

# Needlescopic-Assisted Surgery: Single-Incision or Multi-Incision Laparoscopic Surgery?

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Appendicitis is a common disease with a variety of clinical courses. The tip of appendix can be found in retrocecal, pelvic, and retroperitoneal location, and its symptoms are related to the varying location of the appendix. Surgical treatment includes two types of approaches: open surgery and laparoscopic surgery. Since the first laparoscopic appendectomy by Semm in 1981 [1], a variety of laparoscopic procedures have been performed. Classically, surgeons generally use three ports to perform an appendectomy: an umbilical port from 10 mm to 12 mm and two others of 5 mm. The appendix can be removed using an endoscopic stapler or endoloop. Recently, with the rising popularity of single-incision laparoscopic surgery (SILS), the adoption of this method for an appendectomy has been rapidly increasing. Needlescopic surgery or a minilaparoscopy has been tried by many surgeons as an attractive option to reduce scars and limit tissue trauma [2]. "Needlescopic surgery" was first described by Gagner and Garcia-Ruiz [3] in 1998. All surgical procedures were cholecystectomies. They defined as "needlescopic" those instruments that had a diameter of 3 mm or less. However, until now, the use of those instruments has been limited because of their insufficient strength and durability. In addition, small-diameter laparoscopes make it more difficult for surgeons to get clean images. What is the ideal application of needlescopic instruments?

Lee et al. [4] presented the ideal application of a needlescopic instrument. Ideal application means that surgeons ideally use needlescopic instruments with their inherent limitations of strength and durability. I think that an ideal application would not be for dissection but for traction. The authors used a needlescopic

instrument with a small-diameter (less than 3 mm), a Mediflex disposable suture grasper closure device, as a percutaneous organ-holding device. The authors compared clinical outcomes between a single-port laparoscopic appendectomy (SPA) using a glove port with a percutaneous organ-holding device (group 1) and a SPA using a commercially-available multichannel single port (group 2). In group 1, a percutaneous organ-holding device at the right lower quadrant abdomen was used to grasp the appendix. The umbilical incision length was 10 mm in group 1 and 20 mm in group 2. Postoperative pain scores during the first 24 hours were significantly lower in group 1 than in group 2 ( $P < 0.001$ ). The authors concluded that a SPA using a percutaneous organ-holding device could reduce postoperative pain by shortening the length of the incision. They used a needlescopic instrument just for traction. However, in the near future, surgeons may be able to use improved needlescopic laparoscopes and instruments with strengths that have been increased through technologic advances.

Surgeons are often obsessed with definitions. For example, if some surgeons absolutely follow the definition of SILS, they will make just one incision. To them, the difficulty and complexity of the surgery is not so important. Instead, the definition may be the main goal and main purpose. However, SILS has serious drawbacks: (1) the surgery is performed in a confined space, (2) all the laparoscopic instruments in a single space can cause excessive stretching of the wound, and (3) the stretching may lead to increased postoperative pain. Is needlescopic-assisted surgery single-incision or multi-incision laparoscopic surgery? The proponents of SILS may consider it to be needlescopic-assisted SILS. Conversely, the opponents of SILS may consider it to be multiport or multi-incision laparoscopic surgery. Because of this, defining the new technique is sometimes very difficult, and attempts at its definition are often very confusing. With new laparoscopic surgical procedures emerging daily, we surgeons should not be obsessed with making and following a specific definition, but should try to find the best surgical procedure for the patient.

Conclusively, although the definition of SILS is still being debated, needlescopic-assisted surgery seems to be a useful procedure for overcoming the difficulties of pure SILS.

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