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Original research

Long-term results of robotic sacral hysteropexy for pelvic organ prolapse in China Single medical center

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HIGHLIGHTS

- Evaluation of the long-time clinical outcomes of robotic sacral hysteropexy for pelvic organ prolapse.
- The robotic sacral hysteropexy is a minimally invasive technique for pelvic organ prolapse repair.
- The robotic sacral hysteropexy give low complication rates and high patient satisfaction.

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ABSTRACT

Objective: To evaluate the long-time clinical outcomes of robotic sacral hysteropexy for pelvic organ prolapse (POP).
Methods: Five women who underwent robotic sacral hysteropexy for the treatment for POP. Blood loss, operative time, length of stay, blood transfusion, pulmonary embolus, gastrointestinal or genitourinary tract injury, ileus, bowel obstruction, post-operative fever, and urinary retention were recorded for all patients.
Results: All the operative procedures were successfully performed using the robotic approach. In one case with perineal laceration, perineal repair was simultaneously performed, and in one patient with combined leiomyoma, myomectomy was performed first. The other three cases underwent no additional procedures during the surgery. Neither intra-nor post-operative complications occurred in all 5 cases. After follow-up one year, all patients declared their satisfaction with the achieved anatomical and functional results.
Conclusions: The robotic sacral hysteropexy is a minimally invasive technique for POP repair. We found low complication rates and high patient satisfaction with a minimum of 1 year followup. Larger series with longer follow-up data are needed to justify its widespread use.

1. Introduction

POP represents a worldwide public health issue with a 12% cumulative risk of patients requiring reconstructive surgery during their lifetime [1]. It has been estimated that 1 in 9 women will undergo a hysterectomy in their lifetime, and up to 10% of these women will require surgical repair to treat symptomatic vaginal prolapse [1]. The estimated national annual direct cost for POP operations was over $1 billion in 1997 [2]. The number of POP patients is increasing annually in China, and 11–19% of patients with POP may receive surgical treatment [3].

The search for an ideal repair that offers the best combination of efficacy, safety, and durability in the treatment of POP is a new objective. Despite the fact that most cases requiring POP repair are postmenopausal and are usually treated by hysterectomy, the number of young patients with POP symptoms who desire uterine

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preservation and fertility are growing. Therefore, reconstructive fertility-sparing procedures are considered a viable option in selected cases. Several alternative operations with uterine preservation have been proposed, including sacral-promontory fixation using the laparoscopic approach. In 2005, the Food and Drug Administration approved the da Vinci surgical (S) system (Intuitive Surgical, Inc., Sunnyvale, CA, USA) for use in gynecological surgery. Compared to conventional laparoscopy, robotic-assisted hysterectomy performed for cancer staging has similar or shorter operative times, less estimated blood loss, fewer intraoperative transfusions, fewer conversions to traditional laparotomy, and a shorter length of stay [4]. The introduction of robotics has represented a significant technologic advancement in gynecological surgery. In addition, robotic-assisted surgery has become a tool in the treatment of POP. Robotic sacrocolpopexy has been shown to have less blood loss and a shorter in-house recovery while maintaining equivalent prolapse support to the abdominal sacrocolpopexy in the short-term postoperative period. We report on 5 cases of robotic sacral hysteropexy with a medium-term follow-up.

2. Materials and methods

The study design was approved by PLA General Hospital ethics review board (NO. S2011-092-03) and complies with STROBE guidelines. We performed a retrospective study to evaluate the clinical outcomes among women who underwent robotic sacral hysteropexy for the treatment of POP. Data were collected between January 2012 and February 2014 from the Department of Obstetrics and Gynecology at the People's Liberation Army General Hospital. The eligibility criteria are listed in Table 1. Five women with complaints of POP symptoms with anatomical evidence of POP (≥II stage) were addressed for surgical treatment. The POP was staged according to the POP-quantification (Q) system [5]. There was one patient with perineal laceration and one with a combination of leiomyoma. The other patients had no gynecological comorbidities. All patients were pre-operatively evaluated with a clinical history, physical examination, and post-void residual check. The surgical operations were manipulated following the standard pattern by our gynecologists team. The surgical options were explained to the patients, and written informed consent was obtained from all patients prior to performing the procedures.

