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European Association of Urology

Surgery in Motion

Robot-assisted Sacrocolpopexy for Pelvic Organ Prolapse: Surgical Technique and Outcomes at a Single High-volume Institution

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Article info

Article history:
Accepted May 30, 2013
Published online ahead of print on June 11, 2013

Keywords:
Sacrocolpopexy
Pelvic organ prolapse
Robot-assisted surgery
Surgical technique

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Abstract

Background: Pelvic organ prolapse (POP) represents a common female pelvic floor disorder that has a serious impact on quality of life. Several types of procedures with different surgical approaches have been described to correct these defects, but the optimal management is still debated.
Objective: To describe our surgical technique of robot-assisted sacrocolpopexy (RASC) for POP and to assess its safety and long-term outcomes.
Design, setting, and participants: A retrospective review of the medical records of 95 consecutive patients who underwent RASC for POP at our centre from April 2006 to December 2011 was performed.
Surgical procedure: RASC with use of polypropylene meshes was performed in all cases using a standardised technique with the da Vinci Surgical System (Intuitive Surgical, Sunnyvale, CA, USA) in a four-arm configuration.
Outcome measurements and statistical analysis: Clinical data were collected in a dedicated database. Intraoperative variables, postoperative complications, and outcomes of RASC were assessed. A descriptive statistical analysis was performed.
Results and limitations: Median operative time was 101 min. No conversion to open surgery was needed. One vaginal and two bladder injuries occurred and were repaired intraoperatively. Only one Clavien grade 3 postoperative complication was observed (bowel obstruction treated laparoscopically). At a median follow-up of 34 mo, persistent POP was observed in four cases (4.2%). One mesh erosion occurred and required robot-assisted removal of the mesh. Ten (10.5%) patients complained de novo urgency after RASC, which resolved in the first few weeks after surgery. No significant de novo bowel or sexual symptoms were reported.
Conclusions: Our technique of RASC for correction of POP is safe and effective, with limited risk of complications and good long-term results in the treatment of all types of POP. The robotic surgical system facilitates precise and accurate placement of the meshes with short operative time, thereby favouring wider diffusion of minimally invasive treatment of POP.
Patient summary: We studied the treatment of patients with vaginal prolapse by using a robot-assisted surgical technique to fix the vaginal wall with a synthetic mesh. This technique was found to be safe and effective, with limited risk of complications and good long-term results.

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0302-2838/$ – see back matter
http://dx.doi.org/10.1016/j.eururo.2013.05.054

1. Introduction

Pelvic organ prolapse (POP) represents a common female pelvic floor disorder that increases with age and has a serious impact on quality of life (QoL). It is estimated that 30% of women aged 50–89 yr will seek consultation for pelvic floor disorders [1,2]. The purpose of any surgical repair of POP is to restore pelvic anatomy, preserving urinary, intestinal, and sexual function, with the lowest rate of recurrences and complications.

Historically, surgical repair has been performed through either a vaginal or abdominal approach. Although vaginal procedures have the advantage of decreased morbidity, shorter hospitalisation, and convalescence, they have consistently lower long-term success rates compared to abdominal sacrocolpopexy [3,4]. In contrast, the abdominal approach is considered the gold standard for surgical correction of vaginal vault prolapse, with reported long-term efficacy rates [5,6]. However, the associated morbidity of open laparotomy has made this procedure less favourable. In an effort to overcome these drawbacks, a minimally invasive laparoscopic approach has been adopted. However, the rigidity of the laparoscopic instrumentation makes intracorporeal suturing and dissection in the narrow pelvis challenging [7].

Robot-assisted technology, with its stereoscopic vision and the use of wristed instruments, offers an ergonomic platform that simplifies complex laparoscopic tasks and has been widely adopted by pelvic surgeons [8]. In our institution, robot-assisted sacrocolpopexy (RASC) has been implemented since 2006. The aim of this paper is to describe our contemporary surgical technique and assess the outcomes of RASC at our high-volume centre.

2. Methods and patients

2.1. Study population

Data were collected retrospectively from the medical records of a consecutive series of 95 patients who underwent RASC for POP at the OLV Vattikuti Robotic Surgery Institute between April 2006 and December 2011. All patients were counselled about the risks, benefits, and alternative treatments and signed an informed consent.

Preoperative evaluation included medical history, physical examination, and laboratory exams in all patients. Urodynamic studies were not routinely performed. Pelvic dynamic magnetic resonance imaging was obtained in selected cases.

Patients' demographics, clinical characteristics, and symptoms at presentation are reported in Table 1. The indications for RASC were primary or recurrent POP, including deficiency of the anterior compartment (cystocele), middle compartment (vaginal vault prolapse, enterocele), posterior compartment (rectocele), or a combination of them (Table 2). The POP grade according to the Baden-Walker classification is reported in Table 3. RASC was generally indicated for grade 3–4 POP, but a lower-grade prolapse was treated in selected cases when the patients reported significant functional impairment, pain, or discomfort. Nine cases (9.5%) were referred to our centre after failure of a previous vaginal procedure (seven cases) or abdominal procedure (two cases) for POP. Thirty-eight patients (40%) had undergone a previous hysterectomy, either with vaginal or abdominal approach, and 15 (15.8%) had vaginal tape implanted for stress urinary incontinence (SUI) prior to RASC.

Table 1 – Demographics, clinical characteristics, and frequency of symptoms at presentation in our series

	Median	IQR
Age, yr	67	63–73
BMI	29	28–32
ASA score	1	1–2
	No.	**%**
Pelvic heaviness	90	94.7
Urgency	31	32.6
SUI	20	21.1
Dysuria	17	17.9
Constipation	12	12.6
UTI	8	8.4

IQR = interquartile range; BMI = body mass index; ASA = American Society of Anaesthesiologists; SUI = stress urinary incontinence; UTI = urinary tract infection.

Table 2 – Characteristics of pelvic organ prolapses in our series

No. of compartments	Compartments	Anatomic location of prolapse	No. of patients
1	Anterior	Cystocele	42
	Middle	Vaginal vault prolapse	0
		Enterocele	1
		Vaginal vault plus enterocele	0
	Posterior	Rectocele	3
	Total: One compartment		**46**
2	Anterior plus middle	Cystoceles plus vaginal vault	6
		Cystoceles plus enterocele	3
		Cystoceles plus vaginal vault plus enterocele	1
	Anterior plus posterior	Cystoceles plus rectoceles	31
	Posterior plus middle	Rectocele plus vaginal vault	0
		Rectocele plus enterocele	1
		Rectocele plus vaginal vault plus enterocele	0
	Total: Two compartments		**42**
3	**Total: Anterior plus middle plus posterior**	Cystoceles plus vaginal vault and/or enteroceles plus rectoceles	**7**
1 + 2 + 3 *(all patients)*	**Anterior and/or middle and/or posterior** *(all patients)*	**Cystocele and/or vaginal vault and/or enteroceles and/or rectoceles** *(all patients)*	**95**