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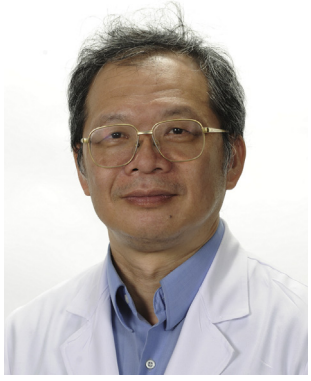
Editorial

Lee–Huang point 20 years on



In 1993, Dr Chyi-Long Lee, a gynecologic laparoscopist, and Dr Kuan-Gen Huang, a gynecologic oncologist, collaborated to advance the field of laparoscopic gynecologic oncology surgery in Taiwan. Their initial goal was to develop a technique for laparoscopic para-aortic lymph node dissection in advanced cervical cancer. At that time, the widespread laparoscopic approach to para-aortic lymphadenectomy was from caudad to cephalad. The Lee–Huang point was developed as the site for insertion of the primary trocar midway between the xiphoid process and the umbilicus. Its location provided the laparoscopist a central anatomical view compatible with the practice of head-to-foot orientation of laparoscopic surgery.[1] Since then, the application of the Lee–Huang point has expanded to various gynecologic laparoscopic surgeries.

For para-aortic node dissection in laparoscopic oncologic surgery

Multiple recent studies continue to report the adequacy and safety of laparoscopic para-aortic node dissection in gynecologic cancer. Lymph nodes are harvested from the common iliac artery, abdominal aorta, and inferior vena cava until the level of the duodenal reflection, inferior mesenteric artery, and left renal vein. In performing this advanced laparoscopic surgery, one must consider the distance between the primary trocar and the operative target. It should be wide enough to allow adequate operative view and working space without interference from surrounding organs. In the absence of previous surgery, the first trocar is traditionally inserted into the umbilicus. For patients with previous surgery, the primary trocar is placed in the left upper quadrant (Palmer's point). The disadvantage of umbilical entry is the limitation of the operative view as the superior landmarks of dissection are in the upper abdomen. Although a higher view is afforded by the Palmer's point, there is a loss of central vision, which can be disorienting to the laparoscopist. A central view is imperative in para-aortic lymphadenectomy because the operative target is on both sides of the great vessels. Central vision allows the surgeon to approach each side of the operative field easily.[2,3] The Lee–Huang point not only provides a higher operative view with a wider working space, but its midline location also provides central vision rather than a lateral one.

To prevent intestinal injury due to previous laparotomy and previous laparoscopic umbilical entry

Placement of the primary trocar is a critical step in laparoscopic surgery, as most bowel and vessel injuries occur at this time. Adhesions from prior surgery may be troublesome especially in the umbilical area. Rates of umbilical adhesions range from 0% to 15% in women with prior laparoscopic surgery, 20–28% in those who have had previous laparotomy with horizontal suprapubic incisions, and 50–60% in those with longitudinal incisions. The location of the Lee–Huang point avoids these adhesions at the umbilicus. Furthermore, insertion at the Lee–Huang point is relatively safer compared to the Palmer's point.[4] Insertion through the latter requires the operator to traverse the abdominal muscles of the left upper quadrant. Exertion of excessive force to overcome resistance could lead to organ and vessel injury in inexperienced hands. By contrast, trocar entry through the Lee–Huang point at the avascular linea alba is easily accomplished without resistance from abdominal muscles. Making the skin incision larger than the trocar and usage of sharp disposable trocars with tip protection can further minimize resistance.

For laparoscopic entry with repeat umbilical entry failure

Complication rates with repeated umbilical entry 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% in more than three attempts.[5] Complications were extraperitoneal insufflation, omental emphysema, bowel injuries, and failed laparoscopy. Because of significantly increased complications with multiple attempts, alternative laparoscopic entry such at the Palmer's point or the Lee–Huang point should be considered after three failed insufflation attempts at the umbilicus. If contraindications to these points or continued failed attempts are encountered with these alternatives, changing to an open insertion technique or optical access (direct vision) is recommended. Relative contraindications to the use of the Lee–Huang point include a previous midline vertical incision, hepatomegaly, splenomegaly, and intestinal obstruction.

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For laparoscopic surgery in large pelvic pathologies

Large pelvic pathologies present as a challenge to the laparoscopist. The operative field is limited, especially when the mass is at the level of the umbilicus or even higher. Likewise, movements of instruments are restricted and there is difficulty in manipulation and removal of the specimen. To overcome this, the camera should provide a sufficient view of the operative field, and there should be adequate space for unimpaired motion of the surgeon's instruments. In general, a higher located primary trocar results in a better operative field. The distance between the primary trocar and the uterine fundus should be at least 8 cm to allow an adequate operative view with sufficient working space. The Lee–Huang point provides all these, as well as central vision, allowing the surgeons to approach both sides of the pelvis, despite any uterine distortion.[6,7]

For laparoscopic surgery in obese patients

Laparoscopic surgery in the obese patient is difficult because of the loss of anatomical landmarks that are necessary for primary trocar entry. Hurd et al[8] demonstrated that the umbilicus migrates caudally in relation to the aortic bifurcation as body mass index (BMI) increases. In nonobese patients (BMI <25), the umbilicus has a median location of 0.4 cm caudal to the aortic bifurcation. However, in overweight (BMI 25–30) and obese (BMI >30) patients, the umbilicus has a median location of 2.4 cm and 2.9 cm caudal to the aortic bifurcation, respectively. The Lee–Huang point, located midway between the xiphoid and umbilicus, provides a more stable landmark, especially for para-aortic lymph dissection in the obese patient, rather than the traditional umbilical insertion.

For laparoscopic ovarian transposition prior to pelvic irradiation

Pelvic irradiation inevitably causes castration in premenopausal patients such that long-term hormone replacement is indicated. Using the Lee–Huang point as a high level trocar insertion for laparoscopic ovarian transposition, both ovaries can be easily relocated to a high anterolateral position, 3–4 cm above the umbilical line.[9] Our method of ovarian transposition is simple and safe for the preservation of ovarian function and does not complicate subsequent oncologic therapy.

Today (2013), 20 years after the Lee–Huang point was established, we see its application in the emerging technology of robot-assisted laparoscopic surgery. Primary trocar insertion at the Lee–Huang point overcomes the bulky arms of the robotic da Vinci machine, while it continues to provide the proper view and working space for large pelvic masses and gynecologic cancer staging. What began as a concept of a primary laparoscopic insertion based on human anatomy that was compatible with the surgeon's head-to-foot orientation, has now developed into an essential surgical technique for the advanced laparoscopic surgeon. Truly, much has been accomplished since its conception in 1993 by Dr Chyi-Long Lee and Dr Kuan-Gen Huang.

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