Vaginal Hysterectomy and Sacrospinous Colpopexy for Uterovaginal Prolapse: Anatomical and Functional Outcomes

Ayman Qatawneh[1] MD

Abstract

Objective: The surgical management of pelvic organ prolapse requires a combination of techniques. This study evaluated the anatomical outcomes, functional outcomes and complications of vaginal hysterectomy and sacrospinous colpopexy in women with uterovaginal prolapse.

Methods: We retrospectively evaluated 85 women who underwent vaginal hysterectomy and sacrospinous colpopexy over a period of 3 years. The primary outcome measures included anatomical outcome success rates (as assessed by pelvic organ prolapse quantification, POP-Q), pelvic floor function outcomes and complication rates.

Results: At a mean follow-up duration of 35 months (range: 12-60), the overall objective success (for all compartments) was 81% (69/85), while the objective success rates for the anterior, posterior and apical compartments were 82% (70/85), 89% (76/85) and 92% (78/85). Respectively, there were no stage 3 or 4 recurrences at any site. Overactive bladder (OAB) symptoms improved significantly following the surgery, while new-onset stress urinary incontinence occurred in 5 patients. There was no significant change in sexual activity or dyspareunia. Surgical complications were minor.

Conclusions: The combination of vaginal hysterectomy and sacrospinous colpopexy for the treatment of uterovaginal prolapse is reasonably effective in restoring pelvic anatomy and results in favourable pelvic function with an acceptable complication rate.

Keywords: Uterovaginal Prolapse, Sacrospinous Colpopexy, Vaginal Hysterectomy.

(J Med J 2013; Vol. 47 (4):331-339)

Received	***Accepted***
August 20, 2012	*June 11, 2013*

Introduction

Pelvic organ prolapse is a common problem among aging women. Approximately 50% of parous women have been diagnosed with pelvic organ prolapse [1], and the lifetime risk for surgical intervention at the age of 80 is 11% [2]. Vaginal hysterectomy in combination with preventive procedures for future vault prolapse is considered the primary procedure for cases of uterine descent [3]. Sacrospinous ligament fixation of the vaginal apex is a

Assistant Professor, Department of Obstetrics and Gynaecology, Faculty of Medicine. The University of Jordan, Amman, Jordan

**** Correspondence should be addressed to:***
Ayman Qatawneh
P.O. Box 2289, Amman 11910, Amman, Jordan
E-mail: aymenfida@yahoo.com

widely used procedure. It was originally developed as a therapeutic management of post-hysterectomy vaginal vault prolapse [4-5]. The indications for the procedure have recently been expanded to include its use for uterovaginal prolapse among patients who have received a vaginal hysterectomy and whose uterosacral-cardinal ligament complex seems insufficient to support the vaginal apex [6-7].

This study reviews our experience with sacrospinous colpopexy performed at the time of vaginal hysterectomy over a period of 3 years and discusses the anatomical and functional outcomes obtained, as well as the safety of the procedure.

Materials and Methods

Women with symptomatic uterovaginal prolapse who underwent a combination of vaginal hysterectomy and sacrospinous colpopexy between January 2006 and December 2008 at the Gynaecology Department of Jordan University Hospital were retrospectively evaluated. The only inclusion criterion was as follows: stage 2 or greater uterovaginal prolapse, which was based on the pelvic organ prolapse quantification system (POP-Q) [8]. Women who requested that their uterus be preserved were excluded. Ethical approval was obtained from the local ethics committee at the University of Jordan.

***Surgical technique*:** Patients received surgical intervention under general or spinal anaesthesia while in the lithotomy position. Vaginal hysterectomy was completed first with high ligation of any enterocele sac and anterior vaginal wall repair. Sacrospinous colpopexy was performed as described by Nichols [9]. The posterior vaginal wall was incised longitudinally from the introitus to the vaginal apex. Using sharp dissection, the vaginal epithelium was dissected from the rectovaginal fascia, and the rectum was reflected medially. The perirectal space was opened, and the dissection continued toward the ischial spines. A Miya hook [10] was utilised to deliver three delayed absorbable polydioxanone sutures (Ethicon, Somerville, NJ, USA) through the right sacrospinous ligament, 1.5 cm medial to the ischial spine to suspend the vaginal apex. The rectovaginal fascia was plicated in continuity with the perineum, and the vaginal incision was closed as previously described [11]. A vaginal pack was left overnight, and an indwelling catheter was maintained for 24 hours postoperatively. Patients who failed a voiding trial following catheter removal were taught to perform clean intermittent self-catheterisation. All participants received preoperative intravenous antibiotics (cefuroxime 1 g) and low-molecular weight heparin as antithrombotic prophylaxis.

