



Minimally invasive surgery for deep-infiltrating endometriosis and its impact on fertility: can robotic surgery play a role?

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To the Editor,

Endometriosis is one of the most common gynecological diseases, mainly affecting fertile women with a prevalence ranging from 10 to 15%. Complications of endometriosis as well as its management often result in infertility since they can involve all pelvic organs including the procreative ones. Moreover, deep-infiltrating endometriosis (DIE) is known to be related to infertility and is often the cause of severe dyspareunia, which may impede regular sexual intercourse necessary for natural conception.

In last decade, many studies have described the benefits of minimally invasive surgery in the treatment of endometriosis, as direct manual laparoscopy (DML) is nowadays considered the gold standard, resulting in faster recovery, shorter hospitalization, better cosmetic results and lower postoperative morbidity if compared to open surgery. Furthermore, when surgery for colorectal endometriosis is necessary, the laparoscopic approach has been demonstrated to increase the chances of spontaneous conception and successful pregnancy if compared to laparotomy [1] and it also seems to increase the chances for conception by in vitro fertilization [2].

Nevertheless, DML presents several intrinsic technical limitations that make this kind of approach more challenging than open surgery [3]: ergonomic limitations, reduced degrees of freedom, a bi-dimensional view and an unstable

camera platform that is totally dependent on the assistant surgeon. Moreover, in pelvic endometriosis the operating field is rather narrow and anatomical landmarks lack.

In this scenario, robot-assisted surgery (RAS) may represent a rational step forward to achieve a safe and radical minimally invasive surgery for DIE, overcoming the kinematic limitations of the laparoscopic approach.

In a recent article focused on the robot-assisted surgery for the treatment of DIE with colorectal involvement, Morelli et al. [4] reported their preliminary experience, showing that RAS is associated with a small risk of complications, a good patient outcome and good preservation of urinary and sexual functions. Even when patients had severe pelvic disease requiring a radical approach with complex dissections, surgical and functional outcomes were better compared with those reported in literature for open and laparoscopic techniques. Better envisioning, wider mobilization of the rectum with gentle traction and countertraction and better control of energy delivery afforded by the robotic system allowed eliminating the endometriotic disease in a selective manner, minimizing the risk of intraoperative complication. However, one of the limitations of this article was that the authors were not able to draw any conclusion regarding fertility, as well as the few currently available studies comparing DML and RAS for endometriosis. Indeed, to date, while several studies have compared laparoscopic with open surgery for the treatment of DIE analyzing its impact on fertility, no trials comparing DML with RAS are available yet. The only prospective randomized trial currently available in literature [5] does not deal with the impact of the robotic vs laparoscopic surgery on fertility, only comparing these two minimally invasive approaches in terms of perioperative and short-term outcomes.

In conclusion, the management of patients with severe DIE who desire pregnancy is still debated. Although desperate attempts to avoid surgery in young women are more than

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justified, because of the complexity and of the inherent risk of the surgical procedure, the beneficial effect of surgery on the chances of spontaneous pregnancy can no longer be disputed. In this setting, RAS represents a technology capable of overcoming the limitations of DML but data about its role are dramatically lacking, while they warrant to be obtained.

For these reasons, we strongly believe that trials specifically investigating the impact of RAS for endometriosis on fertility should be encouraged to assess if robotic technology could really represent a breakthrough in this field.

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Compliance with ethical standards

Conflict of interest Dr Desirée Gianardi and Dr Andrea Giannini declare that they have no conflict of interest.

Statement of human rights and welfare of animals This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study informed consent is not required.

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