Total pelvic floor reconstruction versus transvaginal hysterectomy for pelvic organ prolapse: a retrospective cohort

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Summary

Aims: To evaluate the surgical outcomes following total pelvic floor reconstruction (TPFR) and transvaginal hysterectomy (TVH). *Materials and Methods:* This was a retrospective cohort study of all patients who underwent TPFR or TVH repair for pelvic organ prolapse (POP) between January 2005 and January 2011. A total of 251 consecutive women were evaluated prior to, and at two, six, and 12 months after surgery. Anatomy, symptoms, and quality of life were measured using the Pelvic Organ Prolapse Quantification system (POP-Q) and pelvic floor distress inventory (PFDI). The surgical outcomes were compared between groups using Student's t-test and ANCOVA tests ($p < 0.05$). *Results:* Of the 251 patients, 129 had a total pelvic floor reconstruction (TPFR group), and concomitant modified transobturator inside-out tension-free urethral suspension (TVT-O) was used in pelvic floor dysfunction patients with stress urinary incontinence. The patients that underwent vaginal hysterectomy surgery (TVH group) were 122. At two, six, and 12 months, respectively, 12.40% (TPFR group) and 18.85% (TVH group) of the patients were lost to follow-up. There were no significant differences between TPFR group and TVH group for all preoperative variables ($p > 0.05$). The TPFR patients had significantly lower operation time, blood loss, anus exhaust time, remaining catheter time, and the length of stay in hospital ($p < 0.05$). Postoperatively, the recurrence rate in TVH group was higher than that of TPFR group after surgery at six and 12 months ($p < 0.05$). The PFDI score was significantly different between the groups. *Conclusions:* The short-term clinical results suggest that the two surgeries are safe and effective in treating female POP. The patients' quality life was improved, but TPFR technique was more conspicuous for treating POP.

Key words: Total pelvic floor reconstruction; Transvaginal hysterectomy; Quality of life; Prolapse.

Introduction

Pelvic organ prolapse (POP) is a relatively common condition, and around 50% of parous women will have prolapse with symptoms. Lousquy *et al.* have estimated that 30.8% women at 70 years of age will have pelvic problems and approximately 10% women will need a POP repair in their lifetime [1]. A recently updated Cochrane review on surgery for POP showed that total pelvic floor reconstruction with its excellent success rates of 84–99% was associated with a lower vault prolapse and dyspareunia recurrence rate than vaginal sacrospinous colpopexy [2]. Abdominal sacrocolpopexy, which is considered the gold standard for apical prolapse repair, has a higher success rate but at the cost of including higher morbidity and longer operative and recovery time vaginal procedures. The difference in success is attributed to the use of synthetic material. The polypropylene gynecological mesh has been used as fascial strengthening, with tension-free technique, reducing the possibility of relapse, with attempts to merge the benefits of both approaches for prolapse repair [3]. Current opinion suggests that transobturator vaginal tape from inside to outside or tension-free vaginal tape obturator from inside to outside (TVT-O) was described for the first time in 2003 [4].

Apical support of the vagina is the hallmark of pelvic floor surgery and is required to prevent recurrence in other compartments. Furthermore, vaginal hysterectomy at the time of POP surgery has been traditionally recommended, although it remains unclear as to whether this is required or prevents recurrence [5]. Several studies investigating the polypropylene system have reported high short-term success rates, with few intra- and postoperative complications [6]. Because total pelvic floor reconstruction (TPFR) and transvaginal hysterectomy (TVH) have not been directly compared in the literature and it is currently unclear as to the appropriate management of a patient scheduled for total pelvic floor with a uterus in situ. The aim of this retrospective cohort study was to determine whether a difference in peri- and postoperative outcomes existed between patients that underwent TPFR and TVH.

Materials and Methods

This was a retrospective cohort study comparing outcomes for patients that had undergone either TPFR or TVH between January 2005 and January 2011 at the Second People's Hospital of Changzhou, Nanjing Medical University, Changzhou, Jiangsu Province, China, with 251 women aged from 48 to 82 years. Inclusion criteria were as follows: women with stress urinary incontinence lasting for at least two years as diagnosed by clinical evaluation and urodynamics and age > 40 years. Exclusion criteria were as follows: overactive bladder and mental disease, previous surgical and/or pharmacological treatment of POP, predominant or isolated urge incontinence, and serious contraindications to surgical procedures. Patients were excluded from this retrospective analysis if only the anterior or posterior portion of the polypropylene kit was placed, rather than the total vaginal