Demographics, history of previous prolapse surgeries, the preoperative pelvic organ prolapse quantification system (POP-Q) score and peri-operative information, including operating time, blood loss, length of the inpatient stay, the duration of catheter use, time to return to activities of daily living and immediate and short-term complications, were collected. Postoperative evaluation occurred at 6 weeks after surgical intervention and every 6 months thereafter and included a pelvic examination with POP-Q assessment; patient satisfaction on a 0 to 10 visual analogue scale was also obtained. Functional outcomes were assessed by comparing pre- and postoperative pelvic floor symptoms related to bladder and sexual function.

Statistical Analysis

Analyses were performed using the Statistical Package for Social Sciences (SPSS for Windows, release 16, Chicago, IL, USA). Descriptive statistics were used to analyse demographic and peri-operative data. Continuous variables were compared using the paired *t* test, and categorical variables were compared using the chi-square test or the McNemar test. P-values <0.05 were considered statistically significant for all comparisons.

The primary outcome measure for this study was the objective success rate of the procedure, which was defined as having stage 2 prolapse or less for any compartment. Secondary outcome measures included the subjective success rate, which was defined as the patient's feeling that prolapse had not recurred, patient satisfaction, functional (bladder and sexual) outcomes and complication rates.

Results

Between January 2006 and December 2008, 85 women underwent the above-mentioned surgery. A concomitant TVT-O™ (Ethicon, Somerville, NJ, USA) procedure was performed in 15 women with urodynamic stress urinary incontinence (SUI). Demographic and peri-operative data are summarised in table (1).

At a mean follow-up duration of 35 months (range, 12-60), the overall objective success (for all compartments) was 81% (69/85), while the objective success of the anterior, posterior and apical compartments was 82% (70/85), 89% (76/85) and 92% (78/85), respectively. There were no stage 3 or 4 recurrences at any site. The pre- and post-operative POP-Q stages are detailed in table (2). POP-Q assessments improved significantly following the surgery, as demonstrated in table 3. The subjective success rate was 89% (76/85), and the mean (±SD) patient satisfaction was 8.5 (±2.1).

Table 1. Patient demographics and peri-operative data (n=85 women)

Demographic and peri-operative data	Mean±SD	Range
Age (years)	56±8.9	38-78
Parity (n)	6±3	1-15
BMI (kg/m^2)	29.7±3.4	24-42
Menopause (n)	53(62%)	
HRT (n) Previous prolapsed surgery (n)	7(13%) 22(26%)	
Operating time (min)	85±23	60-150
Blood loss (ml)	281±225	50-1000
Inpatient days	4.3±1.4	2-9
Catheter days	1.9±1.3	1-14
Time to return to activities of daily living (weeks)	6±1.8	3-10

SD; standard deviation, BMI; Body Mass Index, HRT; Hormone Replacement Therapy.

SUI was cured for all 15 patients who underwent the TVT-O™ procedure as part of their surgery. Of the 70 patients with no pre-existing symptoms of SUI, 5 required subsequent sub-urethral tape for postoperative SUI. Overactive bladder (OAB) symptoms (e.g., urinary frequency, urgency with or without urge urinary incontinence) improved significantly following the surgery, with 16 patients being cured, 19 continuing to have OAB symptoms and 3 developing new-onset OAB symptoms. None of the patients received medical therapy for their pre-operative OAB symptoms; however, all 22 post-operative patients with OAB received medical treatment. One patient had persistent voiding dysfunction, while 2 had new-onset symptoms, all of which required self-catheterisations for a maximum of 2 weeks. Sexual activity and dyspareunia did not change significantly after surgical intervention. Only 3 patients had pre-operative

dyspareunia, one continued to have dyspareunia despite intervention, and 6 developed new-onset dyspareunia. The functional outcomes are detailed in table (4).

