ORIGINAL ARTICLE

Tension-free vaginal mesh for the treatment of pelvic organ prolapse in Chinese women

HL Fan 范曉蘭
Symphorosa SC Chan 陳丞智
Rachel YK Cheung 張優嘉
Tony KH Chung 鍾國衡

Objective To assess perioperative and short-term outcomes after tension-free vaginal mesh repair of pelvic organ prolapse in local Chinese women.

Design Case series.

Setting The urogynaecology unit of a university teaching hospital in Hong Kong.

Patients All women with stage III or more pelvic organ prolapse who underwent tension-free vaginal mesh repair with or without vaginal hysterectomy from May 2007 to June 2011.

Main outcome measures Perioperative and short-term outcomes.

Results In all, 47 women underwent the procedure during the study period. The mean operating time was 94 minutes, the mean estimated blood loss was 163 mL, and the mean hospital stay was 4 days. Four patients had visceral injuries, all of which were identified and repaired during the operation; all four patients recovered uneventfully. The mean duration of follow-up was 25 (standard deviation, 13) months. Pelvic organ prolapse quantification improved significantly; nine (19%) of the patients had recurrent stage II prolapse but only one was symptomatic, six (13%) had postoperative mesh exposure, three of whom underwent mesh excision. There were five (11%) who had de-novo urodynamic stress incontinence, which was mostly mild and managed conservatively. Overall 91% (43/47) were satisfied with their operative outcome.

Conclusions The success rate of tension-free vaginal mesh repair for the treatment of pelvic organ prolapse in local Chinese women was comparable to rates reported internationally. There was a high degree of subjective satisfaction with the procedure. There were low rates of mesh exposure and de-novo stress incontinence that was mostly asymptomatic or mild.

New knowledge added by this study

- This is the first report of outcomes following tension-free vaginal mesh for the treatment of pelvic floor prolapse in local Chinese women.
- High rates of patient satisfaction (>90%) and success (>80%) were noted.
- Postoperative mesh exposure was usually asymptomatic. De-novo stress incontinence was about 10% but usually mild.

Implications for clinical practice or policy

- Tension-free vaginal mesh repair can be offered to appropriate Chinese women for the management of the pelvic organ prolapse. The short-term results are reassuring whilst long-term outcomes are awaited.

Key words
Pelvic organ prolapse; Surgical mesh; Treatment outcome; Urinary incontinence, stress

Hong Kong Med J 2013;19:511-7
DOI: 10.12809/hkmj133948

Department of Obstetrics and Gynaecology, Faculty of Medicine, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong
HL Fan, MB, ChB
SSC Chan, MB, ChB, FHKAM (Obstetrics and Gynaecology)
RYK Cheung, MB, ChB, FHKAM (Obstetrics and Gynaecology)
TKH Chung, MD, FRCOG ad eundem

Correspondence to: Dr SSC Chan
Email: symphorosa@cuhk.edu.hk

Introduction

Pelvic organ prolapse (POP) is a condition commonly affecting parous women.[1] It has an adverse impact on the quality of life and may even give rise to hydronephrosis.[2] Women having complications using vaginal ring pessaries are increasingly likely to choose surgical treatment.[3] According to the Hong Kong College of Obstetricians and Gynaecologists territory-wide audit in 2004, patient numbers having POP surgery in Hong Kong increased consistently from 1994 to 2004.[4]

經陰道無張力人工網膜植入術治療患有盆腔器官脫垂的華籍婦女

目的 評估為患有盆腔器官脫垂的華籍婦女進行經陰道無張力人工網膜植入術的圍手術期和短期結果。

設計 病例系列。

安排 香港一所大學教學醫院的泌尿婦科部門。

患者 2007年5月至2011年6月期間，所有進行經陰道無張力人工網膜植入術的第III期或以上盆腔器官脫垂的女性患者，其中部份經陰道進行子宮切除術。

主要結果測量 圍手術期和短期結果。

結果 研究期間共47名女性接受手術，平均手術時間94分鐘，平均估計失血量163 mL，平均住院4天。4名患者有內臟損傷，均在手術過程中被發現繼而修復，她們都順利康復。平均跟進時間為25個月（標準差13個月）。盆腔器官脫垂量化有顯著改善；9名患者（19%）有復發性II期脫垂，但只有1人出現症狀；6名患者（13%）於術後有網膜暴露的情況，其中3人進行網狀切除術。5名患者（11%）有尿動力學的壓力性尿失禁，其中大部份屬溫和症狀，遂施以保守治療。總體而言，91%（43/47）患者對手術結果感到滿意。