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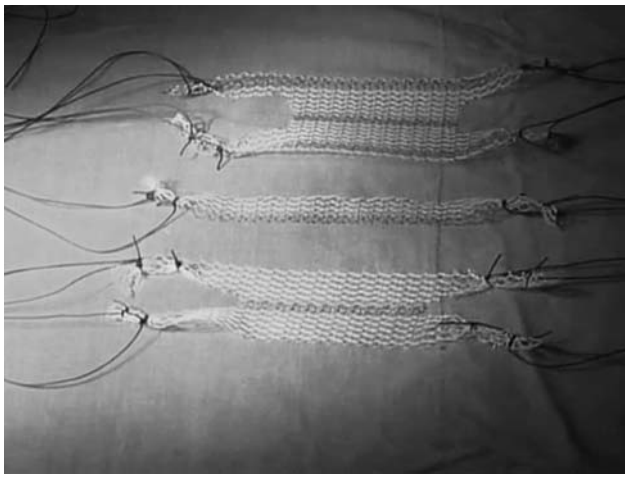

Figure 1. — Polypropylene mesh.

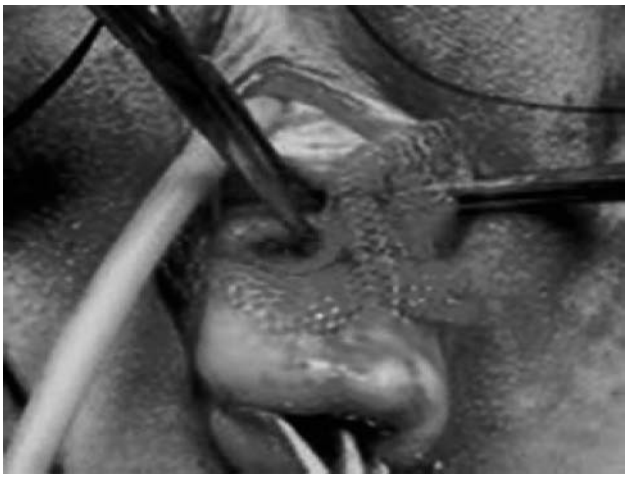

Figure 2. — Implantation of the polypropylene mesh between the urinary bladder and the vagina.

mesh. Patients were also excluded if follow-up after surgery was less than 12 months. Estrogen cream was administered for one or two weeks preoperatively for patients with thin vaginal wall. They agreed to buy a single set for operation, and met the inclusion criteria. All patients were operated on at the Department of Obstetrics and Gynecology, Hospital of Second People's Hospital of Changzhou, Nanjing Medical University (by the same surgeon).

The preoperative assessment consisted of an in-depth interview covering anthropometric data, medical, surgical and obstetric history, symptoms of prolapse, pelvic pain, voiding and defecatory dysfunction, and the impact of the prolapse on daily life (especially sex life). Prolapse was assessed using the International Continence Society (ICS) Pelvic Organ Prolapse Quantification (POP-Q) system. Additional studies included a full urodynamic work-up, a standing stress test, uroflow, and postvoid residual. All patients who were consulting for symptomatic genital pelvic organ prolapse (Grade II and above), who had been informed of their inclusion in the registry and of the technique used, and who had agreed to regular monitoring for 12 months, were included.

Surgical technique. The patient was placed in the lithotomy position and her thighs flexed approximately at 90 degrees. Anesthesia was either epidural or at times general. Antibiotics were administered preoperatively and postoperatively for 24 hours (one gram of cefalozine). A bladder catheter and a vaginal pack were left in place for 24 hours. Post-void residual (PVR) was measured after catheter removal. The technique involves: implantation of a large sheet of polypropylene mesh (10.0 x 3.5 cm) (Figure 1) between the urinary bladder and the vagina in case of cystocele (Figure 2), or a mesh (10.0 x 4.5 cm) was placed between the vagina and the rectum in case of rectocele (Figure 3). The surgical technique has been described elsewhere. In some patients, a modified transobturator inside-out tension-free urethral suspension (TVT-O) procedure was performed through a separate incision at the mid urethra after the mesh procedure for proper positioning and to avoid displacement. The TVT-O procedure was performed according to De Leval [7]. TVH was also described by Ethicon Women's Health and Urology [8].