Table 2. Overall and compartment specific pelvic organ prolapse quantification (POP-Q) stages at baseline and follow-up

POP-Q Stage	Baseline (n=85) n(%)	Follow-up (n=85) n(%)
Overall		
Stage 0	0	30(35)
Stage 1	0	39(46)
Stage 2	23(27)	16(19)
Stage 3	51(60)	0
Stage 4	11(13)	0
Anterior		
Stage 0	0	25(29)
Stage 1	1(1)	45(53)
Stage 2	20(24)	15(18)
Stage 3	56(66)	0
Stage 4	8(9)	0
Posterior		
Stage 0	0	40(47)
Stage 1	5(6)	36(42)
Stage 2	32(37)	9(11)
Stage 3	44(52)	0
Stage 4	4(5)	0
Uterine or vault	0	32(38)
Stage 0	3(4)	46(54)
Stage 1	25(29)	7(8)
Stage 2	46(54)	0
Stage 3	11(13)	0
Stage 4		

One patient had an estimated blood loss of 1000 ml during vaginal hysterectomy, which required two units of blood transfusion. Five patients had a urinary tract infection, and all responded to antibiotic therapy. No bladder or rectal injury occurred intra-operatively. Four patients developed right-sided buttock pain, which was controlled using simple analgesics and was gradually resolved within 6 weeks after surgery. Post-operatively, two patients developed a vault haematoma, which was detected as a 5 cm diameter collection on ultrasound that required evacuation under anaesthesia. There were no thromboembolic events. Three patients had post-operative voiding dysfunction (residual urine >100 ml), which required self-catheterisations; this normalised at a maximum of 2 weeks post-intervention. One patient developed mild persistent vaginal bleeding; exploration under anaesthesia revealed partial separation of the anterior vaginal wall for which re-suturing of the separated edges was performed, and blood transfusion was not required. Complications are detailed in table (5).

Table 3. Pelvic organ prolapse quantification (POP-Q) measurement at pre-operative and post-operative follow-up (n=85 women)

Point	Pre-operative	Post-operative	P value
Ba	4.1±2.1	-1.9±1.5	<0.001
Bp	3.8±2.3	-2.3±0.8	<0.001
C	4.8±2.4	-5.8±2.2	<0.001

Data listed as the mean ± standard deviation.
Ba anterior wall, most dependent part (cm); Bp posterior wall, most dependent part (cm); C cervix or vaginal cuff (cm)

Re-operation for a recurrent prolapse and post-operative stress urinary incontinence during the follow-up period included 4 anterior vaginal wall mesh repairs, 3 abdominal sacrocolpopexies and 5 sub-urethral tapes for de novo SUI. Nine out of the 16 recurrences (56%) did not report recurrence of prolapse symptoms and elected not to have further repair.

Discussion

This study found an 81% objective success rate for all compartments at an average follow-up duration of 35 months after vaginal hysterectomy, anterior vaginal wall repair, sacrospinous colpopexy and posterior fascial plication. All of the recurrences were POP-Q

stage 2 or less, and the majority were not bothersome enough to warrant reoperation. The primary objective of sacrospinous colpopexy is to correct level 1 defects, which are represented by the parametrial ligaments that continue down to the sides of the upper vagina as the paracolpium [12], and damage to this level of support will lead to apical prolapse. This goal was achieved in 92% of patients in our study, which is consistent with previous large studies that have reported similarly high success rates in maintaining vault support. Cruikshank [13] retrospectively demonstrated a 94% success rate with respect to apical support after sacrospinous colpopexy in a group of 695 patients, with a mean follow-up duration of 3.6 years. Lovatsis [14] retrospectively reviewed 293 patients after sacrospinous colpopexy and reported a 97% cure rate one year after surgery. The incidence of recurrent vault prolapse has varied from 0 to 12% in previous studies [5,6,9,15].

