

# Robotic single-site surgery: from research to clinical practice?

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With the introduction of laparoscopic cholecystectomy in the late 1980's, the endoscopic revolution was launched and the world of surgery changed forever. Over the years, minimally invasive surgery, namely operative laparoscopy, has emerged as the standard treatment for many gynecologic benign and malignant etiologies. Laparoscopic surgery has answered the patient's right to better cosmesis, less blood loss, faster recovery, shorter hospital stay, and less pain. A novel development in minimally invasive surgery that is even less invasive than traditional laparoscopy or robotic surgery is laparoendoscopic single-site (LESS) surgery. It is also known as single-incision laparoscopic surgery (SILS) or single-port access (SPA) surgery.

Benefits of LESS include better cosmesis, improved post-operative pain scores, and less post-operative narcotic use. A recent randomized trial by Chen et al. compared the immediate results of patients undergoing either two-channel single-port laparoscopic-assisted vaginal hysterectomy or conventional multiport laparoscopic-assisted vaginal hysterectomy [1-3]. The authors concluded that transumbilical two-channel single-port laparoscopic-assisted vaginal hysterectomy significantly decreases postoperative pain and analgesic use. Nevertheless, the evidence based for its application in gynecologic oncology still in its infancy. In this month's issue of the Journal of Gynecologic Oncology, two provocative manuscripts of single-site surgery in the setting of gynecologic malignancies are reported. Nam et

al. [4] report a single-institution retrospective series of seven women with benign and malignant gynecologic disease who underwent robotic single-port trans-umbilical total hysterectomy (R-SPH). The authors are to be commended for this publication, the largest report of R-SPH in the gynecologic literature including a robotic single-port trans-umbilical radical hysterectomy. The authors concluded that R-SPH is technically feasible in selected patients with gynecological disease, and that robotics may enhance surgical skills during single-port trans-umbilical hysterectomy, especially in patients with gynecologic cancers.

As clearly stated by Barkun et al. [5], surgical innovation is an important part of surgery. Its assessment is complex because of idiosyncrasies related to surgical practice, but necessary so that introduction and adoption of surgical innovations can derive from evidence-based principles rather than trial and error. The rationale to perform simple or radical hysterectomies via a robotic single-port 4 cm in size is unclear. At the very least, before adopting a new surgical technique or innovation we should ask ourselves the following: Is the innovation more effective? If not, is it at least equally effective, but safer? Does it improve the patient's experience? Is it more cost-effective? or easier to perform? The report by Nam et al. [4] does not address any of the above questions, and should be interpreted strictly as a feasibility research pilot study not a clinical standard, specifically for the management of gynecologic malignancies.

Also in this issue of the Journal of Gynecologic Oncology, Yoon et al. [6] reported on the utilization of single-port laparoscopy for the staging of a patient with a borderline ovarian tumor. A critical question with new technology is the adequacy, safety and oncologic outcomes in gynecologic malignancies when compared to standard methods. It is hard to make any robust evidence based conclusions on level III or uncontrolled

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descriptive reports. Nevertheless, a recent case series by Marocco et al. [7] from Italy, confirms the findings of Yoon et al. [6] on the feasibility of laparoscopic fertility-sparing staging of borderline ovarian tumors using LESS. The authors concluded that LESS staging of borderline ovarian tumors with preservation of fertility is feasible and effective with standard laparoscopic instruments.

In summary, more clinical data is needed to confirm putative advantages of single-site surgery in gynecologic oncology when compared with standard multi-access laparoscopic or robotic techniques. Although promising, single-port robotic surgery remains experimental and currently a topic of much debate and surgical research. Technology assessment, a robust discipline in medicine and health policy is essential in the field of surgical innovation. There should be a strict evidence-based progression from pre-clinical (animal/cadaver) early feasibility studies to subsequent clinical practice [8]. I congratulate both authors for their innovative work and research in this promising topic of minimally invasive surgery, and look forward to rigorous clinical trials in this area.

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