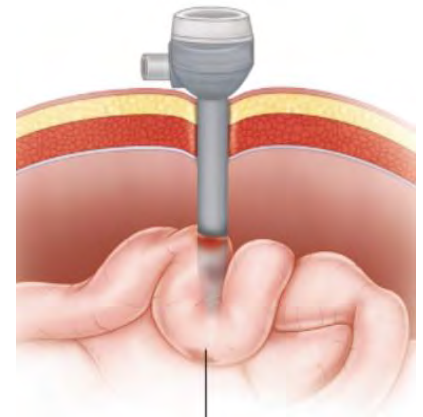
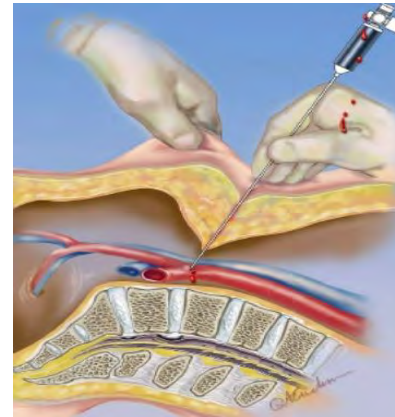


**How to make appropriate entry for
pneumoperitoneum during minimally
invasive surgery?**

조혁진 (가톨릭의대)

Entry-related complications

- Approximately **50%** of serious laparoscopic complications
- **Overall incidence entry injuries** : 3.3 per 1000 cases
- **Gastrointestinal injury** : 0.4 -1.3 per 1000 cases
- **Major vascular injury** : 0.2 -1.05 per 1000 cases



Establishment of pneumoperitoneum

- Retroperitoneal
- Transperitoneal
- Closed Access (Veress Needle)
- Open Access (Hasson)
- Direct trocar entry

Which of the various access methods was the safest and/or most effective ?

Review Article

Complications Related to the Initial Trocar Insertion of 3 Different Techniques: A Systematic Review and Meta-analysis



Laparoscopic entry techniques (Review)

No clear evidence to recommend one technique over another.

Cochrane Database Syst Rev. 2019

J Minim Invasive Gynecol. 2019; 26(1):63-70

Creating the pneumoperitoneum

Transperitoneal Access

Closed technique

Open technique

Retroperitoneal Access

Closed Technique

Veress needle technique

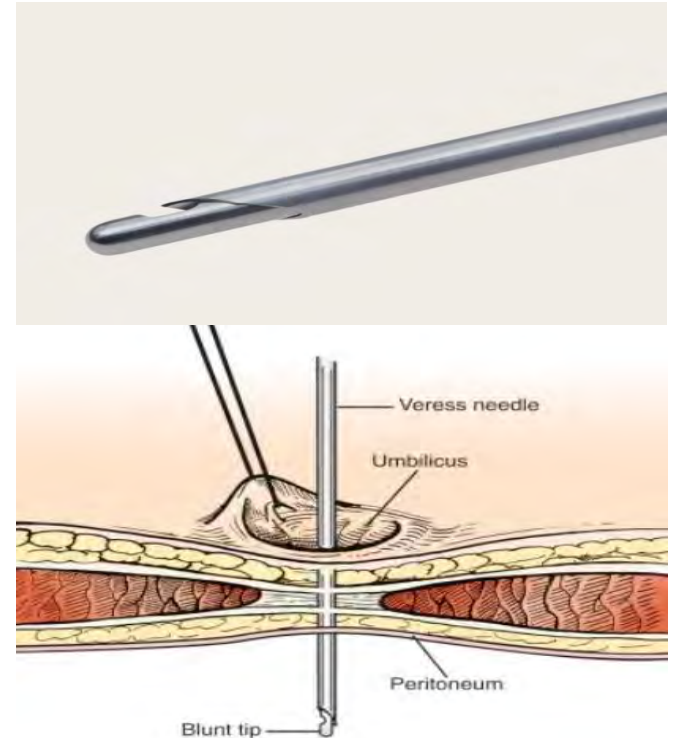
14-gauge needle, 12 to 15 cm in length

Two “pops”