Table 4. Functional outcomes

Symptom	Pre-operative	Cured	Persisted	De novo	Post-operative	P value
SUI	15(18)	15	0	5	5(6)	0.032*
OAB	35(41)	16	19	3	22(26)	0.002*
Incomplete bladder emptying	2	1	1	2	3	NS
Sexually active dyspareunia	47(55) 3(6[a])	2	1	6	45(53) 7(16[a])	NS NS

Values are n(%)
SUI, Stress urinary incontinence. OAB, Overactive bladder, NS, Not significant.
[a] value in brackets is the percentage of sexually active women
[*] Statistically significant.

Cystocele was the most frequent (18%) recurrent pelvic support defect, which can be explained by the vaginal retroversion produced by sacrospinous colpopexy, where posterior deviation of the genital access exposes the anterior vaginal wall to increased abdominal pressure, thus favouring its descent [12]. In a larger and longer follow-up study, Paraiso et al [15] described a 37% cystocele rate after 243 women had undergone sacrospinous colpopexy at a mean follow-up of 74 months. Prolapse of the anterior vaginal wall was the most frequent late complication of sacrospinous colpopexy [16-17].

Sacrospinous colpopexy seems to be effective in the long-term management of rectocele and is associated with low failure rates. In the present study, 11% of patients developed rectocele after surgery. However, most of those patients were asymptomatic and did not require further repair. Maher et al [18] reported a posterior vaginal wall prolapse recurrence rate of 19% after sacrospinous colpopexy in a randomised trial comparing abdominal sacrocolpopexy and sacrospinous colpopexy. They concluded that women with posterior and vault prolapse may be best treated with sacrospinous colpopexy, while those with predominating anterior and vault prolapse are best treated with abdominal sacrocolpopexy.

The re-operation rate for a recurrent prolapse in the present study was 8% (7/85), which is

comparable to the 7.5% re-operation rate reported in the study by Penalver et al [19]. In a review of 22 studies involving 1062 patients who had undergone sacrospinous fixation [20], the re-operation rate was only 3%, although most of the studies in that review had shorter follow-up periods.

Table 5. Peri-operative complications (n=85 women)

Complication	n (%)
Blood transfusion	1 (1)
Urinary tract infection	5 (6)
Bladder injury	0
Rectal injury	0
Vault haematoma	2 (2)
Thromboembolic events	0
Buttock pain	4 (5)
Re-suturing of anterior vaginal wall	1 (1)
Voiding difficulty	3 (4)

Complications in our series were infrequent and temporary. Urinary tract infections, voiding dysfunction and right-sided buttock pain (temporary sciatic neuralgia) were the most common complications. Most of the cases of urinary tract infections and the 2 cases of new-onset voiding dysfunction occurred in patients who underwent both sacrospinous colpopexy and TVT-O™. These complications were relevant to the women who experienced them; however, they had no bearing on long-term results, as the symptoms eventually resolved completely. There were higher rates of post-operative voiding dysfunction and urinary tract infections in the group of patients who received a combination of vaginal surgery and TVT [21].

Buttock pain or numbness over the posterolateral aspect of the thigh can occur following sacrospinous colpopexy. The rates of this complication vary between 1 and 30% [7,9,14,16]. This complication is thought to be due to injury of the perforating cutaneous nerve or the posterior femoral cutaneous nerve, which runs behind or through the sacrospinous ligament. In our series, 4 patients (5%) had mild pain controlled using simple analgesics and resolved within 6 weeks. There was a low incidence of this, as we placed the sutures more superficially in the ligament than what has been previously described [22].

While the high cure rate for SUI in our study can be attributed to the TVT-O™ procedure, the significant improvement in OAB symptoms observed may be related to the combined effect of anterior vaginal wall repair and sacrospinous colpopexy on prolapse reduction, as both of these interventions have previously been reported to have a positive effect on OAB symptoms [15,23]. The incidence of new-onset SUI encountered in our study was 7% (5/70), which is consistent with the incidence of new-onset SUI following sacrospinous colpopexy reported in previous studies [6,9,14,16,19].