結論 本地為患有盆腔器官脫垂的華籍婦女進行經陰道無張力人工網膜植入術的成功率可媲美國際文獻數據。大部份病人對手術結果感到滿意。網膜暴露的比率偏低，壓力性尿失禁亦大多無症狀或輕微。

Surgical treatment for POP can be divided mainly into native tissue repairs or mesh repairs. Traditional techniques included mainly anterior and posterior colporrhaphy, McCall culdoplasty, sacrospinous and uterosacral ligament apical vault suspensions. The reported success rates varied.[5] Mesh repair has gained popularity in the past decade. The success of abdominal sacrocolpopexy using mesh for vaginal vault prolapse repair encouraged pelvic surgeons to adopt its use in the repair of POP.[6] With the advent of trans-obturator slings for continence surgery, pelvic surgeons are increasingly familiar with the anatomy around the trans-obturator region. Debodinance et al[7] proposed the tension-free vaginal mesh (TVM) for repairing POP in 2004. The technique was similar to tension-free vaginal tape. By delivering the mesh using trocars through anatomical landmarks such as the obturator membrane or the ischiorectal fossa, it allowed tension-free placement of a polypropylene implant to the pelvic floor to provide prosthetic support.[7]

Vaginal mesh implants used currently are made of type 1 polypropylene mesh. The pore size exceeds 75 μm which allows infiltration by macrophages, fibroblasts, and blood vessels. The mesh is durable and has good elasticity, so that it can conform to the shape of the pelvic floor. Advances in delivery systems allow selective application of anterior, posterior, or total vaginal implants, and the need for hysterectomy is potentially eliminated.

Experience with the use of TVM is increasing but data from Hong Kong are meagre. The aim of this study was therefore to review its perioperative and short-term outcomes in a Hong Kong setting.

Methods

A surgical database of a cohort of patients with POP who underwent TVM alone or combined with vaginal hysterectomy (VH) from May 2007 to June 2011 at a university teaching hospital in Hong Kong was retrospectively analysed. This database was designed for urogynaecological research and contained information on all women managed by the urogynaecology team. Patient demographics comprising age, parity, and medical history (including any past pelvic floor reconstruction surgery) were retrieved. Preoperative symptoms consistent with pelvic floor disorders (prolapse symptoms, incontinence, urgency, frequency, voiding difficulty) were also documented. Physical examination findings included body mass index, and type and degree of POP (as per the POP-Q system).[8] The preoperative urodynamic diagnosis was based on urodynamic studies (UDSs) using appropriate-size vaginal ring pessaries to reduce the prolapse. Perioperative clinical data including operating time, estimated blood loss, intra-operative complications, postoperative febrile morbidity, infection, and hospital stay details were also collected.

We offered this surgical option to women aged more than 60 years suffering from stage 3 or 4 uterine or vaginal vault prolapse. Women with vault prolapse (vault prolapse group) were counselled for total vaginal mesh. Those with uterine prolapse and a prolapsed pelvic floor could opt for vaginal mesh repair only and with conservation of the uterus (mesh-only group), or VH with mesh repair (VH-and-mesh group). Women having UDS-proven urodynamic stress incontinence (USI) could opt for concomitant continence surgery with tension-free transobturator tape surgery (TVT-O).

One dose of prophylactic antibiotics to cover common genital tract organism was given on induction of anaesthesia. No bowel preparation was used. All operations were performed by three urogynaecologists or by urogynaecology subspecialty trainees under supervision. Vaginal mesh surgery was performed according to the originally described techniques, with or without VH.[7] Postoperatively, one piece of long gauze was packed into the vagina for haemostasis for 1 day and a Foley catheter was kept in

situ. Only patients with diabetes mellitus were given a prolonged course of antibiotics after the operation.

