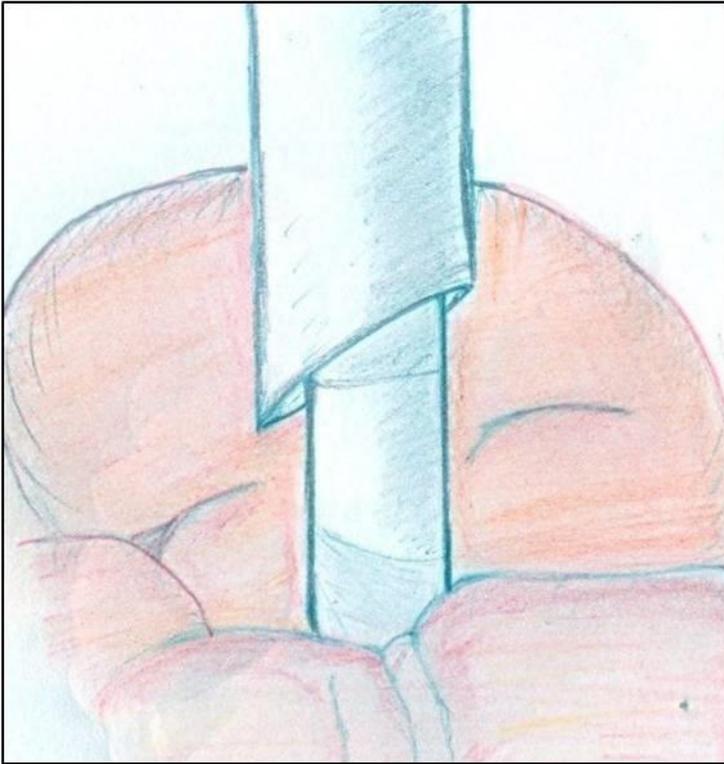
- **Low pressure entry $\leq 15\text{mmHg}$**
- **High pressure entry**

High pressure trocar entry

- Temporary higher inflation **pressure (25-30mmHg)**
- The use of transient HIP-Entry does not adversely affect cardiopulmonary function in healthy women.
- **↑ separation between viscera and anterior abdominal wall**
- **May therefore reduce risk of injury**