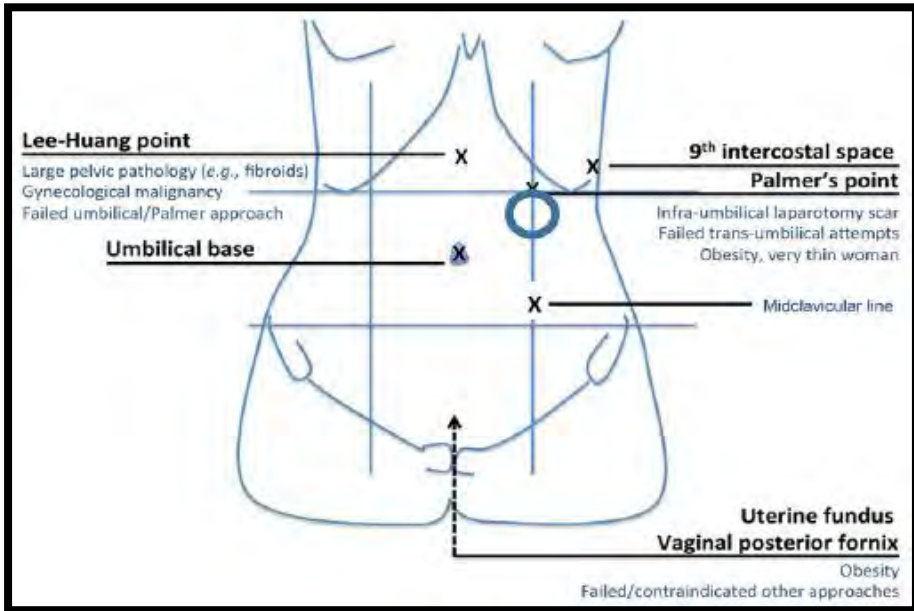
Aspiration, injection, reaspiration, and drop test

Initial intraperitoneal **pressure of <10 mmHg**

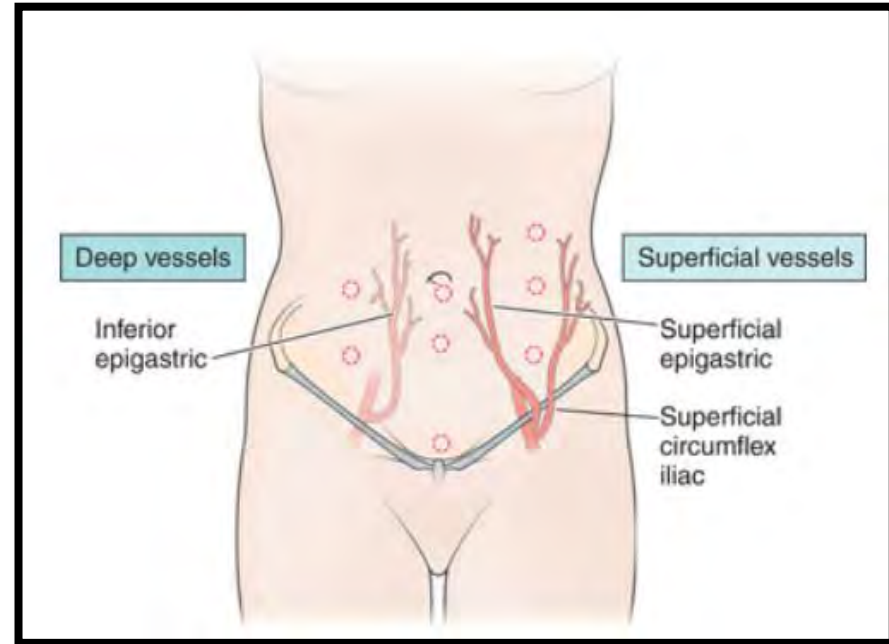
Before trocar insertion : **pressure of 20–30 mmHg** rather than by CO2 volume