Women were followed up 4 months post-surgery, except those having concomitant continence surgery who were followed up 2 months after the operation. All the patients were followed up annually thereafter. Symptoms on POP and urinary symptoms were documented and the patients all had gynaecological examinations to look for recurrence of POP according to POP-Q as well as mesh erosion. Women with postoperative urinary incontinence underwent UDS to assess if there was USI or detrusor overactivity (DO). Each woman's satisfaction was assessed at each follow-up by grading the operative outcome as better, same, or worse (compared with her preoperative condition).

The primary outcome measure was a composite of objective and subjective measures. Objective cure of POP was defined as postoperative POP of less than stage 2, together with a subjective improvement in symptoms after the operation. Secondary outcome measures included operating time, estimated blood loss, length of hospitalisation, surgical complications, adverse events related to the procedure such as mesh erosion, de-novo stress urinary incontinence (SUI), overactive bladder symptoms, USI, and DO.

There were two types of vaginal mesh used, namely the GYNECARE PROLIFT (Ethicon, Somerville, US) and Perigee (American Medical Systems, Minnetonka, US). The manufacturers of the mesh kit did not donate the products used in this trial and had no involvement in this study. Ethics approval for this study was granted by our institution (CRE – 2009.584).

Statistical analyses

Descriptive statistics were used to summarise the women's demographics and perioperative clinical data. The Chi squared test or two-sided Fisher's exact test were used to compare categorical variables. The pre- and post-operative POP-Q assessment was compared using the Wilcoxon signed rank test. A P value of <0.05 was considered statistically significant. Statistical analyses were performed using the Statistical Package for the Social Sciences (Windows Version 18.0; SPSS Inc, Chicago [IL], US).

Results

The 47 women who underwent TVM from May 2007 to June 2011 had a mean (± standard deviation) age of 68 ± 10 years and a mean parity of 4 ± 2 (Table 1). In all, 18 women presented with vault prolapse and 29 with uterine prolapse. Fifteen opted for VH together with mesh repair, while the remaining 14 opted for uterine conservation with mesh repair only. Of 10 women with a history of previous pelvic floor repair, nine (50%) in the prolapse group had failed previous VH and colporrhaphy. One woman had had an unsuccessful laparoscopic hysteropexy and opted for mesh-only surgery with uterus preservation.

Table 1 shows perioperative clinical data. Overall, 81% of the women had stage III or more prolapse in at least one of the compartments; anterior compartment prolapse was the most common (affecting 70%). In the vault prolapse group, it involved the anterior compartment in 61%, the apical compartment in 39%, and the posterior compartment in 17%. In the uterine prolapse group, again anterior and apical compartment prolapses were more common (71-87%) compared with the posterior compartment (50-67%).

In all, 11 (23%) of the women had operations performed under spinal anaesthesia. Among all the women, 32 (68%) had total vaginal mesh repairs, 14 (30%) had only anterior vaginal mesh repairs, and one (2%) had only a posterior vaginal mesh repair. The latter patient had previously undergone an anterior vaginal mesh repair for a cystocele and vault prolapse after a total abdominal hysterectomy. However, she presented with a rectocele 3 years after the anterior and apical compartment repair, and thus only a posterior vaginal mesh was introduced. One third of the women had concomitant continence surgery (TVT-O or TVT-Secur) for USI.

The mean operating time for the VH-and-mesh group was significantly longer than that for the vault prolapse group (136 vs 68 minutes, P=0.03) as well as the mesh-only group (136 vs 81 minutes, P=0.04). The mean intra-operative blood loss was again significantly more in the VH-and-mesh group compared with vault prolapse group (236 vs 108 mL, P=0.007). Overall, the mean hospital stay was 4 days. The mean hospital stay was significantly shorter in the vault prolapse group than VH-and-mesh group (3 vs 4 days, P<0.01). Two women had postoperative fever treated with intravenous antibiotics and stayed in hospital for longer than 7 days. Another woman, with a history of ischaemic heart disease, developed congestive heart failure after surgery and had a prolonged hospital stay.

