European Journal of Obstetrics & Gynecology and Reproductive Biology 165 (2012) 122–127

Contents lists available at SciVerse ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

Uterine preservation in pelvic organ prolapse using robot assisted laparoscopic sacrohysteropexy: quality of life and technique

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ARTICLE INFO

Article history:
Received 2 January 2012
Received in revised form 4 July 2012
Accepted 26 July 2012

Keywords:
Uterine prolapse
Quality of life
Robotic surgery
Sacrohysteropexy

ABSTRACT

Objective: Measuring quality of life of women with disorders of the pelvic floor is crucial when evaluating a therapy. The aim of this study is to profile health related quality of life of women with pelvic organ prolapse who are treated with robot assisted laparoscopic sacrohysteropexy (RALS). We also compare the operative characteristics and learning curve in this study with the current literature and describe the surgical technique.

Study design: A prospective cohort study in a teaching hospital in The Netherlands. Fifty women with uterovaginal prolapse were treated with RALS. This study presents the largest cohort in Europe treated by RALS to date. Quality of life was assessed pre- and post-operatively using the UDI/IIQ validated self-questionnaire designed for Dutch-speaking patients. Clinical and operative data were prospectively collected up to 29 months. RALS was performed with preservation of the uterus. Statistical analysis of categorical data was performed with the paired *T*-test. Descriptive statistics were computed with the use of standard methods for means, median and proportions.

Results: Before operation, overall wellbeing was scored at 67.7% and after surgery this improved to 82.1% ($p = 0.03$). Feelings of nervousness, frustration and embarrassment reduced significantly. Sexual functioning improved, but not significantly. The mean operative time was 223 (103–340) min. Operative time decreased significantly with gained experience and became comparable to the operative time for abdominal sacrocolpopexy and classic laparoscopy. Average blood loss was less than 50 ml and patients had a mean hospital stay of 2 days. Of all women, 95.2% were very satisfied with the result after RALS.

Conclusion: Health related quality of life improves significantly after RALS. There are high rates of patient satisfaction. RALS proves to be a safe and effective treatment of pelvic organ prolapse. Operative time is comparable to abdominal sacrocolpopexy and classic laparoscopy in the current literature.

1. Introduction

Pelvic organ prolapse is a common health problem in women. Approximately 30–40% of all women develop some degree of vaginal prolapse in their lifetime [1]. Abdominal sacrocolpopexy is still thought of as the gold standard for vaginal vault or uterine prolapse, due to its high success rates (84–99%) and durable results [2]. Unfortunately, due to a relatively high degree of morbidity many patients are unable to tolerate this surgery. Complications include haemorrhage (8.9%), gastro-intestinal complications including ileus and small bowel obstruction (18.9%) and wound infection (11.1%) [3,4]. Consequently, there has been a shift towards less invasive transvaginal surgery. This approach shows success rates of 85–89% after 5 years, which makes the durability comparable to the abdominal procedure. The results of transvaginal surgery are not uniform, however, and a considerable number of cases of mesh exposure and de novo dyspareunia have been reported [5–10].

A third option is the minimal invasive laparoscopic approach, which combines the benefits of the abdominal procedure with the advantages of transvaginal surgery. Limitations, however, such as longer operating time, reduced dexterity and relatively difficult operating technique have prevented this approach from becoming the standard treatment for pelvic organ prolapse [11].

The development of robotic surgery has helped to reduce the limitations of classic laparoscopy by combining the benefits of minimal invasive surgery and transabdominal surgery [2,12–14]. The advantages of robotics compared to classic laparoscopy include use of a magnified 3-dimensional image, instrumentation with increased robotic manoeuvrability (which improves suturing and dissection capability), tremor filtration and motion scaling [15].

Since the introduction of robot assisted laparoscopic sacrohysteropexy (RALS), several studies have described the surgical characteristics, such as operating time, blood-loss and the duration

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http://dx.doi.org/10.1016/j.ejogrb.2012.07.025

of hospital stay [2,12,14], but a detailed study on the quality of life, which would play an important role in choosing a therapy, has not yet been conducted.

Surgical success based on anatomical outcome relates poorly to the patient's experience [16]. Surgical failure can lead to minimal complaints, while patients with good anatomical outcome can remain unsatisfied [17,18]. Pelvic prolapse presents with a broad range of symptoms. Women affected often report limitations in physical, emotional, social and sexual functioning. The primary aim of this study is to profile health-related quality of life before and after RALS. Furthermore, surgical characteristics are compared to the current literature and the operating technique is described. A unique aspect of this study is the fact that RALS was performed with uterus preservation in all women, whereas in previous studies most patients had undergone hysterectomy prior to RALS.

