



Laparoscopic ventral mesh rectopexy performed with ArtiSential®: a video vignette

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Since the introduction of laparoscopic ventral mesh rectopexy (LVMR) by D'Hoore in 2004 for the treatment of rectal prolapse, several studies and meta-analyses have shown its favorable anatomical and functional outcomes in alleviating symptoms of obstructed defecation syndrome (ODS) caused by rectal intussusception, rectocele and/or enterocele formation [1, 2]. With the advent of robotic surgery, some authors proposed that the articulation provided by this technology offered advantages in confined anatomical regions, like the pelvis, due to enhanced dexterity [3]. Yet the high cost associated with a robotic assisted LVMR together with a missing benefit of the robotic approach in terms of outcome, as some publications suggested, prevents this technology from being adopted as a standard treatment [4, 5].

In this video, we present the first LVMR to be performed with the fully articulated hand-held ArtiSential® single-use laparoscopic device (LIVSMED, Inc., Republic of Korea). The ArtiSential® laparoscopic device is a mechanically controlled hand-held instrument that enjoys a fully articulated double-jointed tip or end-effector (Fig. 1). A whole line-up of these instruments is available with both modes of cautery, monopolar and bipolar: forceps, dissector, spatula, scissors, hook, needle holder, and clip applicator.

The patient is a 55-year-old female patient with a body mass index of 22 kg/m² with ODS caused by rectal intussusception with a concomitant large rectocele and a large enterocele (Fig. 2). Conservative treatment had not been successful.

The patient was placed in the standard modified lithotomy position and secured in a surgical bean bag positioner with both padded arms tucked at the patient's sides. A 10 mm camera port was utilized in the umbilical region. Two 12 mm

ports were placed in the right lower quadrant and right mid-abdomen along the midclavicular line respectively. One 5 mm port was placed in the suprapubic region along the midline. The surgeon stood on the patient's right side while the camera assistant and the second assistant stood on the left (see video). The second assistant utilized a Deaver's retractor, introduced into the vagina, to enable an easier dissection in the rectovaginal space. The laparoscopy tower was placed at the foot of the table. The sigmoid colon was withdrawn out of the pelvis and the rectum was stretched out by tacking an epiploic appendix of the sigmoid to the left abdominal wall. A LVMR was performed according to the principles described by D'Hoore et al. (2004). Dissection was performed with an ArtiSential® monopolar articulated hook, an ArtiSential® bipolar articulated forceps, and an ArtiSential® bipolar dissector. The peritoneum was incised on the right side of the rectosigmoidal junction at the level of the sacral promontory. The peritoneal incision was extended along the base of the mesorectum down to the anterior peritoneal reflection making from there a J-form cross over to the left side. Dissection was then continued in the rectovaginal space until the pelvic floor was reached. A 4 × 20 cm strip of Mesh (Symbotex™ Composite Mesh, Medtronic, Trevoux, France) was inserted into the rectovaginal space. The lowest 2 cm of the mesh strip were reflected upon the posterior vaginal wall while fixing the mesh on the ventral aspect of the most distal rectum with 8 interrupted non-absorbable Ethibond® Excel 2-0 sutures (Ethicon, Johnson & Johnson, Norderstedt, Germany) in a 3-3-2 configuration. The opposite end of the mesh was fixed to the sacral promontory using 5 titanium tacks (Autosuture Protack 5 mm, Covidien, Mansfield, MA, USA) and one Ethibond® Excel 2-0 suture. The peritoneal incision was then closed with a resorbable running V-Loc™ 180 barbed suture (Covidien, Inc., Mansfield, MA, USA) to cover the mesh entirely.