There were three operative bowel injuries, two in the VH-and-mesh group and one in the mesh-only group (Table 1). There was also one bladder injury. All these injuries occurred in the first half of the series. The bowel injuries, all occurred during dissection of the para-rectal space, were all identified during the operation and repaired with interrupted sutures in two layers; no posterior vaginal mesh was placed. All these women recovered well and did not have other complications. The one bladder injury ensued during dissection of the bladder from the anterior vaginal wall. The site was repaired by fine absorbable suturing in two layers and cystoscopy confirmed that

TABLE 1. Demographics and perioperative clinical data

Demographics/perioperative clinical data	Mean ± standard deviation or No. (%)			
	Overall (n=47)	Vault prolapse group (n=18)	Uterus and pelvic floor prolapse (n=29)	
			VH-and-mesh group (n=15)*	Mesh-only group (n=14)
Baseline characteristics				
Age (years)	68 ± 10	70 ± 10	69 ± 8	66 ± 13
Body mass index (kg/m^2)	27 ± 4	28 ± 4	29 ± 4	25 ± 5
No. of vaginal deliveries	4 ± 2	4 ± 2	4 ± 2	3 ± 2
Histories of pelvic floor repair	10 (21)	9 (50)	-	1†
Histories of continence surgery	2 (4)	2 (11)	-	-
Preoperative pelvic organ prolapse ≥stage III				
Any compartment	38 (81)	12 (67)	14 (93)	12 (86)
Anterior compartment	33 (70)	11 (61)	12 (80)	10 (71)
Apical compartment	31 (66)	7 (39)	13 (87)	11 (79)
Posterior compartment	20 (43)	3 (17)	10 (67)	7 (50)
Current surgery				
Spinal anaesthesia	11 (23)	3 (17)	3 (20)	5 (36)
Total mesh (both anterior and posterior mesh)	32 (68)	10 (56)	10 (67)	12 (86)
Anterior mesh only	14 (30)	7 (39)	5 (33)	2 (14)
Posterior mesh only	1 (2)	1 (6)	-	-
Concomitant continence surgery	15 (32)	3 (17)	9 (60)	3 (21)
Mean operating time (mins)	94 ± 37	68 ± 13	136 ± 32‡	81 ± 18‡§
Mean blood loss (mL)	163 ± 116	108 ± 55	236 ± 138‡	156 ± 114
Intra-operative and perioperative complications and information				
Bowel injury	3 (6)	-	2 (13)	1 (7)
Bladder injury	1 (2)	-	1 (7)	-
Postoperative fever	9 (19)	3 (17)	5 (33)	1 (7)
Urinary tract infection	6 (13)	2 (11)	2 (13)	2 (14)
Mean hospital stay (days)	4 ± 2	3 ± 1	4 ± 2§	4 ± 2

* VH denotes vaginal hysterectomy
† Laparoscopic hysteropexy was performed previously
‡ P<0.05 against vault prolapse group
§ P<0.05 against VH-and-mesh group

the site of injury did not involve the trigone. This patient underwent anterior vaginal mesh placement and recovered uneventfully.

Preoperative and postoperative POP-Q assessment findings are shown in Table 2. There was significant improvement in all three compartments after the operation and the total vaginal length was preserved after all three types of mesh application.

Table 3 shows the treatment outcomes of the women. Overall, the mean duration of follow-up was 25 ± 13 months. Six (13%) cases had postoperative mesh exposure; all were identified within the first postoperative year. In three of these patients, the exposed part of the mesh was excised because of symptoms and failed treatment with local oestrogen cream; the other three patients were asymptomatic and opted for conservative management.

We defined postoperative stage 2 or more prolapse in any one of the compartments as a recurrence of prolapse. Nine (19%) women had such recurrence. Except for one woman who opted for a vaginal ring pessary for prolapse reduction, all the others were asymptomatic or had only minimal prolapse symptoms that warranted no further treatment. There was no statistically significant difference between the three groups in terms of recurrences (P=0.46), although the mesh-only group seemed to have a higher rate (29%).

