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# Use of Lee Huang point for safe and rapid entry in various laparoscopic gynecological operations

Hossam Mahmoud[1], Wael Ahmed Ezzat Ammar [1], Sherif M. Safwat [2], Marwa R. Shahine[1], Diaa Abdelhalim[2]

[1]Fellow obstetrics and gynecology at El Galaa Teaching Hospital, Cairo, Egypt
[2]Associate consultant obstetrics and gynecology at El Galaa Teaching Hospital, Cairo, Egypt
Email: dr.waela3@gmail.com

**Abstract:** Introduction: Using non umbilical routes for safe abdominal entry during laparoscopic surgery has become mandatory The left upper abdomen (Palmer's point), the middle upper abdomen (the Lee-Huang point), Jain point and left upper quadrant especially could be used especially in high risk patients with possible periumbilical adhesions, a history of umbilical hernia or after failed repeated attempts of insufflation through the umbilicus. Aim of study: To evaluate the use of Lee-Huang point for safe and rapid entry in various laparoscopic gynecological operations. Patients and methods: This prospective study was done at El Galaa teaching hospital in the period from September 2024 to September 2025 upon 100 patients undergoing laparoscopy using Lee-Huang point as the primary point of insertion. Results: In 97% of patients, surgery was performed without any complications to viscera or major vessels. One stomach injury and two omental injuries were encountered during needle/trocar insertion in 3 patients. There was no mortality reported. Conclusion: Lee-Huang point is a safe and reliable access site for gynecological laparoscopic surgery in appropriately selected patients.
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## 1. Introduction:

Laparoscopic surgery in gynecology has brought a wide range of advantages. Laparoscopic surgeries were found 41% safer than traditional laparotomy. (1)

Overall complications of laparoscopies are 0.8% versus 15% for laparotomy. Although catastrophic complications are very low 0.5%, mortality ranges between 8% and 17%. More than 50% of the complications occur during the abdominal entry step. Hazardous complications include alimentary tract (0.7/1000) and vascular injuries affecting major blood vessel injuries (0.4/1000). Although several entry techniques exist, there is no clear consensus on the optimal method of entry to the peritoneal cavity. (2-4).

Palmer point is a laparoscopic entry at left upper abdomen described by Raoul Palmer, which is located 3cm below the costal margin in midclavicular line. It may be useful for patients with large pelvic masses, failed umbilical entry, previous midline abdominal incisions and it may also be used for very thin or obese patients. Contraindications to this approach include hepatosplenomegaly, gastropancreatic masses, and gastric and splenic surgeries (2, 5).

Jain point is another lateral abdominal entry point described by Nutin Jain for primary trocar entry. It is present at the level of umbilicus 2.5 cm medial to anterior superior iliac spine (ASIS). It is valuable especially if the midline is not safe or feasible. Jain et al. (6) reported minimal complications, it is not universally adopted or studied, like other non-umbilical entry points.

Left upper quadrant is located at the height of the dome of lower margin of the left subcostal region . It is another useful way for safe entry and establishing pneumoperitoneum in high risk patients such as ,those with high BMI, gynecological cancer , large pelvic masses and possible intraperitoneal adhesions. Despite safety has not been confirmed, this entry point provides several merits over others. It was applicable in 442 laparoscopies regardless the patient characteristics, such as age, BMI, previous surgeries and operative indications. However , this surgical landmark still has some limitations. Hepatosplenomegaly, past history of gastric or splenic surgery and large gastropancreatic masses should be considered as contraindications to it (2, 7).

The middle of upper abdomen or Lee-Huang point (it is located midistance between the xiphoid process and the umbilicus) is a novel laparoscopic entry point with many advantages for operative

laparoscopy, particularly in patients with large pelvic masses and gynecologic cancers. It provides a wider abdominal cavity access, better visual angle, and increased working distance (8-14).

Potential complications include injury to major vessels (aorta, superior epigastric vessels). Although the risk is lower than a Palmer's point, still present, particularly if insertion is poorly angled or too deep. Omental and bowel injuries are less common than periumbilical insertion due to previous upper abdominal surgery. Failed entry or preperitoneal insufflation may occur, if the needle or trocar is not properly angulated or inserted into the peritoneal cavity. Difficult insertion at this point can occur especially if the abdominal wall is thick in obese patients. Herniation or port site complications can occur if port more than 10 mm is not properly closed. Diaphragmatic irritation, injury and pneumothorax rarely occur if needle is placed too cephalad or angled incorrectly particularly with high intraperitoneal pressure. Injury to liver and stomach may occur, especially in the presence of hepatomegaly and gastric dilatation if nasogastric decompression was not done preoperatively (15).