There were no intraoperative complications. At a follow-up 12 weeks after surgery, the patient reported normal passage of stool with no need for laxatives or digitation. Clinical

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Fig. 1 The ArtiSential® articulated laparoscopic forceps

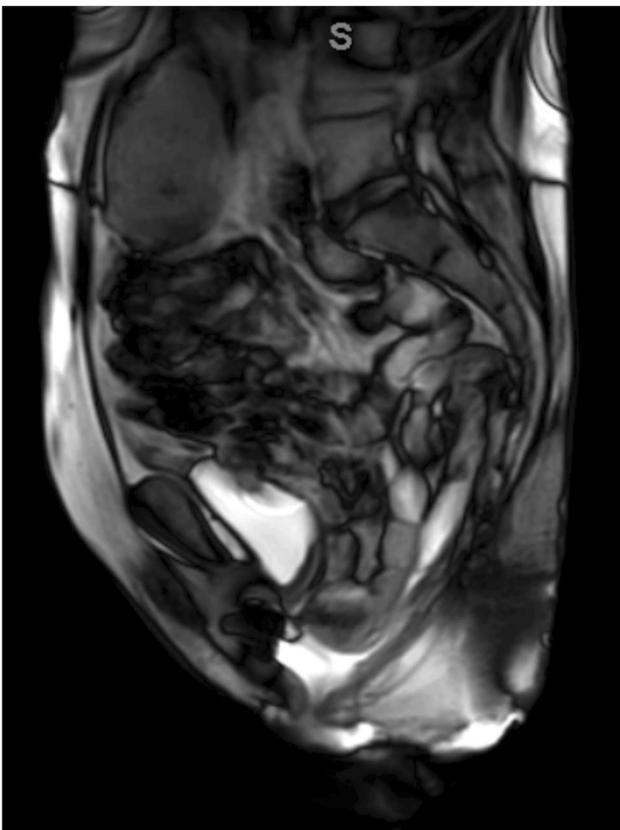


Fig. 2 Magnetic resonance defecography showing a large enterocele, enterocele and a severe rectal descent

examination revealed no rectocele or intussusception. An obvious preoperative-to-postoperative reduction of the functional scores was noted (Altomare's ODS score: 19–3, CCCS: 19–2).

This first look at the agility offered by the fully articulated ArtiSential® instruments in performing an LVMR also suggests that performing this procedure with these instruments is feasible and safe. The double-jointed end effector together with pulley-system-based mechanics allow for a unique maneuverability not known before in the field of conventional laparoscopy. Obviously, further studies are needed to elaborate on these observations.

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Declarations

Conflict of interest LIVSMED provided the ArtiSential® instruments free of charge. The authors declare otherwise that they have no conflict of interest.

Ethical approval This publication was approved by the institutional review board.

Informed consent Informed consent was obtained from the patient to perform the procedure and to publish any related pseudonymized scientific data or media.

References

1. Singh S, Ratnatunga K, Bolckmans R, Iqbal N, Jones O, Lindsey I, Gorissen K, Cunningham C (2020) Patients' perception of long-term outcome after laparoscopic ventral mesh rectopexy; Single Tertiary Center Experience. *Ann Surg*. <https://doi.org/10.1097/SLA.0000000000004559>
2. Consten EC, van Iersel JJ, Verheijen PM, Broeders IA, Wolthuis AM, D'Hoore A (2015) Long-term outcome after laparoscopic ventral mesh rectopexy: an observational study of 919 consecutive patients. *Ann Surg* 262(5):742–747. <https://doi.org/10.1097/SLA.0000000000001401> (**Discussion 747–748**)
3. Trastulli S, Farinella E, Ciocchi R, Cavaliere D, Avenia N, Sciannameo F, Gulla N, Noya G, Boselli C (2012) Robotic resection compared with laparoscopic rectal resection for cancer: systematic review and meta-analysis of short-term outcome. *Colorectal Dis* 14(4):e134–156. <https://doi.org/10.1111/j.1463-1318.2011.02907.x>
4. Ramage L, Georgiou P, Tekkis P, Tan E (2015) Is robotic ventral mesh rectopexy better than laparoscopy in the treatment of rectal prolapse and obstructed defecation? A meta-analysis. *Tech Coloproctol* 19(7):381–389. <https://doi.org/10.1007/s10151-015-1320-7>
5. Faucheron JL, Trilling B, Girard E (2019) Robotic ventral mesh rectopexy for rectal prolapse: a few years until this becomes the gold standard. *Tech Coloproctol* 23(5):407–409. <https://doi.org/10.1007/s10151-019-02016-8>

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