In eight (17%) of these women who complained of de-novo SUI, five were confirmed to have the

TABLE 2. Pre– and post–POP-Q assessment*

POP-Q†	Overall (n=47)			Vault prolapse group (n=18)			Uterus and pelvic floor prolapse (n=29)					
							VH-and-mesh group (n=15)			Mesh-only group (n=14)		
	Pre	Post	P value	Pre	Post	P value	Pre	Post	P value	Pre	Post	P value
Aa	1.4 ± 1.4	-2.2 ± 1.1	<0.005	0.8 ± 1.1	-2.5 ± 0.8	<0.005	2.3 ± 1.3	-2.1 ± 0.9	<0.005	1.3 ± 0.3	-2.0 ± 1.4	<0.005
Ba	1.8 ± 2.1	-2.5 ± 1.0	<0.005	0.9 ± 1.4	-2.7 ± 0.6	<0.005	3.1 ± 2.5	-2.7 ± 0.3	<0.005	1.8 ± 1.9	-2.2 ± 1.4	<0.005
C	2.2 ± 3.2	-4.6 ± 2.3	<0.005	-0.4 ± 2.6	-5.0 ± 1.5	<0.005	4.3 ± 2.2	-4.8 ± 2.6	<0.005	3.2 ± 2.7	-3.8 ± 2.9	<0.005
Gh	3.8 ± 0.8	3.0 ± 0.6	<0.005	4.0 ± 0.9	3.1 ± 0.6	0.005	3.9 ± 0.9	3.0 ± 0.4	0.004	3.7 ± 0.7	3.1 ± 0.7	0.038
Pb	2.0 ± 0.4	2.1 ± 0.7	0.69	2.1 ± 0.4	2.0 ± 0	0.276	2.1 ± 0.4	2.4 ± 1.3	0.68	1.8 ± 0.5	2.0 ± 0	0.258
TVL	7.2 ± 2.2	6.7 ± 1.6	0.004	6.8 ± 3.3	6.7 ± 1.2	0.078	7.4 ± 1.2	6.1 ± 2.4	0.05	7.6 ± 0.5	7.4 ± 0.8	0.317
Ap	0.1 ± 1.9	-2.4 ± 0.9	<0.005	-1.3 ± 1.3	-2.5 ± 0.9	0.01	1.4 ± 1.7	-2.5 ± 0.5	<0.005	0.5 ± 1.7	-2.3 ± 1.3	<0.005
Bp	0.6 ± 2.7	-2.5 ± 1.0	<0.005	-0.9 ± 1.6	-2.7 ± 0.7	0.04	2.2 ± 3.0	-2.5 ± 0.9	<0.005	0.9 ± 2.4	-2.4 ± 1.3	<0.005
D	1.3 ± 3.3	-4.7 ± 2.2	<0.005	-	-	-	1.4 ± 3.5	-	-	1.3 ± 3.3	-4.7 ± 2.2	<0.005

* Data are shown as mean ± standard deviation

† Point Aa and Ba denotes the anterior compartment, point C and D the apical compartment, Gh genital hiatus, Pb perineal body, TVL total vaginal length, and point Ap and Bp the posterior compartment

TABLE 3. Treatment outcome and follow-up clinical data

Outcome/follow-up clinical data*	Mean ± standard deviation or No. (%)			
	Overall (n=47)	Vault prolapse group (n=18)	Uterus and pelvic floor prolapse (n=29)	
			VH-and-mesh group (n=15)	Mesh-only group (n=14)
Follow-up (months)	25 ± 13	23 ± 12	21 ± 12	32 ± 15
Mesh erosion (%)	6 (13)	3 (17)	2 (13)	1 (7)
Excision of exposed part of mesh	3 (6)	1 (6)	1 (7)	1 (7)
Recurrent POP stage II	4 ± 2	4 ± 2	4 ± 2	3 ± 2
Any compartment	9 (19)	2 (11)	3 (20)	4 (29)
Anterior compartment	6 (13)	1 (6)	3 (20)	2 (14)
Apical compartment	4 (9)	-	1 (7)	3 (21)
Posterior compartment	4 (9)	2 (11)	1 (7)	1 (7)
Postoperative de-novo urinary symptoms	33 (70)	11 (61)	12 (80)	10 (71)
SUI symptoms	8 (17)	2 (11)	3 (20)	3 (21)
De-novo USI†	5 (11)	1 (6)	2 (13)	2 (14)
OAB symptoms	8 (17)	3 (17)	2 (13)	3 (21)
De-novo DO‡	2 (4)	1 (6)	-	1 (7)
Women satisfaction	32 (68)	10 (56)	10 (67)	12 (86)
Same	4 (9)	1 (6)	1 (7)	2 (14)
Better	43 (91)	17 (94)	14 (93)	12 (86)