Consequently, the above mentioned different new laparoscopic entry points could be considered safe non-umbilical routes in those high risk patients (2, 8-11, 12, 14).

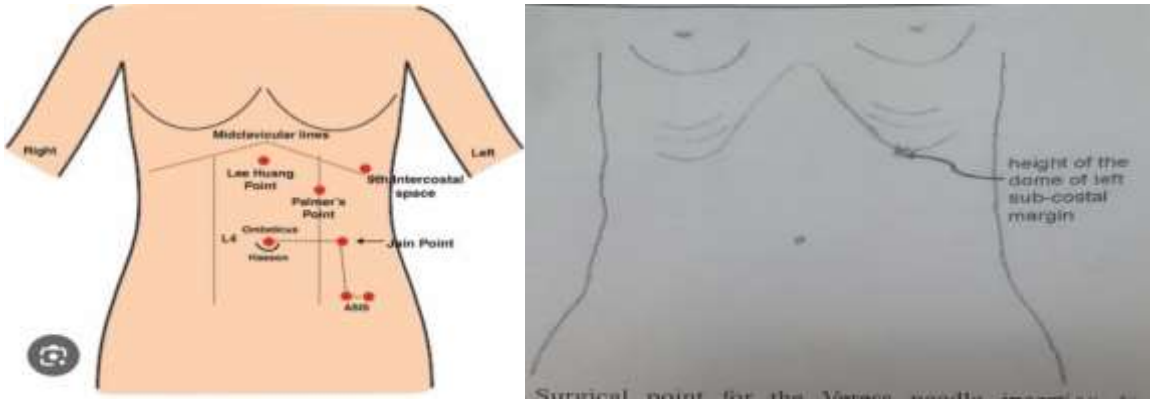


Figure (1): Entry points in laparoscope

**Aim of study:**

To evaluate the use of Lee-Huang point for safe and rapid entry in various laparoscopic gynecological operations.

**2. Patients and methods:**

This prospective study was done at El Galaa teaching hospital in the period from September 2024 to September 2025 upon patients undergoing laparoscopy using Lee-Huang point as a primary site of insertion as an alternative to routine abdominal entry for laparoscopy who are at high risk of injury due to previous multiple abdominal surgeries, obesity, large pelviabdominal masses, suspected periumbilical adhesions or after failed repeated three umbilical entry trials. All patients unfit for anesthesia or surgery and those with hepatosplenomegaly and intestinal obstruction were excluded from the study.

Here are precautions and measures taken when using Lee Haung point for laparoscopic entry:

1- History and proper patient selection

Patients suitable for the study are those with previous midline or lower abdominal surgeries where umbilical adhesions are expected. Caution was taken with those with upper abdominal surgeries with possible adhesions around Lee Huang point.

2-preoperative imaging:

Ultrasound or MRI can be used to help to assess for adhesions, organ position and hernias

3- Proper positioning

Dorsal lithotomy position was chosen to reduce the risk of injury during entry.

4-Skin and abdominal wall preparation

We marked the exact site of Lee- Haung Point and used appropriate skin antiseptics preparation.

5-Entry technique.

**Veress Needle insufflation and primary trocar insertion technique:**

We inserted the veress needle 45-90 angle toward the pelvis. We confirmed correct placement by (Drop test, low initial intraabdominal pressure less than 10 mmHg, aspiration, saline flush free high flow of the gas). The angle of insertion should differ according to BMI (45 degrees in normal BMI to 90 degrees in high BMI women). Insufflation slowly at 20-25 mmHg to reduce the vascular injury hazard and do not intervening with the pulmonary and

cardiac functions. Removal of the needle was followed by primary trocar insertion. In some cases, we found that trying to lift the anterior abdominal wall by hand or using an Allis forceps at time of primary trocar insertion could be helpful but should not be done in every case ,because it does not prevent the risk of visceral or vessel injury. Thereafter, the proper position of the trocar must be reviewed by introducing the laparoscope and checking the abdominal and pelvic cavities. (Nasogastric tube was inserted to decompress stomach before starting the insertion of the veress needle).