2. Materials and methods

The study was conducted in the gynaecological surgery unit of the Maasstad Hospital in Rotterdam, The Netherlands. From June 2009 through April 2011, we included 50 women with uterine prolapse defined by a Baden–Walker score of 3 or more [19]. Follow-up continued until November 2011. The mean age was 57.7 years (36–77). Mean body mass index (BMI) was 25.8 (20.3–35.2). Mean parity was 2.3 (0–7). According to the Baden–Walker classification, 22 women suffered from prolapse grade 3 and 28 women suffered from prolapse grade 4. Grade 3 or 4 cystocele and/or rectocele were identified in 30 and 5 women respectively. In 78% of the women prolapse involved at least two pelvic compartments (Fig. 1).

Patients were offered RALS after they had tried other options such as pelvic exercises and/or a pessary. Excluded were women with an American Society of Anesthetists (ASA) score of 3 or more, women with predisposition to pelvic adhesions due to former abdominal surgery, women suffering from diverticulitis and women with a BMI above 30. All procedures were performed by a consistent team led by a senior urogynaecologist (MA). Since this was the first time RALS was used in The Netherlands, the first 10 surgeries were assisted by an urologist from Belgium experienced in robotic surgery.

2.1. Surgical technique

Patients were operated on using the da Vinci S surgical system (Intuitive Surgical®, Sunnyvale, CA). This system has three interactive instrumental arms and one camera arm. A pneumoperitoneum is created and five laparoscopic ports are placed in a W-figure (Fig. 2A). Patients are positioned in maximal Trendelenburg. The robot is connected to the trocars. The sigmoid is moved to the left side and held with the third interactive arm of the robot (Prograsp®). A retraction suture is placed through the uterus and brought out of the abdominal wall (Fig. 2B,C). Before starting the procedure a 30-degree laparoscope is used to maximise the view of the promontory region. A bipolar grasper (Maryland®) and monopolar scissors are then used. After visualisation of the right ureter the procedure is started. A peritoneal incision is made over the sacral promontory, dissection is performed until the anterior longitudinal ligament is reached (Fig. 2D). At this point a zero-degree laparoscope is introduced. From the promontory a tunnel through the peritoneum is created until the sacro-uterine ligament region is reached (Fig. 2E). A vaginal flat retractor is then used by the assistant to push up the posterior vaginal wall and the posterior fornix. This facilitates dissection of the recto-vaginal plane. The vaginal retractor is then pushed into the anterior fornix to dissect the bladder and anterior vaginal plane. The dissection must be performed at the level of the trigone and should be relatively bloodless: otherwise, consider that this may be a false route. A non-absorbable polypropylene monofilament mesh (Gynemesh, Gynecare) was used (Fig. 2F). The first mesh is placed between the vagina and the rectum and the second mesh between the vagina and the bladder.

The mesh is placed tension-free and special attention given to maintaining correct vaginal length and anatomical position. The broad ligament is opened on the right side and the anterior mesh is taken through this opening (Fig. 2G). The anterior and posterior meshes are combined and drawn through the peritoneal tunnel which was created earlier. The distal end of both meshes is fixed on the anterior longitudinal ligament of the sacrum with one or two non-absorbable sutures (Mersilene 0 was used) (Fig. 2H). The peritoneum is then re-approximated over the mesh and closed with absorbable sutures (Fig. 2I).

Patients characteristics (N=50)		
Age	57,7 (36-77)	
BMI	25,8(20,3–35,2)	
Parity	2,3 (0-7)	
Uterine prolapse grade	*preoperative*	*postoperative*
0	0 (0%)	43 (86%)
1	0 (0%)	7 (14%)
2	0 (0%)	0 (0%)
3	22 (44%)	0 (0%)
4	28 (56%)	0 (0%)
Anterior compartment grade		
0	8 (16%)	39 (78%)
1	6 (12%)	4 (8%)
2	6 (12%)	6 (12%)
3	29 (58%)	0 (0%)
4	1 (2%)	0 (0%)
Posterior compartment grade		
0	14 (28%)	42 (84%)
1	21 (42%)	7 (14%)
2	9 (18%)	1 (2%)
3	6 (12%)	0 (0%)
4	0 (0%)	0 (0%)

Fig. 1. Patients characteristics. Baden–Walker Classification used for pre- and postoperative grading.