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ORIGINAL ARTICLE

Early experience with ambulatory robotic ventral rectopexy☆

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KEYWORDS
Rectal prolapse;
Robotic surgery;
Ambulatory surgery;
Ventral rectopexy;
Minimally invasive surgery

Summary
Objective of the study: Ventral rectopexy can be performed robotically with only limited trauma for the patient, making its performance in an ambulatory setting potentially interesting. The aim of this study is to report our preliminary experience with ambulatory robotic ventral rectopexy in consecutive patients.
Patients and methods: Ten consecutive patients underwent robotic ventral rectopexy for total rectal prolapse ($n = 8$) or symptomatic enterocele ($n = 2$) between February 2014 and April 2015. Patients were selected for outpatient treatment based on criteria of patient motivation, favorable social conditions, and satisfactory general condition. Patient characteristics, technical results and cost were reported.
Results: The mean operating time was 94 minutes (range: 78—150). The average operating room occupancy time was 254 minutes (222—339). There were no operative complications, conversion to laparotomy, or postoperative complication. The average duration of hospital stay was 11 (8—32) hours. Two patients required hospitalization: one for persistent pain and the other for urinary retention. The average maximum pain score recorded on postoperative day 1 was 2/10 on a visual analog scale (range: 0—5/10). Estimated average cost (excluding amortization of the purchase of the robot) was € 9088 per procedure.
Conclusions: Ambulatory management of robotic ventral rectopexy is feasible and safe.

Introduction

Total rectal prolapse and symptomatic enterocele are established indications for ventral rectopexy [1]. The laparoscopic approach offers several advantages over the open surgical approach for this procedure: decreased postoperative pain, faster recovery, shorter hospitalization and minimal incisional scars [2—4]. While the procedure is challenging, laparoscopic ventral rectopexy can be performed with only minor trauma to the patient, thus creating an

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opportunity for outpatient management. Increasingly, we have proposed this mode of management for our patients requiring surgery for pelvic static disorders [2]. The goal of this study is to report our preliminary experience of ambulatory management of robotic ventral rectopexy for total rectal prolapse or enterocele in consecutive patients. To our knowledge, this represents the first published series of consecutive patients treated as outpatients by robotic ventral rectopexy.

Patients and methods

Patients

This series included all patients in our institution who underwent ventral rectopexy for total rectal prolapse or symptomatic enterocele using the da Vinci Si® between February 2014 and April 2015. Selection of patients for outpatient treatment was based on criteria of patient motivation, favorable social conditions and satisfactory general condition (American Society of Anesthesiologists [ASA] score, associated co-morbidities, etc.) according to the recommendations of the HAS (French High Health Authority) and the French National Society of Colo-Proctology that were published recently in this same Journal [5]. All surgeries were performed by a senior surgeon. Patients treated with conventional hospitalization, patients treated for recurrent prolapse and patients treated for complex static disorders requiring the association of several pelvic gestures were excluded.

The pre-operative assessment included a complete history of the disease and its antecedents, as well as a physical examination including digital pelvic examination. Assessment of external rectal prolapse was made with the patient standing, then squatting, and finally lying down, both at rest and with straining. The diagnosis of grade 3 or 4 enterocele was determined by patient history and clinical examination in the squatting position. Dynamic defecography (colpocysto-defecography in women) was performed in all patients to confirm total prolapse of the rectum and especially of enterocele. The technique of this radiological examination has been described elsewhere [6,7]. All patients underwent rectosigmoidoscopy (or outpatient colonoscopy), anorectal manometry, endo-anal ultrasound and pellet transit time. This surgery has always been scheduled as a first or second case in the operating schedule with the aim of completing the surgery, if possible, before noon. All interventions were carried out in accordance with the ethical standards of the Ethics Committee of our Institution and according to the Helsinki Declaration of 1964 and its subsequent amendments. A satisfaction score was used with scores ranging from 1 to 4 (1 = ''not at all satisfied'', 2 = ''not satisfied'', 3 = ''satisfied'', 4 = ''very satisfied''). Patient data were anonymized before analysis. Quantitative variables were presented using descriptive statistics, specifically means with standard deviations, medians with ranges.