7- Once inside, performing a 360-degree inspection to rule out injury. Check for hemorrhage, bowel injury, omental injury or adhesion avulsion.

8- Backup plan

Converting to open surgery or choosing an alternative entry site (e.g. palmer point) if entry at Lee Huang point was not achieved and the case was excluded from the study.

9- Ensuring adequate fascial closure at the end of the operation. Lee Huang point was evaluated regarding complications (vascular, visceral, omental and conversion to laparotomy due to issues concerned with difficulty to entry using Lee-Huang point).

**3. Results:**

100 patients underwent laparoscopy using Lee-Huang point entry technique from September 2024 to September 2025.The mean age was 36.56 ± 10.38. The mean BMI was 26.6 ± 2.24. Seventy-nine percent of patients had previous surgeries. The previous surgeries included 17 laparoscopies while 62 cases had previous open surgeries. The previous surgeries included 74 patients with transverse scar and only 5 cases with vertical sub umbilical scar. Laparoscopy was indicated for infertility evaluation (51%), chronic pelvic pain (9%), endometriosis (6%), hysterectomy (11%), myomectomy (7%) and ovarian tumors (16%). In all surgeries, the insufflation needle and primary trocar port were inserted via this new middle upper abdomen entry point (Lee-Huang point LHP). In 97% of patients, surgery was performed without any major complications of vessels or visceral injury, and no mortality reported. One stomach injury and two omental injuries were encountered (during needle/trocar insertion), Two cases out of 100 were converted to laparotomy for reasons apart from abdominal entry (one due to uncontrolled bleeding during operation and the other due to extensive pelvic adhesions). Very few minor complications happened, preperitoneal inflation in two patients, one omental insufflation that resorved spontaneously without intervention. No immediate or delayed postoperative complications were reported. Patients left the hospital after 24-72 hours and checked up one week later. No feedback of any delayed health problems or port site complications has been reported to date.

**4. Discussion:**

Major complications in laparoscopy include major vessels injury and visceral injuries (0.13%) during entry that increase the morbidity and mortality of patients. Percentages of umbilical adhesions vary from 0% to 1.5% with previous laparoscopic surgery and from 20 to 28% with horizontal suprapubic incisions and 50% to 60% with longitudinal incision.

The rate of complication increases with repeated umbilical entry. It has been reported to be 0.8-16% at one attempt, 16.3-37.5% at two attempts, 44.4%-64% at three attempts and 84.6-100% after more than three trials. Complications include subcutaneous emphysema, omental insufflation, viscus injuries and cancelled laparoscopy. As complications increase dramatically with repeated trials, other entry points should be considered (such as palmer point, Lee-Huang, Jain, left upper quadrant). If continued failed attempts or contraindicated changing to open insertion technique or optical access. Till now, no method or site of insufflation and portal entry has shown to be more advantageous than one another. Practically, they are selected according to the surgeon's discern, and patient condition.

The next most familiar site for insertion of a verres needle is palmer point. It has proved safe and has a low failure rate of about 1.5%. This point is used in patients with very low or high BMI or patients with a history of previous midline scars or large pelvic lesions or possible periumbilical adhesions or failed insufflation. However, Palmer point has its limitations like splenomegaly, portal hypertension and gastro-pancreatic masses. Injury to bloated stomach is a very occurring fallacy but the true incidence could be grossly underreported.

Left upper quadrant, at the height dome of lower subcostal margin provides another safe alternative to umbilicus entry particularly in obese patients, large pelvic lesions, gynecological cancer, previous abdominal incisions and suspected intraperitoneal adhesions. Although safety is not yet confirmed, this entry point is superior over other entry points and was successful in 442 laparoscopies regardless of patient's patterns **(7)**.

Agrawal et al. (16) reported that needle insertion and insufflation in the left upper quadrant at the height of dome of lower margin of subcostal region is another safe non umbilical entry point. Two complications were reported, one gastric and one hepatic injury in a review of 918 patients. In another study where 267 patients were reviewed

retrospectively, who had the same entry point , only three cases of left liver lobe puncture occurred and managed conservatively. Failure of insufflation occured in 1.5% of cases (17).

