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COMMENTARY



## Mini-Laparoscopy or Single-Site Robotic Surgery in Gynecology? Let's Think out of the Box

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To date, the advancement of available technologies has led to the effective implementation of minimally invasive approaches in gynecology, with significant improvement of surgical as well as esthetic outcomes. From the first pioneering experiences of Kurt Semm with gynecological laparoscopy and the first laparoscopic hysterectomy performed by Harry Reich in 1989 [1], the technique standardization has radically reduced the use of open surgery and increased the use minimally invasive approaches. The implementation of laparoscopy avoided sizeable abdominal incisions, lowered perioperative complications, and reduced intraoperative blood loss. Moreover, minimally invasive surgery improved post-operative pain and allowed for a prompt return to daily activities, while consequently reducing hospitalization and overall healthcare costs.

In gynecology, the minimally invasive approach gained increasing popularity over time for both benign [2] as well as malignant [3] diseases. However, warnings concerning the use of the laparoscopic approach in gynecologic oncology have been raised by the randomized controlled trial of Ramirez et al. [4]. In this study, the authors demonstrated that minimally invasive radical hysterectomy is associated with lower rates of disease-free survival and overall survival than open abdominal radical hysterectomy among women with early-stage cervical cancer. This evidence changed the everyday clinical practice to manage cervical cancer and stressed the need for high-quality evidence before achieving definitive conclusions on the surgical approach in malignant diseases. However, besides this exception and the caution required in malignant pathologies, the use of minimally invasive techniques could be considered the gold standard approach for the management of gynecological diseases that require surgery.

In this scenario, technological enhancements with the development of 3-mm laparoscopic instruments (mini-laparoscopy) allowed for further improvement in outcomes, such as cosmetics, compared with conventional laparoscopy [5]. Following this line of research, some authors compared conventional mini-laparoscopy with single-site entry to investigate whether this option further increases the advantages of minimally-invasive surgery and achieves better outcomes

[6]. Fanfani et al. [7] in 2013 performed a trial in which 68 women who were undergoing hysterectomy were randomized to single-port robotic surgery (performed through a multichannel single trocar inserted in the umbilicus) versus mini-laparoscopy (performed through one optical trans umbilical 5-mm trocar and three 3-mm suprapubic ancillary ports). According to this study's results, mini-laparoscopic hysterectomy was associated with significantly lower operative time and less postoperative pain than single-site robotic hysterectomy. Regarding a distinction between the role of robotic surgery and single-site entry, the comparison of single-site robotic hysterectomy with single-site laparoscopic hysterectomy did not report significant differences in complication rate and intraoperative blood loss between the two approaches. However, the robotic group reported a longer operative time and a shorter length of hospital stay [8].

Given the need for further data on single-site minimally invasive surgery, specifically in robotic surgery, we acknowledge the importance of the study recently published in the *Journal of Investigative Surgery* [9]. Although based on a limited number of enrolled women, this recent research adds additional pieces of evidence about the possible role of a single-site approach in gynecologic robotic surgery. Indeed, classic robotic surgery needs two or even three arms (in case of complex cases), so one 12 mm and two or three 5–8 mm ports in different abdominal areas. In this regard, the use of a 35 mm transverse umbilical incision allows the placement of one 12 mm and two 8 mm ports, making single-site robotic surgery feasible, safe and effective even for oncological cases, with good esthetic outcomes. This peculiarity is essential and of paramount importance for an appropriate counseling, when several minimally invasive techniques are available and the surgeon is able to perform both mini-laparoscopy and robotic surgery, with or without single-site approach.

Taken together, these pieces of evidence indicate that minimally invasive surgery should be tailored to the patient, the surgeon's proficiency, and the equipment availability. Where available, robotic surgery increased the adoption of minimally invasive surgery, providing significant advantages

for the patients, and improved perioperative outcomes without higher healthcare costs [10]. Therefore, investigating the role of the single-site approach in robotic surgery, as provided by 3-mm laparoscopic instruments, may help to improve outcomes such as cosmetics.

## Disclosure statement

The authors have no proprietary, financial, professional or other personal interest of any nature in any product, service or company. The authors alone are responsible for the content and writing of the paper.

## Authors' contribution

All the authors conform the Journal and the International Committee of Medical Journal Editors (ICMJE) criteria for authorship, contributed to the intellectual content of the study and gave approval for the final version of the article.

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