Patients were scheduled for their postoperative visit at two, six, and 12 months after surgery. Data were entered for the follow-up preoperative basic characteristics: age, body mass index (BMI), number of vaginal deliveries, history of prior incontinence surgery, history of prior prolapse surgery, sexual life, POP quantification (POP-Q) vaginal measurements and stage of vaginal prolapse [9]. The following operative assessments all included: operative time (from beginning to end of anesthesia), estimated blood loss, length of stay in hospital recorded in days, and intraoperative complications. The follow-up postoperative information consisted of: POP-Q vaginal measurements and pelvic floor distress inventory short form 20 (PFDI-20) score. These assessors were not blinded to the type of surgery performed. The aforementioned information was compiled into a single de-identified spreadsheet. A second individual performed a quality assessment of the data collected from the charts of every tenth patient.

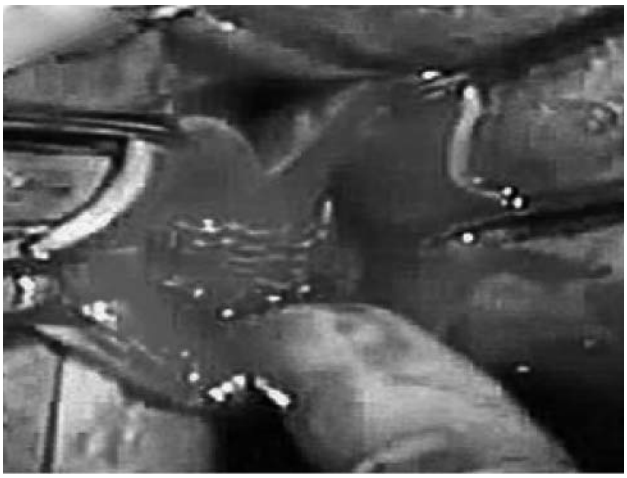

Figure 3. — Implantation the polypropylene mesh between the vagina and the rectum.

Results

A total of 251 charts were identified from January 2005 to January 2011 at the Second People's Hospital of Changzhou, Nanjing Medical University, Changzhou,