Surgical technique

Our technique is essentially the same as we have previously described for laparoscopic ventral rectopexy [2]. All patients received a 200 mL enema on the morning of the surgery and a 2 g dose of intravenous cefoxitin at the time of anesthetic induction. A bladder catheter was systematically inserted before the surgical procedure and removed in the operating room before waking, during the checklist at the end of surgery. The da Vinci Si robot® with its 4 arms was docked to the left of the patient. The 10 mm balloon trocar for optics was placed in the umbilicus (Fig. 1). Two 8 mm trocars of the robot were placed in the right and left iliac fossae for the passage of instruments controlled by the surgeon. Another 12 mm trocar was inserted at the junction of the right iliac fossa and the right flank, for the passage of the assistant's instruments (fenestrated grasper for exposure, extraction of the peritoneum after resection of the pouch of Douglas, introduction of mesh and staplers, suction if necessary). The table was placed in deep Trendelenburg position, so that the small intestine remained spontaneously in the upper part of the abdomen after eventual pelvic viscerolysis. The anterior surface of the prevertebral ligament at the pelvic brim was exposed using monopolar hook cautery to the right of the base of the mesosigmoid as the assistant retracted it to the left, over a limited area of 3 cm × 2 cm, in order to avoid damaging the superior hypogastric plexus. The peritoneum of the *cul-de-sac* was systematically excised over the entire length of the posterior vaginal wall in females and to a length of 8 cm along the anterior face of the rectum. After these two structures were well defined, the dissection was pushed down to the level of the sphincter apparatus and the pelvic floor. Lateral and posterior dissection was strictly avoided in order to spare the inferior hypogastric plexus and the innervation of the pelvic organs. Two 20 × 1.5 cm strips of synthetic mesh (Parietex Prosup®, Covidien©, Medtronic©, United States Surgical, Norwalk, CT, USA) were affixed respectively to the left and right anterolateral surfaces of the lower rectum using 5 titanium staples (Endo Universal 65° 4.0 mm, ref. 173054, Covidien©, Medtronic©, USA Surgical, Norwalk, Connecticut, USA) and fixed together at the pelvic brim after tensioning using three tacker-type chromium staples (Protack® 5.0 mm, Ref 174006, Covidien©, Medtronic©, United States Surgical, Norwalk, Connecticut, USA). Finally, the pelvic peritoneum was closed with sutures over the prosthetic mesh strips using a non-resorbable suture to isolate them from the abdominal cavity and especially from the small intestine, thereby creating a shallower *cul-de-sac* as treatment for the enterocele, one of the anatomical components responsible for external prolapse [2]. No pelvic drainage was left in place. Local anesthetic was sprayed under the diaphragmatic cupolas and in the abdominal cavity and the trocar sites were infiltrated

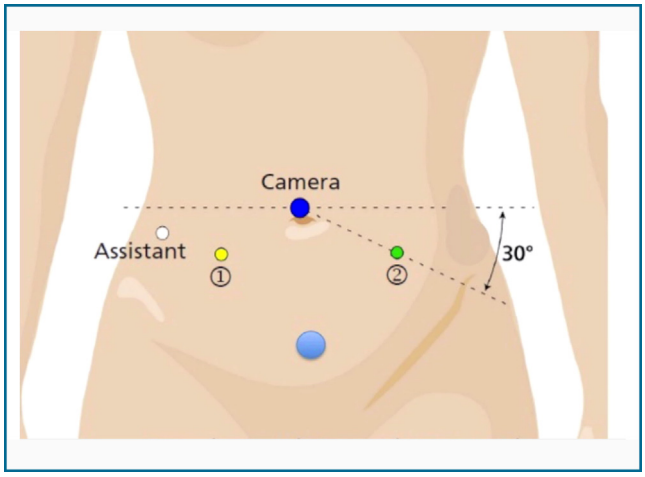

Figure 1. Laparoscopic port position.

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