Traditional vaginal repair at the time of vaginal hysterectomy is unlikely to achieve long lasting vaginal vault support and a functioning vagina, which can lead to dyspareunia [24]. Sacrospinous colpopexy, however, restores vaginal depth and maintains the length of the vagina, particularly in a woman who would like to retain sexual function. Sexual function was maintained in almost all sexually active women in the present study. Dyspareunia, which developed after surgery in 6 patients, was not related to the sacrospinous colpopexy; rather, it was associated with introital narrowing caused by the concomitant perineorrhaphy.

The limitations of the study include its retrospective design, the lack of a control group (which would ideally include women allocated to uterine preservation or hysterectomy), and the lack of validated questionnaires to assess functional outcomes and quality of life, which are not available in the Arabic language. The strengths of the study are its reasonably large population size of 85 women and the relatively long period of follow-up.

In conclusion, the combination of vaginal hysterectomy and sacrospinous colpopexy for the treatment of uterovaginal prolapse is reasonably effective in restoring pelvic anatomy, achieving bladder function and maintaining sexual function. This combination is associated with an acceptable complication rate. A prospective trial with validated Arabic language pelvic floor questionnaires is necessary.

Disclosure of interests

The author does not have any conflicts of interest.

Acknowledgements

The author would like to thank Jordan University Hospital for supporting this research.

References

1. Slieker-ten Hove MCP, Vierhout M, Bloembergen H, Schoemaker G Distribution of POP in the general population; prevalence, severity, etiology and relation with the function of pelvic floor muscles. 2004; ICS Paris.
2. Olsen AL, Smith VJ, Bergstrom JO, Colling JC, Clark AL. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. Obstet Gynecol 1997;89:501-6.
3. Swati JHA, Moran PA. national survey of prolapse in the UK. Neurol Urodyn 2007; 26: 325-331.
4. Sze EHM, Karram MM. Transvaginal repair of vault prolapse: a review. Obstet Gynecol. 1997; 89:466-75.
5. Richter K, Albrich W. Long term results following fixation of the vagina on the sacrospinal ligament by the vaginal route (vaginaefixatio sacrospinalis vaginalis). Am j obstet Gynecol 1981;141:811-816.
6. Morley GW. In discussion of: Cruikshank SH, Cox DW. Sacrospinous ligament fixation at the time of transvaginal hysterectomy. Am J Obstet Gynecol 1990; 162: 1611-9.
7. Cruikshank SH. Sacrospinous fixation: Should this be performed at the time of vaginal hysterectomy? Am J Obstet Gynecol 1991; 164: 1072-6.
8. R.C. Bump, A. Mattiasson and K. Bø et al., The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction, Am J Obstet Gynecol, 1996; 175: 10-17.
9. Nichols DH. Sacrospinous fixation for massive eversion of the vagina. Am j Obstet Gynecol. 1982;142:901-4.
10. Miyazaki FS. Miya Hook ligature carrier for sacrospinous ligament suspension. Obstet Gynecol 1987;70:286-288.
11. Maher CF, Qatawneh AM, Baessler K, Schluter PJ. Midline rectovaginal fascial plication for repair of rectocele and obstructed defecation. Obstet Gynecol, 2004; 104:685-689.
12. Delancey JO. Anatomic aspects of vaginal eversion after hysterectomy. Am j Obstet Gynecol. 1992;166: 1717-1728.
13. Cruikshank SH, Muniz M. Outcome study: a comparison of cure rates in 695 patients

undergoing sacrospinous ligament fixation alone and with other site-specific procedures, a 16 year study. Am j Obstet Gynecol. 2003;188: 1509-1515.