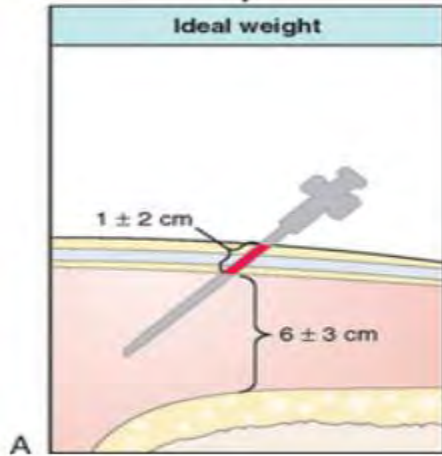
Veress needle insertion sites



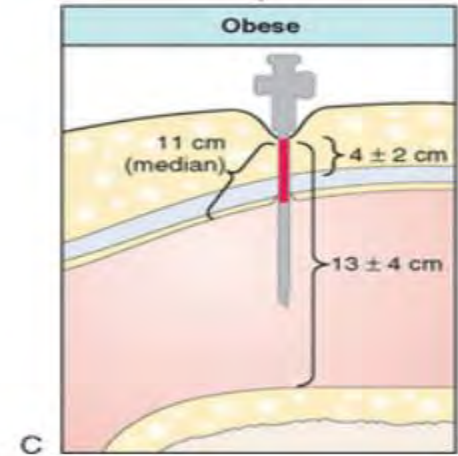
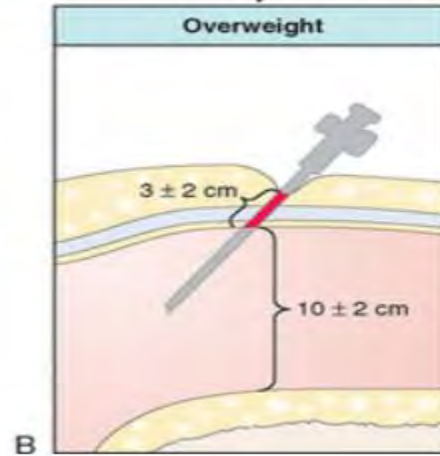
Superficial or deep vessels of anterior abdominal wall



Veress insertion angles



45-degree angle



90-degree angle



Number of insertion attempts

Placing the Veress needle into the peritoneal cavity

First attempt 85.5-86.9%

Two attempts 8.5-11.6%

Three attempts in 2.6-3.0%

More than three attempts in 0.3-1.6%

Complication rates

One attempt 0.8-16.3%

Two attempts 16.31-37.5%

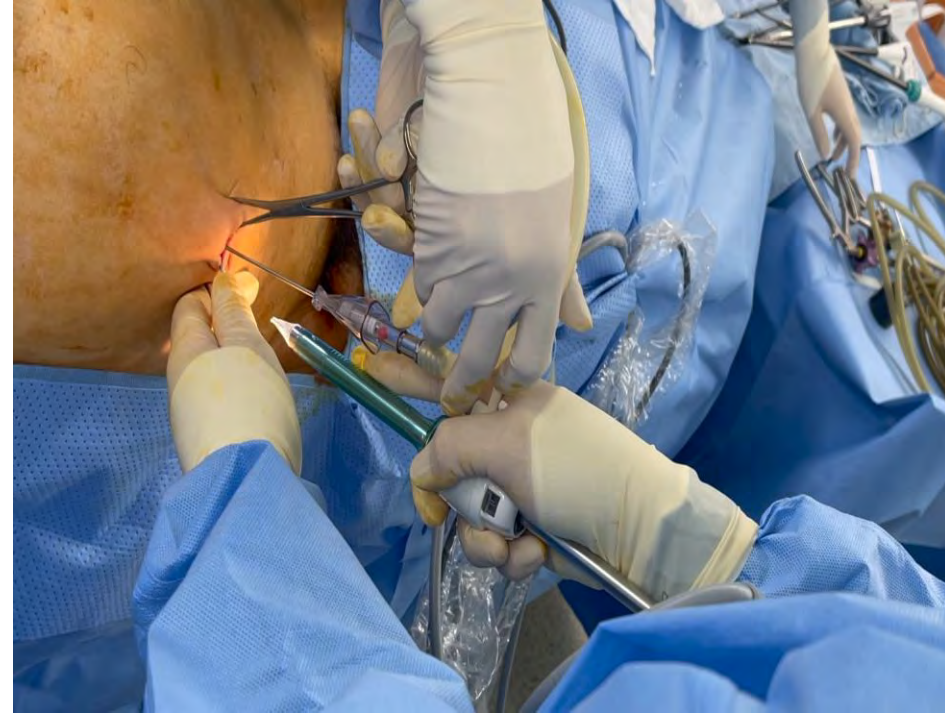
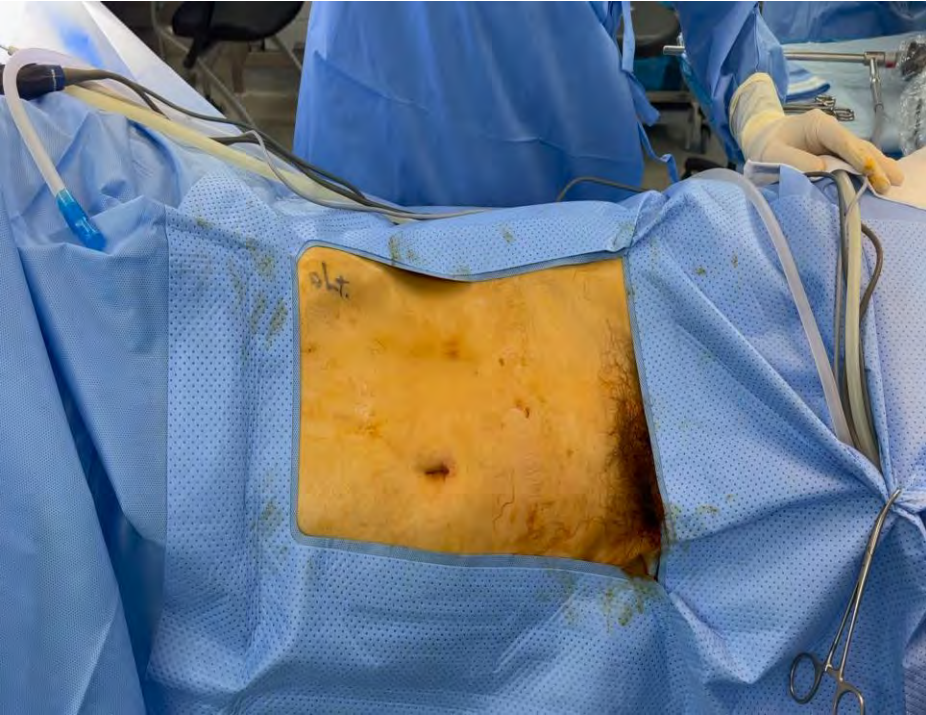
Three attempts 44.4-64%