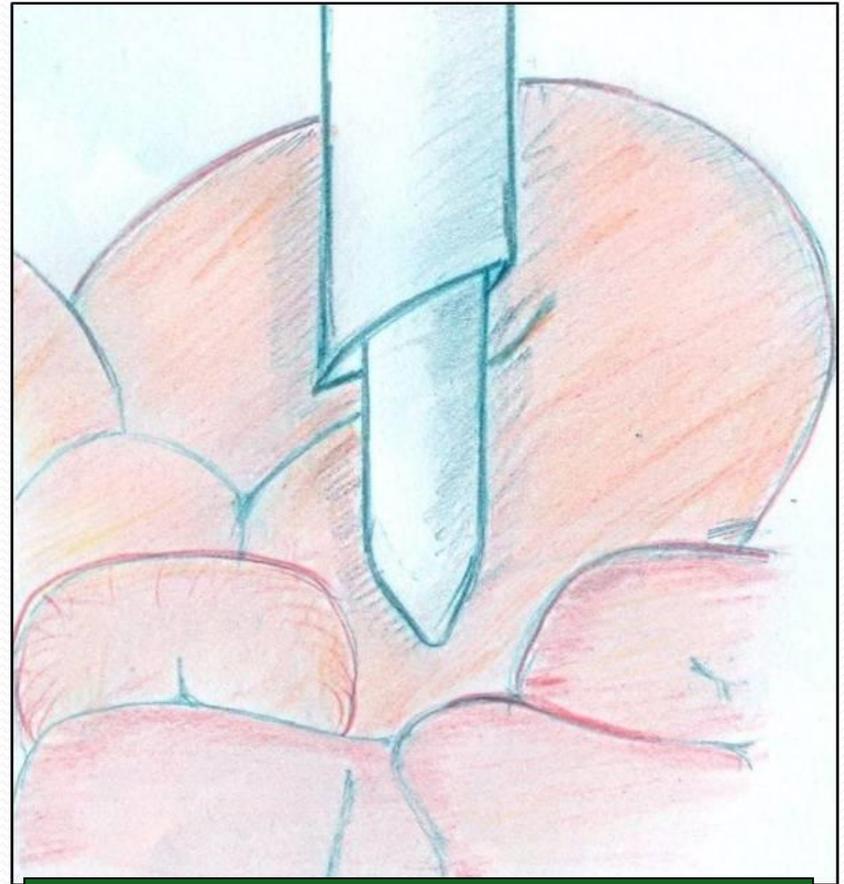
The High Pressure Entry

14 mm Hg



The tip of the trocar can injure
.abdominal contents

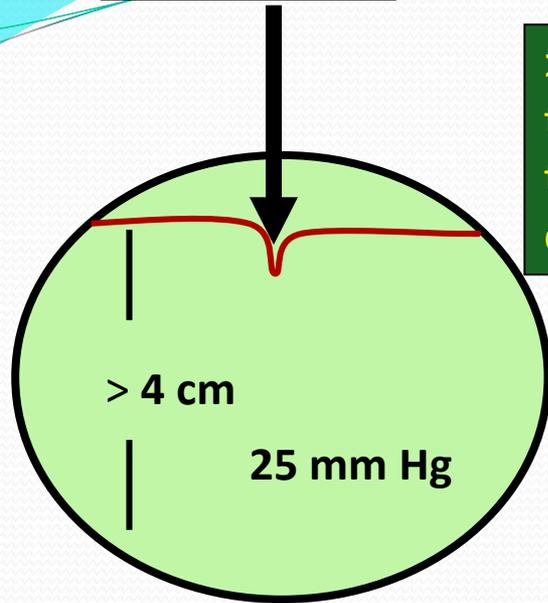
20 -30mm Hg



The tip of the trocar is away from
abdominal contents.

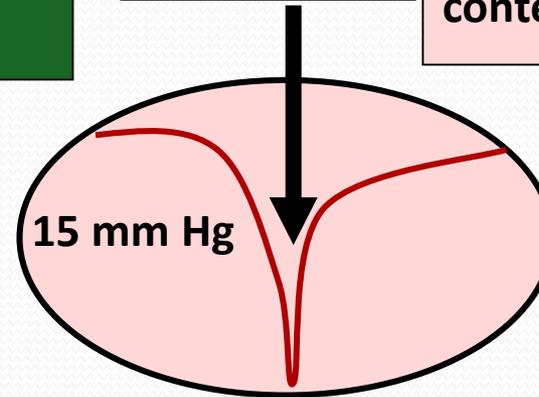
The High Pressure Entry

3 kg force



> 4 cm maintained. the tip of the trocar never touched abdominal contents.

3 kg force



The tip of the trocar touched abdominal contents

Phillips et al Gynaecol Endosc 1999;8:369-74.

Trocar insertion requires
4 to 6 kg of force

Tarney et al . Obstet Gynecol 1999;94:83-8.

So the pressure of 25-30 mmHg is required

Direct Trocar Entry(DTE)

Without pneumoperitoneum

The advantages of direct trocar

- The **avoidance of complications** related to the use of the Veress needle as failed pneumoperitoneum, preperitoneal insufflation, intestinal insufflation, or the more serious CO₂ embolism
- Faster than any other method of entry.
- Immediate recognition and rapid treatment of complications.