14. Lovatsis D, Druz HP. Safety and efficacy of sacrospinous vault suspension. Int Urogynecol J Pelvic Floor Dysfunct 2002;13: 308-313.
15. Paraiso MF, Ballard LA, Walters MD, Lee JC, Mitchinson AR. Pelvic support defects defects and visceral and sexual function in women treated with sacrospinous ligament suspension and pelvic reconstruction. Am J Obstet Gynecol 1996; 175:1423-1430.
16. Carey MP, Slack MC. Transvaginal sacrospinous colpopexy for vault and marked uterovaginal prolapse. Br J Obstet Gynaecol. 1994;101: 536-40.
17. Holley RL, Varner RE, Gleason BP, Apffel LA, Scott S. Recurrent pelvic support defects after sacrospinous ligament fixation for vaginal vault prolapse. J Am Coll Surg 1995; 180: 444-8.
18. Maher CF, Qatawneh A, Dwyer PL, Carey MP, Cornish A, Schluter P. Abdominal sacral colpopexy for vaginal vault prolapse. A prospective randomized trial. Am J Obstet Gynecol 2004; 190: 20-26.
19. Penalver M, Mekki Y, Lafferty H, Escobar M, Angioli R. Should sacrospinous ligament fixation for the management of pelvic support defects be part of a residency program procedure? The university of Miami experience. Am J Obstet Gynecol 1998;178: 326-9.
20. Sze EHM, Karram MM. Trans-vaginal repair of vault prolapse: a review. Obstet Gynecol. 1997; 89:466-75.
21. Soloko Al, Jelovsek JE, Walters MD. Incidence and predictors of prolonged urinary retention after TVT with and without concurrent prolapse surgery. Am J Obstet Gynecol 2005;192: 1537-1543.
22. Hefni M, El-Toukhy T. Sacrospinous colpopexy at vaginal hysterectomy: methods, results and follow-up in 75 patients. J Obstet Gynaecol 2000;20(1):58-62.
23. Aigmueller T, Riss P, Dungl A, Bauer H. Long-term follow-up after vaginal sacrospinous fixation: patient satisfaction, anatomical results and quality of life. Int Urogynecol J Pelvic Floor Dysfunct 2008; 19 (7): 965-9.
24. Khan M, Stanton S. Posterior colporrhaphy: its effect on bowel and sexual function. Br J Obstet Gynaecol. 1997; 104: 82-86.

استئصال الرحم بطريق المهبل وتثبيت المهبل للرباط العجزي الشوكي في حالات تدلي الرحم المهبلي: النتائج التشريحية والوظيفية

أيمن قطاونه

أستاذ مساعد، قسم النسائية والتوليد، كلية الطب، الجامعة الأردنية، عمان، الأردن

الملخص

الهدف: إن اجراء العمليات الجراحية في حالات تدلي الرحم المهبلي تتطلب مزيجا من التقنيات. هذه الدراسة تقيم النتائج التشريحية والوظيفية ومضاعفات استئصال الرحم بطريق المهبل مع تثبيت المهبل للرباط العجزي الشوكي في حالات تدلي الرحم المهبلي.

الطريقة: هذه دراسة استعادية شملت 85 امرأة خضعن لجراحة استئصال الرحم بطريق المهبل وتثبيت المهبل للرباط العجزي الشوكي خلال فترة 3 سنوات. كانت تدابير النتيجة الرئيسة: معدل النجاح تشريحيا (التقدير الكمي لتدلي جهاز الحوض) ونتائج وظائف قاع الحوض والمضاعفات.

النتائج: بعد المتابعة مدة 35 شهراً (المدى 12–60)، كانت نسبة النجاح التشريحي للعمليه الجراحيه 81٪ (85/69) بشكل عام. نسبة النجاح في جدار المهبل الأمامي، الخلفي والقمي 82٪ (85/70)، 89٪ (85/76) و92٪ (85/78) على التوالي. لم يكن هناك تجدد حدوث التدلي المهبلي من الدرجة 3 أو 4. وقعت بداية جديدة للسلس البولي الإجهادي في 5 مرضى. تحسنت أعراض فرط نشاط المثانة بشكل ملحوظ بعد الجراحة. لم يتغير النشاط الجنسي وعسر الجماع بشكل كبير. وكانت هناك مضاعفات جراحية بسيطة.

الاستنتاجات: إن الجمع بين استئصال الرحم بطريق المهبل وتثبيت المهبل للرباط العجزي الشوكي لعلاج تدلي الرحم المهبلي يعد جراحة فعالة بشكل معقول في إعادة تشريح قاع الحوض ووظيفته، مع مضاعفات مقبولة.

الكلمات الدالة: تدلي الرحم المهبلي، تثبيت المهبل للرباط العجزي الشوكي، استئصال الرحم بطريق المهبل.