More than three attempts 84.6-100%.

Closed technique: robot-assisted radical prostatectomy



Closed technique: robot-assisted nephroureterectomy



Open Entry (Hasson) Technique

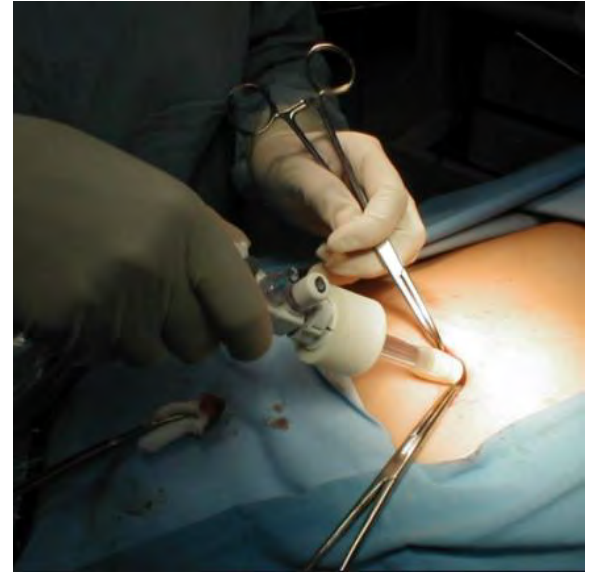
Incision is made through the abdominal wall under direct vision

Patient with suspected abdominal adhesions

Veress needle insertion fails

Neither superior nor inferior to other entry techniques

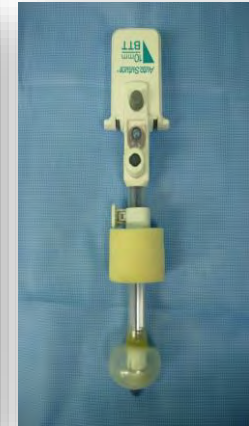
Lower incidence of vascular injuries but a potentially higher incidence of bowel injury



Open Entry Technique

The steps of the Hasson technique are as follows:

- A skin incision
- The subcutaneous tissues are bluntly separated
- The fascia is incised
- The peritoneum is grasped and incised sharply
- The surgeon's finger is used to confirm bowel safety
- Trocar is placed through the incision
- The pneumoperitoneum is established through the port