Successful Direct Trocar Entry

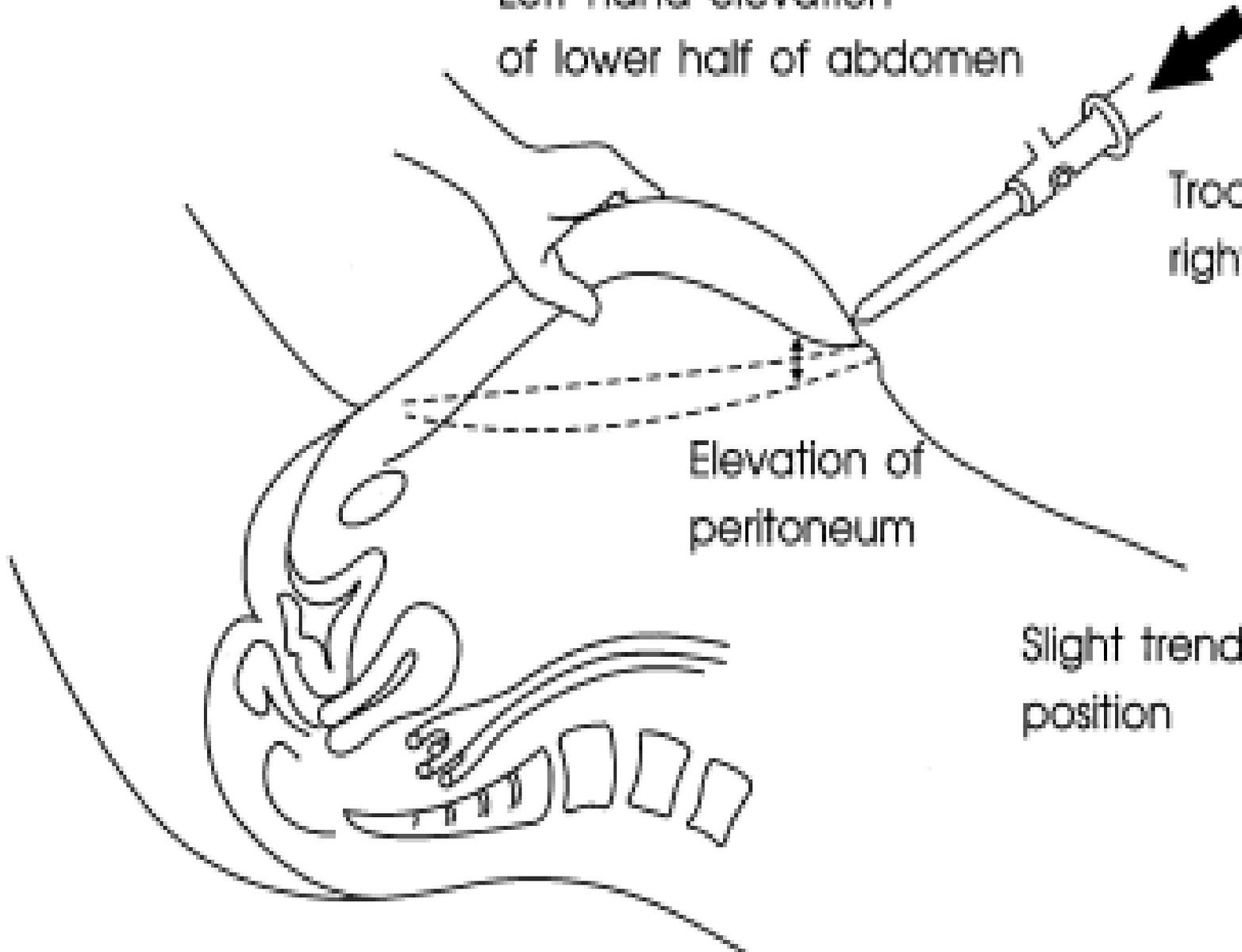
- **Relaxation:** Adequate General anesthésia
- **Sharp Trocar:** the sharper = safer
- **Adequate Incision**
- **Elevation of the abdominal wall** (not necessary)

Left hand elevation
of lower half of abdomen

Trocar thrust
right hand

Elevation of
peritoneum

Slight trendelenberg
position



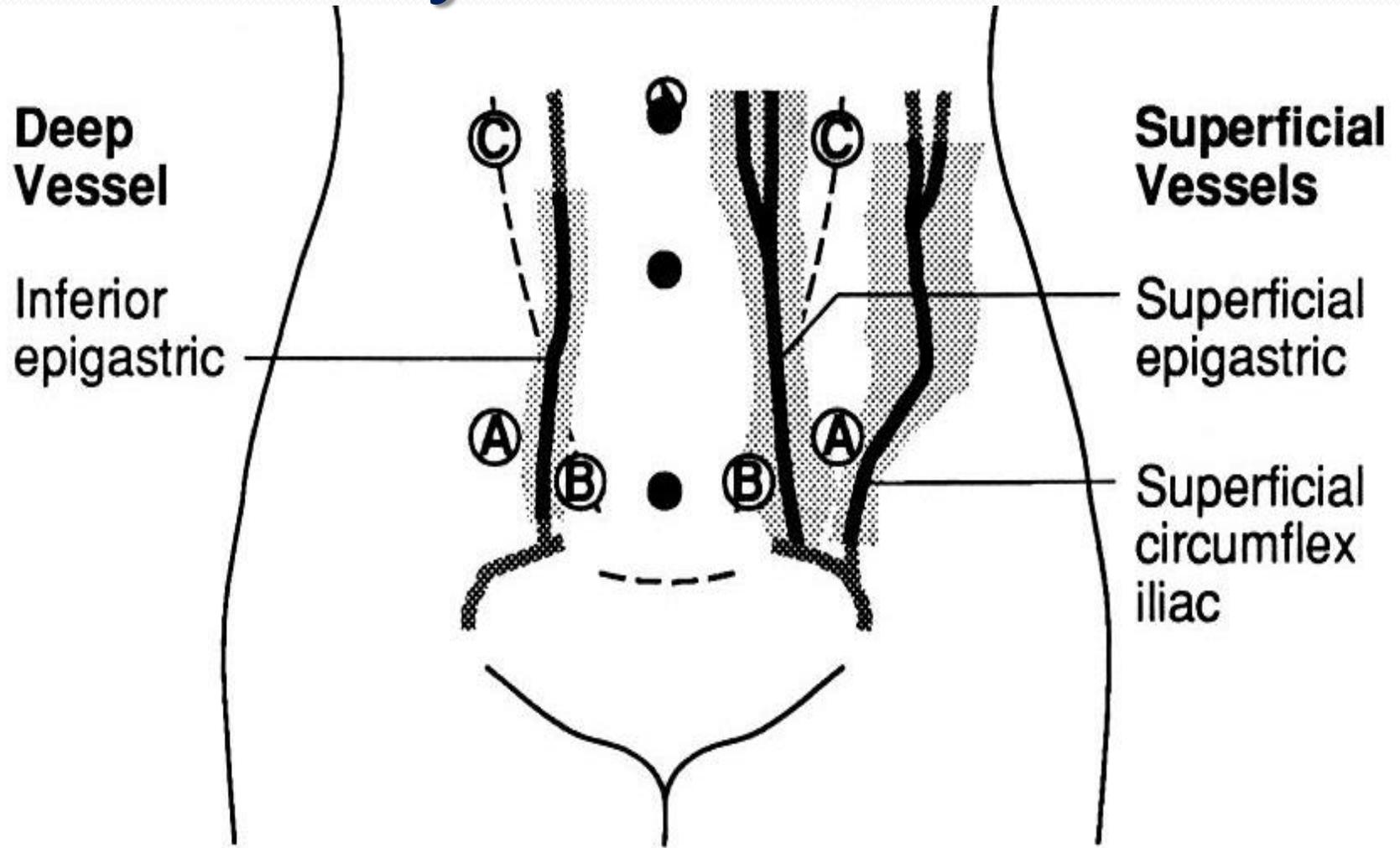
Direct Trocar versus Veress Needle Entry for Laparoscopy: A Randomized Clinical Trial