* POP denotes pelvic organ prolapse, SUI stress urinary incontinence, USI urodynamic stress incontinence, OAB overactive bladder, and DO detrusor overactivity

† These 5 women were inclusive in the 8 women with SUI symptoms above. One in mesh-only group required tension-free transobturator tape surgery due to severe USI

‡ These 2 women were inclusive in the 8 women with OAB symptoms above

problem, of which four had symptoms that improved after pelvic floor muscle training but one had severe USI treated by TVT-O. Of the eight (17%) women with overactive bladder symptoms, two (4%) were confirmed to have DO based on UDS.

Over 90% of women had subjective improvement in their symptoms after TVM. The rest reported no improvement in symptoms, but none reported deterioration. There was no significant difference in subjective postoperative outcomes in the three groups (P=0.54).

Discussion

Intra-operative bowel and bladder injury ensued in 6% and 2% of the patients, respectively. These injuries

occurred during the initial procedures performed by each surgeon and reflected the learning curve for this kind of surgery. Another way to assess the learning curve for the operation is to evaluate operating times. However, our study only recorded the total operating time, which included not only that for mesh insertion but also for other procedures, such as VH, continence surgery, and perineoplasty. Thus, direct comparison of any operating time trends for mesh insertion was not feasible.

It is generally recommended that a vaginal mesh should not be placed in patients with any bowel injury, so as to prevent serious complications such as recto-vaginal fistula. Notably, however, our four patients with visceral injuries did not endure any long-term harm.

We found that after TVM, all compartments were well suspended and there was significant improvement in the post-treatment POP-Q assessment. In most studies, successful treatment was defined by a postoperative POP of ≤stage 1. In all, 81% of our women achieved this, which was comparable to other published data.[9-12] Even though about 20% had an anatomically defined recurrence (POP ≥stage 2), the majority enjoyed subjective improvement in symptoms after the treatment. Only one woman failed to improve after TVM and opted for a ring pessary. In this patient, significant reduction in the hiatus size (point Gh) was due to the effect of concomitant perineoplasty, which is often performed during the same operation. Moreover, the total length of her vagina was maintained and mesh shrinkage was not apparent.

Mesh erosion is reported in about 10% of cases,[5] which is comparable to our figure of 13%. However, not all mesh erosions warrant excision. Only half of our women had symptoms (vaginal bleeding or pain) for which excision was performed in a clinic setting. The rate of dyspareunia after TVM has been reported to be 9 to 15%; the highest being in women with a posterior vaginal mesh.[13-15] In our cohort, only two (5%) women complained of dyspareunia after the operation; such a low rate most likely being due to the majority of our women not being sexually active. Moreover, Chinese women may be more reticent to discuss sexual problems.

The percentage of women with occult USI in the presence of severe POP has been reported to be 60 to 70%.[16-18] Women with severe POP should have preoperative UDS to look for this problem so that concomitant continence surgery can be offered during the same operation. De-novo SUI after TVM in women with negative preoperative UDS could also be as high as 25%.[19] In our series, eight (17%) women developed de-novo SUI after TVM; five were confirmed by UDS, only one of whom underwent subsequent continence surgery. In women with USI, current evidence shows that concomitant TVT performed during correction of POP can effectively prevent postoperative urinary incontinence. We therefore suggest that all women undergoing vaginal mesh surgery should have proper preoperative assessment.[20] However, routine prophylactic concomitant continence surgery is not recommended because of possible acute and long-term surgical complications (voiding difficulty, DO, and recurrent urinary tract infections).[20,21]

On comparing the outcomes of TVM for vault prolapse with those of laparoscopic sacrocolpopexy (LS) in our unit, POP-Q results were comparable although there was a slightly shorter follow-up duration for TVM patients.[22] The recurrence rate of ≥stage 2 prolapse was 11% for TVM and 9% for LS patients, whilst satisfaction rates were both 90%. Overall, the short-term results of TVM were as good as and comparable to those of other series[23] but long-term outcomes are not yet available.