A team of gynecologists performed the surgeries. All patients agreed to face-to-face follow-up at 1, 3, and 6 months postoperatively. First, we recorded blood loss, operative time, the length of stay, blood transfusion, pulmonary embolus, gastrointestinal or genitourinary tract injury, ileus, bowel obstruction, postoperative fever, pneumonia, wound infection, and urinary retention daily.

2.1. Surgical technique

All procedures were performed under general anesthesia with the patient placed in the lithotomy position using stirrups. The patients' legs were abducted with hip extension to accommodate the second assisting surgeon and the robotic surgical cart between their legs, and their arms were tucked comfortably. A 30° Trendelenburg position was obtained to displace the small bowel so that it was away from the pelvic area. All patients received mechanical bowel preparation, short-term intravenous antibiotic prophylaxis with cefazolin, and compression stockings for deep venous thrombosis prophylaxis. Techniques for robotic sacrocolpopexy have been previously described [6–8]. A total of 5 ports were used (Fig. 1): a 12-mm camera port was placed using the camera; two 8 mm ancillary robotic trocars were placed away from the camera port at 8–10 cm under the umbilical horizontal angle of 30°; an ancillary 12 mm trocar was placed in the right subcostal area; and a 5 mm trocar was placed in the Michael's point, which was to be used by the assisting surgeon for retraction, introduction of the sutures, and suction/irrigation. To perform the operation, the uterus was lifted by the second assisting surgeon. After port placement, the patient was placed in a steep Trendelenburg position, and the da Vinci S surgical system was docked at the foot of the bed between the patients' legs.

The vesicouterine peritoneum was opened after establishing the artificial pneumoperitoneum by cutting the broad ligament bilaterally to the anterior peritoneal along the round ligament. We pushed down on the bladder cervical anterior vaginal wall about 2–3 cm to achieve separation of the uterine, rectum, and peritoneal nest. In front of the sacrum and the left and right iliac arterial bifurcation below, we established an opening on the side of the peritoneum around the right iliac, 1 cm along the right ureter.

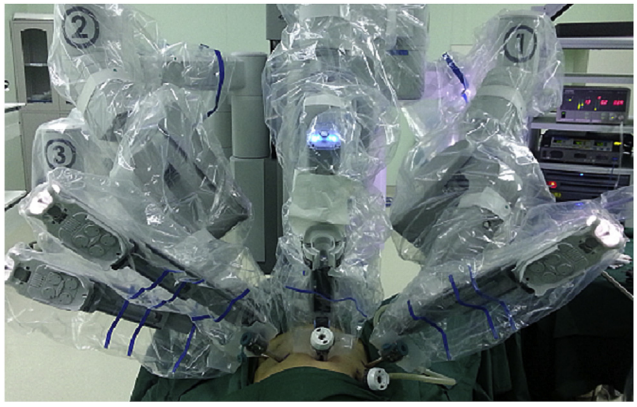

Fig. 1. Standard laparoscopic port placement for robotic-assisted laparoscopic sacrocolpopexy. The laparoscopic ports are 10 mm right subcostal and 5 mm inferior laterally. The robotic ports are paraumbilical to the camera port, and 2 mm and 8 mm working ports are lateral to the rectus muscle superior to the iliac crest.

Table 1
Eligibility criteria.

Inclusion criteria
1. Stages II–IV pelvic organ prolapse (POP) according to the POP-quantification (Q)
2. Prolapse of the vaginal apex or cervix to at least half way into the vaginal canal (POP-Q point C ≥ total vaginal length ÷ 2)
3. Minimally invasive robotic sacral hysteropexy is planned
4. Patient is available for follow-up
5. Patient is able to complete the study assessments per the clinician's judgment
6. Patient is able and willing to provide written informed consent
Exclusion criteria
1. Pregnant or pregnancy in the last 12 months
2. Plans for future childbearing
3. Patient refused the robotic operation
4. Women of childbearing age with multiple leiomyomas