Jain point is found on a vertical line drawn 2.5cm medial to anterior superior iliac spine (ASIS) at the level of umbilicus, so this point is very easy to detect and accurate. It can be used if palmer's point is not applicable or if the clinical situation calls for. Sharp (18) suggested that Jain point has more advantages over Palmer point as it is lower and more lateral in position to and acts as the main working port during surgery.

Hasson, et al (19) open technique which involves incising skin , subcutaneous tissue and the abdominal sheath followed by inserting the port cannula or a blunt trocar under vision and lastly establishing the pneumoperitoneum .Although , this technique has been shown to reduce the risk of major vascular injury, but the risk of viscus injuries remained unchanged (especially type2where a bowel loop may be densely adherent to the abdominal wall especially with midline incisions). Postoperative complications such as wound infection and incisional umbilical hernia may occur more with open technique than other entry points due to a relatively larger port size (20).

Our study is another trial to provide a newer technique of entry especially in high-risk patients. The study describes our experience with Lee-Huang point in 100 patients. The Lee-Huang point represents midway between the xiphoid process and umbilicus it is used as an entry point for the veress needle and primary laparoscopy port. In 97 out of 100 lap of patients (97%), laparoscopic surgery was performed without complications. Only two omental injuries and one stomach injury have occurred during insertion of the needle/trocar. As for omental injuries, there was minimal bleeding which did not need bipolar coagulation and subsided on its own. The injury to stomach was superficial affecting the serosal layer without any visible leakage or considerable bleeding. This was due to improper nasogastric tube insertion to decompress the bloated stomach. The injury was inspected throughout the procedure and patient was put under observation and monitored closely postoperatively and discharged from hospital 24 hours later.

Fig (2): Serosal injury to the dilated stomach during direct trocar entry at Lee-Huang point

Only two cases were converted to laparotomy due to issues rather than abdominal entry by veress or primary port (uncontrolled bleeding during myomectomy and hysterectomy operations). Our results came in accordance to a study published by Lee et al. (12). They used this point for veress needle and primary port insertion in 188 high risk patients who with suspected subumbilical adhesions as result of previous abdominal incisions or because of presence of gynecological cancer. 98.4% (184 out of 188) of patients had no complications and no one of the laparoscopies was converted to a laparotomy. Two omental injuries from primary port insertion were coagulated with bipolar and one colon injury needed repair using laparoscopic stitches. Lee et al. (12) concluded that Lee-Huang point is effective for patients with previous abdominal surgeries or gynecologic malignancy. The reasons for using this technique are

(1) It avoids and overcomes possible adhesions that may result from prior low midline incisions and overcrowed operative space caused by huge

uterus. It overcomes the robotic bulky arms of Da Vinci while allowing proper view and working space for large pelvic masses and gynecological cancers.

(2) It provides a better central vision of operative field. Central vision is more important than lateral one for the surgeon to have easy access to both sides of pelvis and myoma can be located in any portion of uterus.

(3) It allows a better access and view from higher position than given by laparocopies using routine umbilical route. Hence, ovaries can be repositioned with ease to a higher anterolateral point about 3-4 cm above the level of umbilical during ovarian transposition.

(4) Umbilicus migrates caudally as body mass index increases. It is present 0.4 cm distal to aortic bifurcation in nonobese women BMI < 25% versus 2.4-2.9 in overweight (BMI 25-30%) and obese (BMI > 30%). Lee-Huang point represents a more fixed landmark particularly in obese undergoing para-aortic lymphadenectomy.

(5) Lee-Huang point at avascular Linea alba avoids adhesions at umbilicus and avoids traversing abdominal muscles and consequently applying of additional force to get over resistance which could lead to inadvertant viscus and vascular injury. Relative contraindications to Lee–Huang point are supra umbilical incisions, hepatosplenomegaly, and intestinal obstruction. In case, the surgeon cannot access or there is a contraindication, alternative non-umbilical access or open insertion technique or optical (direct vision) access technique could be considered.

**Conclusion:**

Lee-Huang point is a safe and reliable access site for gynecological laparoscopic surgery in appropriately selected patients especially in patients with a history of multiple abdominal surgeries, obesity or suspected peri-umbilical adhesions when the umbilical access is not ideal. Surgeons should be acquainted with a good knowledge of anatomy and continue their laparoscopic training to reduce laparoscopic complications.

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