Tension-free vaginal mesh offers the option of uterine conservation. In our cohort of over 600 women undergoing VH for POP repair, we confirmed that the risk of incidental carcinoma of uterine corpus in asymptomatic women was less than 1%. However, in women aged less than 65 years, the implications of uterine conservation surgery on Pap smear surveillance and the risk of future uterine pathology should be explained before offering them surgery.[24]

In women suffering uterine and pelvic floor prolapse, there was more recurrence of POP in the mesh-only group than the VH-and-mesh group, though the difference did not reach statistical significance. Whether conserving the uterus confers a higher risk of prolapse recurrence warrants more research. Currently, another available option is laparoscopy,[25] about which we aim to report in future.

Although TVM provides a promising option for treating women with advanced-stage POP, complications of mesh surgery, though rare, can be serious. This was the subject of a US Food and Drug Administration directive in July 2011. It recommended that all clinicians should have specialised training and experience before offering patients vaginal mesh surgery, and that women should be provided with detailed counselling together with written information and alternative available options.[26]

One of the limitations of our study was the lack of a validated tool for assessing quality of life of these women, including the impact of TVM on sexual activity. However, validated Chinese versions of Pelvic Floor Distress Inventory and Pelvic Floor Impact Questionnaire have been available since 2011.[27] Moreover, there is ongoing validation of the Chinese Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire–Revised version. We plan to report ongoing quality-of-life studies in the future.

Conclusions

The local data focusing on Chinese women showed perioperative results and treatment outcomes comparable to existing reports in the international literature. Tension-free vaginal mesh is a reasonable option to correct POP, especially of the anterior compartment. Short-term results appear satisfactory. However, there are complications such as mesh erosion or de-novo urinary incontinence. Although most of the women had mild symptoms, thorough counselling should be given before the operation.

Declaration

No conflicts of interest were declared by the authors.