Open (Hasson) technique: radical nephrectomy



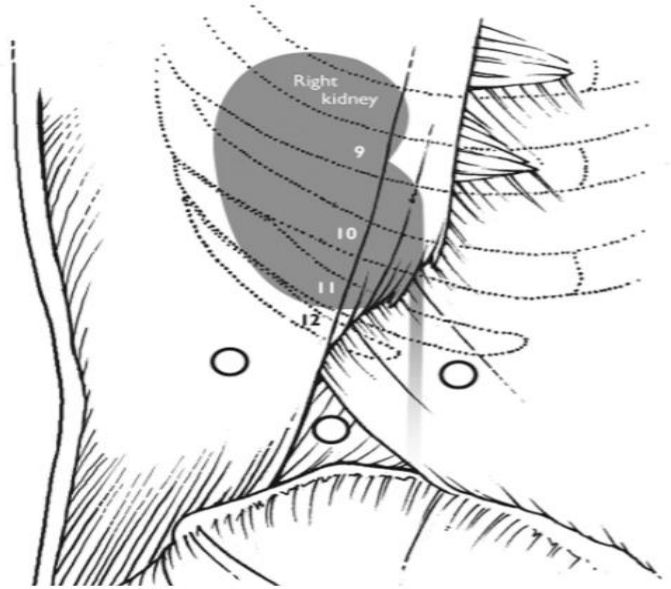
Open (Hasson) technique: Laparoendoscopic Single Site (LESS) Surgery



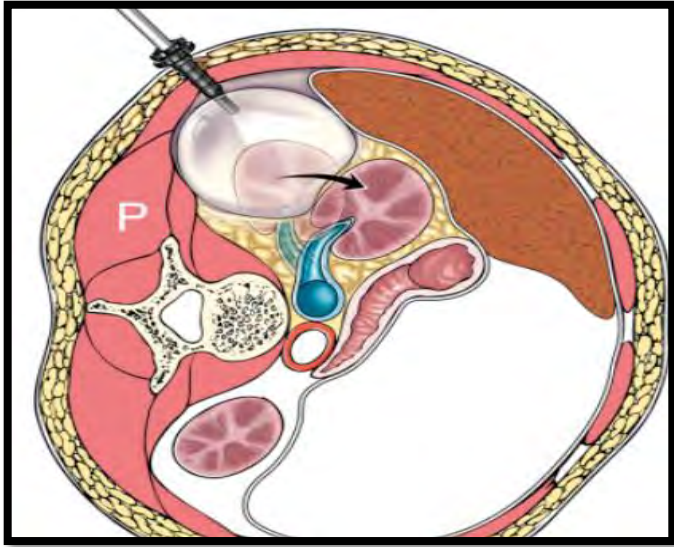
Retroperitoneal Access

- small working space
- lack of easily recognized anatomic landmarks
- little need for retraction or mobilization of adjacent organs
- earlier return of bowel function and shorter convalescence

Retroperitoneal Access



Retroperitoneal Access

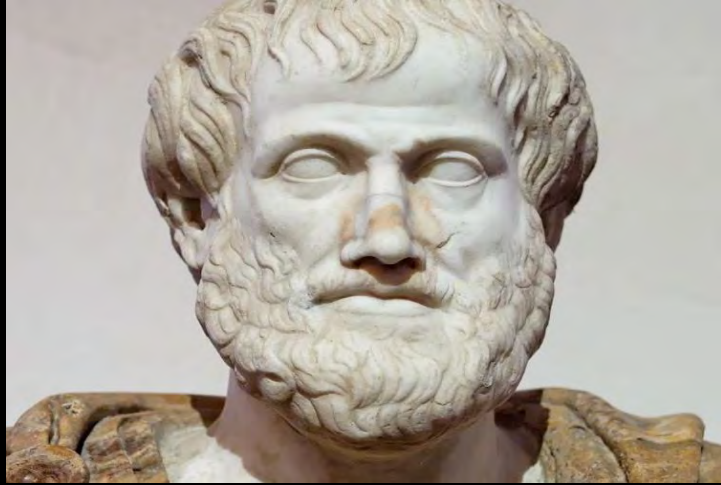


Retroperitoneal access



Conclusion

- Laparoscopic abdominal entry is the **most dangerous** part of any laparoscopic procedure
- There is **no single** safe technique that reduces laparoscopic surgery entry complications
- Surgeon should select the technique which he feels most comfortable
- Surgeons should be comfortable with a range of entry techniques and locations



“Well begun
is half done”

-aristotle-