Mahmoud S. Zakherah

Department of Obstetrics and Gynecology, Women's Health Centre, Assiut University, Assiut, Egypt

In conclusion, DT entry is a safe alternative to the VN entry technique for the creation of pneumoperitoneum. Such an approach has further advantages such as less instrumentation, rapid creation of pneumoperitoneum, less CO₂ use, and fewer minor complications.

Secondary trocars



How Should Secondary Ports be Inserted?

- **The secondary trocar should be placed in a well-controlled fashion under direct visualization**
- **A suprapubic trocar**
- **Lateral lower pelvic ports**

Transillumination of the abdominal wall will often identify these superficial vessels and aid in trocar placement. These trocars should be placed under direct visualization

How Should Secondary Ports be Inserted?

Secondary ports must be inserted under **direct vision** perpendicular to the skin, while maintaining the pneumoperitoneum at **20–25 mmHg**

RCOG Guideline No. 49 May 2008

How Should Secondary Ports be Inserted?

During insertion of secondary ports, the inferior epigastric vessels should be visualised laparoscopically to ensure the entry point is away from the vessels

RCOG Guideline No. 49 May 2008



Open Laparoscopic Entry

(Hasson Technique)

- **Particularly useful in previous abdominal surgery or underlying adhesions**

Laparoscopic surgery in the obese women

- Obesity changes the relationship of the **umbilicus to the aortic bifurcation**.
- In nonobese patients (BMI <25), the umbilicus had a median location **0.4** cm caudal to the bifurcation,

In overweight (BMI 25 to 30) and obese (BMI >30) patients, the umbilicus had a median location **2.4 and 2.9** cm caudal to the aortic bifurcation, respectively.

Laparoscopic surgery in very thin woman

- Liable to more complications
- **The Hasson technique or insertion at Palmer's point is recommended for the primary entry in women who are very thin and women with morbid obesity**

RCOG Guideline No. 49 May 2008 Grade C

Aim

Safe Entry

Safe Laparoscopy

Risk of herniation

Hernias at the site of laparoscopic ports are significantly more common with 12-mm trocars.

Close fascia, therefore, when you've used any type of trocar that is 10 mm or greater in diameter.

Chiong et al .. 2010;75(3):574-580.

Release of gas Completely

Evacuate all gas and instruct the anesthesiologist to perform five manual inflations of the lungs before the patient is taken out of Trendelenburg position.

- *Phelps P, et al .Obstet Gynecol. 2008;111(5):1155-1160.*

Arm tucking

Avoid brachial plexus injury in laparoscopic surgery by always tucking the arms, instead of placing them on arm boards that can inadvertently be moved beyond horizontal during the surgery.

- *Shveiky et al .. 2010;17(4):414-420.*

DVT

- Protection against DTV should be employed specially in an obese patient and for a surgery beyond 1 hour

Elastic stockings

Pneumatic compressors

High risk cases LMH in consultation with physician

Take Home Message

- Obesity is a high risk situation for laparoscopy
- All aspects of surgery: difficult anaesthesia, DVT, false pneumo, vascular trauma, long duration of surgery, port issues are enhanced
- Longer instruments are needed
- The angle of insertion of veress & trocar need to be changed



Thank You