References

1. Hendrix SL, Clark A, Nygaard I, Aragaki A, Barnabei V, McTieman A. Pelvic organ prolapse in the Women's Health Initiative: gravity and gravidity. Am J Obstet Gynecol 2002;186:1160-6. cross ref
2. Hui SY, Chan SC, Lam SY, Lau TK, Chung KH. A prospective study on the prevalence of hydronephrosis in women with pelvic organ prolapse and their outcomes after treatment. Int Urogynecol J 2011;22:1529-34. cross ref
3. Chan SS, Cheung RY, Yiu KW, Lee LL, Pang AW, Chung TK. Symptoms, quality of life, and factors affecting women's treatment decisions regarding pelvic organ prolapse. Int Urogynecol J 2012;23:1027-33. cross ref
4. Hong Kong College of Obstetricians and Gynaecologists. Territory-wide O&G audit report 2004. Available from: http://hkcog.obg.cuhk.edu.hk/public/docs/audit/audit_og_report_2004.pdf. Accessed 10 Oct 2012.
5. Maher CM, Feiner B, Baessler K, Glazener CM. Surgical management of pelvic organ prolapse in women: the updated summary version Cochrane review. Int Urogynecol J 2011;22:1445-57. cross ref
6. Maher C, Baessler K, Glazener CM, Adams EJ, Hagen S. Surgical management of pelvic organ prolapse in women: a short version Cochrane review. Neurourol Urodyn 2008;27:3-12. cross ref
7. Debodinance P, Berrocal J, Clavé H, et al. Changing attitudes on the surgical treatment of urogenital prolapse: birth of the tension-free vaginal mesh [in French]. J Gynecol Obstet Biol Reprod (Paris) 2004;33:577-88. cross ref
8. Bump RC, Mattiasson A, Bø K, et al. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. Am J Obstet Gynecol 1996;175:10-7. cross ref
9. De Tayrac R, Gervaise A, Chauveaud A, Fernandez H. Tension-free polypropylene mesh for vaginal repair of anterior vaginal wall prolapse. J Reprod Med 2005;50:75-80.
10. Gauruder-Burmester A, Koutouzidou P, Rohne J, Gronewold M, Tunn R. Follow-up after polypropylene mesh repair of anterior and posterior compartments in patients with recurrent prolapse. Int Urogynecol J Pelvic Floor Dysfunct 2007;18:1059-64. cross ref
11. Rane A, Kannan K, Barry C, Balakrishnan S, Lim Y, Corstiaans A. Prospective study of the Perigee system for the management of cystocoeles—medium-term follow up. Aust N Z J Obstet Gynaecol 2008;48:427-32. cross ref
12. Altman D, Väyrynen T, Ellström Engh M, Axelsen S, Falconer C; Nordic Transvaginal Mesh Group. Anterior colporrhaphy versus transvaginal mesh for pelvic-organ prolapse. N Engl J Med 2011;364:1826-36. cross ref
13. Hinoul P, Ombelet WU, Burger MP, Roovers JP. A prospective study to evaluate the anatomic and functional outcome of a transobturator mesh kit (prolift anterior) for symptomatic cystocele repair. J Minim Invasive Gynecol 2008;15:615-20. cross ref
14. Nguyen JN, Burchette RJ. Outcome after anterior vaginal prolapse repair: a randomized controlled trial. Obstet Gynecol 2008;111:891-8. cross ref
15. Milani R, Salvatore S, Soligo M, Pifarotti P, Meschia M, Cortese M. Functional and anatomical outcome of anterior and posterior vaginal prolapse repair with prolene mesh. BJOG 2005;112:107-11. cross ref
16. Rosenzweig BA, Pushkin S, Blumenfeld D, Bhatia NN. Prevalence of abnormal urodynamic test results in continent women with severe genitourinary prolapse. Obstet Gynecol 1992;79:539-42.
17. Ghoneim KM, Walters F, Lewis V. The value of vaginal pack test in large cystocele. J Urol 1994;152:931-4.
18. Reena C, Kekre AN, Kekre N. Occult stress incontinence in women with pelvic organ prolapse. Int J Gynaecol Obstet 2007;97:31-4. cross ref
19. Kasturi S, Diaz SI, McDermott CD, et al. De novo stress urinary incontinence after negative prolapse reduction stress testing for total vaginal mesh procedures: incidence and risk factors. Am J Obstet Gynecol 2011;205:487. cross ref
20. Liang CC, Chang YL, Chang SD, Lo TS, Soong YK. Pessary test to predict postoperative urinary incontinence in women undergoing hysterectomy for prolapse. Obstet Gynaecol 2004;104:795-800. cross ref
21. Wei JT, Nygaard I, Richter H, et al. A midurethral sling to reduce incontinence after vaginal prolapse repair. N Engl J Med 2012;366:2358-67. cross ref
22. Chan SS, Pang SM, Cheung TH, Cheung RY, Chung TK. Laparoscopic sacrocolpopexy for the treatment of vaginal vault prolapse: with or without robotic assistance. Hong Kong Med J 2011;17:54-60.
23. Milani AL, Withagen MI, Vierhout ME. Trocar-guided total tension-free vaginal mesh repair of post-hysterectomy vaginal vault prolapse. Int Urogynecol J Pelvic Floor Dysfunct 2009;20:1203-11. cross ref
24. Wan OY, Cheung RY, Chan SS, Chung TK. Risk of malignancy in women who underwent hysterectomy for uterine prolapse. Aust N Z J Obstet Gynaecol 2013;53:190-6. cross ref
25. Costantini E, Mearine L, Bini V, Zucchi A, Mearini E, Porena M. Uterus preservation in surgical correction of urogenital prolapse. Eur Urol 2005;48:642-9. cross ref
26. US Food and Drug Administration. FDA Public health notification: serious complications associated with transvaginal placement of surgical mesh in repair of pelvic organ prolapse and stress urinary incontinence, 2008. Available from: http://www.fda.gov/medicaldevices/safety/alertsandnotices/publichealthnotifications/ucm061976.htm. Accessed 13 Oct 2012.
27. Chan SS, Cheung RY, Yiu AK, et al. Chinese validation of Pelvic Floor Distress Inventory (PFDI) and Pelvic Floor Impact Questionnaire (PFIQ). Int Urogynecol J 2011;22:1305-12. cross ref