

Research Article

Bowel endometriosis treatment with robotic assisted laparoscopic resection – Is it a feasible alternative to laparoscopic approach?

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Introduction

Endometriosis is a gynecologic disorder defined by the presence of the endometrial gland and stroma outside the uterus. Deep infiltrating pelvic endometriosis with bowel involvement is one of the most aggressive forms and can cause infertility, chronic pelvic pain, pain at defecation, and altered quality of life.

Bowel endometriosis involvement is estimated to occur in 5.3% to 12% of women with endometriosis. In specialized centers, its prevalence can reach 35% among women with deep infiltrating endometriosis. The rectum and sigmoid together account for 70% to 93% of all intestinal endometriotic sites.

Rectovaginal and recto-sigmoid endometriosis are generally associated with severe progressively debilitating abdominal and pelvic pain, which markedly affects the quality of life in most the patients. Currently available medical approaches are equally effective in the treatment of endometriosis-associated pain, producing temporary relief of symptoms, but none has yet been shown to achieve a long-term cure. For these reasons, surgery needs to be considered the first treatment of choice [1].

Since the first case of laparoscopic sigmoid resection for endometriosis published by Redwine and Sharpe, few studies have confirmed the feasibility of laparoscopic colorectal resection for endometriosis.

The management of intestinal endometriosis depends on the depth of the bowel wall invasion [superficial, partial, or full-thickness invasion], leading to different surgical options [from disc excision to segmental resection]. It has been reported that the best results in terms of recurrence rates and improvement of symptoms are achieved by intestinal resection when the muscularis is compromised.

On the other hand, robotic technology and telemanipulation systems represent the latest developments in minimally-invasive surgery. They offer improved ergonomic position of the surgeon, three-dimensional visualization of the operating field, fine instrumentation and increased maneuverability of the instruments. These key features

allow complex minimally invasive procedures to be performed more easily than with conventional laparoscopic surgery. The feasibility of a variety of robotic-assisted surgical procedures in gastrosurgery such as cholecystectomy, colorectal resection, cardiomyotomy, and even esophagectomy has been demonstrated in many papers in the last decade. Several limitations of conventional endoscopic tools, such as limited instrument mobility or decreased ergonomics, have been partially overcome with the use of robotics.

Results

From September 2009 to January 2019, we have selected 134 patients with colorectal endometriosis referred to our private clinic [Centro de Endometriose São Paulo, São Paulo, Brazil] for the robotic approach. All patients had clinical and imaging diagnosis of deep infiltrating colorectal endometriosis evolving at least the muscularis of rectum or sigmoid. All these women were submitted to a robotic assisted resectosigmoidectomy with a mean operative time of 120 minutes. Regarding complications blood loss was insignificant [near zero] in all cases and there weren't any intra-operative or post-operative complications [as pneumonia, anastomotic or rectovaginal fistula, abdominal collections, long term ileus, intestinal adhesions]. None of the patients had ileostomy or colostomy and mean hospital stay was 3 days.

Sixty one patients had infertility before surgery, with a mean infertility time of 2 years. After 12 months of follow-up period, 28 [46%] women conceived naturally, and in 120 [90%] women symptoms as dysmenorrhea, dyspareunia and dyschezia, intestinal cramping, diarrhea or constipation completely disappeared.

Discussion

Deep infiltrating endometriosis is a challenge for laparoscopic pelvic surgeons. This series demonstrates that deep infiltrating endometriosis is a condition that requires interdisciplinary approach in order to obtain optimal clinical and medical results.

Deep infiltrating endometriosis cases are difficult to manage and require specific skills in laparoscopic, robotic and colorectal surgery.

These procedures are relatively safe and in the context of close collaboration between gynaecologists and surgeons, it presents low morbidity and mortality.

Important issue is that these procedures require adequate training and also short and long term results after the treatment of deeply infiltrating lesions are strictly operator-dependent. A multidisciplinary approach to manage deep pelvic endometriosis is mandatory in order to offer patients the best possible treatment using the combined skills of the colorectal and gynecologic surgical teams. [2]

As we know, the risk of complications depends on clinical conditions, vascular preservation, nerve preservation, the extension of endometriosis infiltration, and the surgeon's experience.

The use of robotic assistance provided a very precise dissection of the pelvic area, allowing good visualization of the pelvic plexus nerves, thus providing resection without nerve injury. The stable camera and the freedom of movement allow a very delicate and accurate dissection, as well as identification and preservation of the superior hemorrhoidal artery, providing good irrigation to the rectal stump and diminishing the incidence of rectal fistula. We did not have any complications in this series, such as fistula, local pain, nerve injury, or fecal or urinary incontinence, due to our previous large series in laparoscopic treatment for endometriosis and the association of the robotic technology in these cases. [3]

The main concern about robotic surgery is the cost, including the capital and ongoing maintenance charges. Robotic rectal surgery is constantly increasing over the years. Previous reviews have already demonstrated its safety and feasibility [4-6], although there are not published studies demonstrating its superiority over the laparoscopic approach mainly due to the lack of randomized control trials. This lack of evidence about the effectiveness of robotic rectal surgery is in contrast with the overall opinion of surgeons that report an easier surgical approach especially to narrow and difficult anatomic spaces such as the pelvis [7].

Conclusions

In conclusion, results from the present study demonstrate that robotic surgery is as feasible and safe as conventional laparoscopy in the treatment of colorectal endometriosis. The magnified view, the improved ergonomics and dexterity might improve the diffusion of minimally invasive approach in the treatment of deep infiltrating endometriosis, mainly evolving recto sigmoid area.

Further randomized studies should address the role of robotics for the treatment of deep infiltrating endometriosis.

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