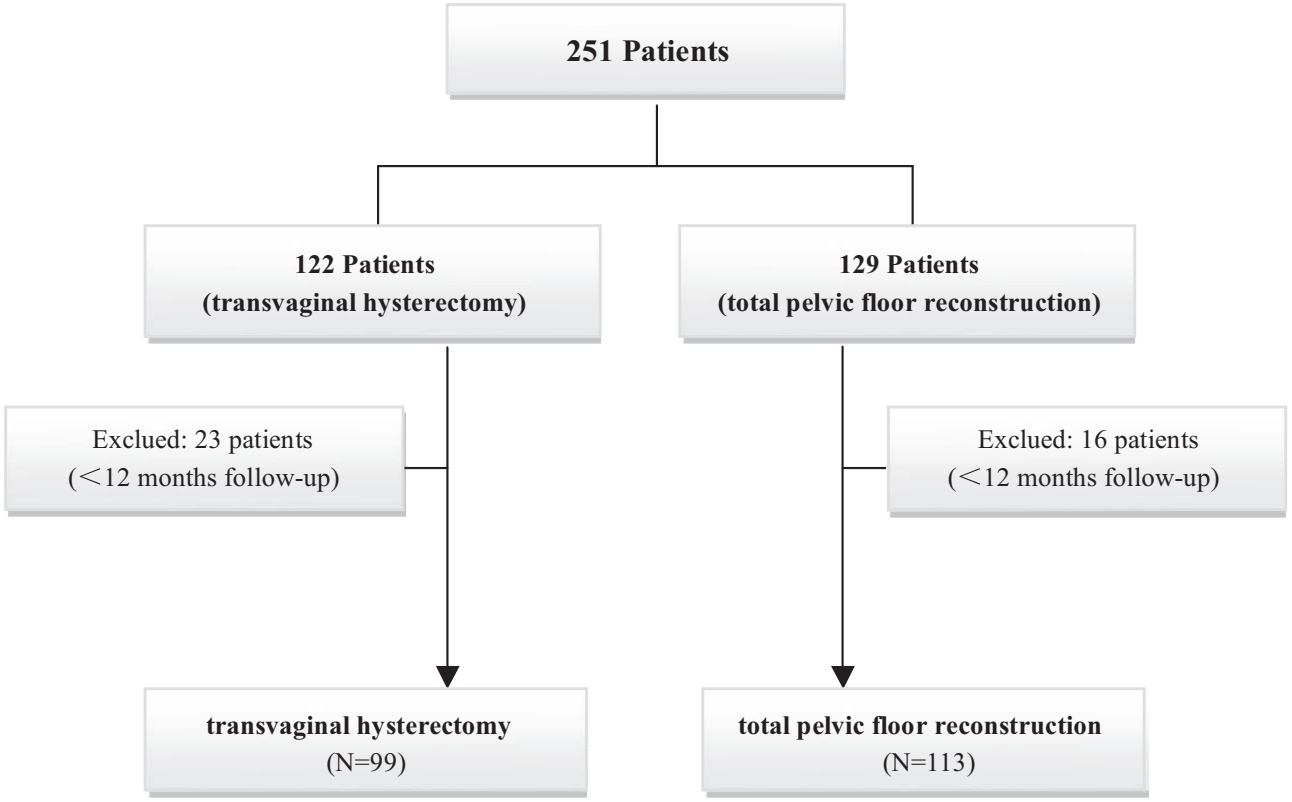

Figure 4. — Patient distribution for the two surgical procedures.

Jiangsu Province, China. Figure 4 depicts patient distribution for each surgical group. All patients attended the month 12 postoperative appointment but 12.40% (TPFR) and 18.85% (TVH) of the patients were lost to follow-up. (Figure 4). The final analyses included 212 patients, with 113 in the TPFR group and 99 in the TVH group (Figure 4). The baseline characteristics of the patients' are shown in Table 1.

Characteristics of the operation

Characteristics of the operation and complications were compared between the two surgical groups and are summarised in Table 2. There were significant differences between the two groups at the time of surgery, blood loss, anus exhaust time, remain catheter time, and length of stay in hospital. Immediately postoperatively, the following complications were observed: In the TPFR group 3 patients had a hematoma and ten patients operated for prolapse developed acute urine retention that resolved after three weeks of intermittent self-catheterization. Two patients presented with urinary tract infection after a total reconstruction repair. Three patients required wide mesh excision for reoperation. Patients undergoing vaginal hysterectomy had slightly more complications (Table 2).

Table 1. — Compares preoperative baseline data between the two surgical procedures. No significant preoperative differences were identified, between the two groups ($p > 0.05$).

	TPFR* (n=113)	TVH* (n=99)	P-value
Age (years)	67.2±8.5	67.8±5.2	*p > 0.05*
BMI (kg/m^2)	27.2±4.3	27.4±3.5	*p > 0.05*
Vaginal deliveries	4.4±1.45	4.4±1.52	*p > 0.05*
Prior incontinence surgery	43 (38%)	35 (35%)	*p > 0.05*
Prior prolapse surgery	57 (50%)	41 (41%)	*p > 0.05*
Preoperative Grade n.:			
0	0	0	
I	0	0	*p > 0.05*
II	25	19	*p > 0.05*
III	57	56	*p > 0.05*
IV	21	24	*p > 0.05*

Postoperative outcomes

Postoperative data analyses comparing postoperative POP-Q measurements and stage of prolapse between the TPFR and TVH groups are summarized in Table 3, respectively. TPFR patients were found to have a significantly higher curative rate than patients that underwent TVH. There were also significant differences for other POP-Q measurements and grades after the surgery at six and 12

Table 2. — Characteristics of the operation and complications compared between the two surgical groups.

	TPFR* (n=113)	TVH* (n=99)	*p*-value
Operative time (minutes)	52.3±15.3	115.3±11.3	*p < 0.000*
Anesthesia:			
Epidural anesthesia	17 (15%)	12 (12%)	*p > 0.05*
General anesthesia	96 (85%)	87 (88%)	*p > 0.05*
Blood loss (ml)	147.8±30.5	212.1±43.5	*p > 0.001*
Anus exhaust time(min)	26.2±4.7	39.3±9.8	*p > 0.05*
Remain catheter time(min)	80.3±12.7	120±18.1	*p > 0.05*
Mean hospital stay (days)	5.5±0.9	8.1±1.2	*p > 0.05*
Number of complications:			
Bleeding (>300ml)	0	6	
Bladder or rectum damage	2	6	*P>0.05*
Hematoma, ecchymosis	3	4	*P>0.05*
Urinary tract infection	5	10	*P>0.05*
Acute urine retention	10	12	*P>0.05*
Reoperation	3	2	*P>0.05*

months. However there were no significant differences between the surgical groups for POP-Q stage of prolapse at two months after surgery. Secondary outcome analyses also showed significant differences between the two groups in relation to the PFDI scores (Table 3).

Table 3. — Postoperative data analyses comparing postoperative POP-Q measurements and stage of prolapse between the TPFR and TVH groups.

	TPFR* (n=113)	TVH* (n=99)	*p*-value
Post-operative Grade n.:			
Month 2			
0	113	98	
I	0	1	*p > 0.05*
II	0	0	*p > 0.05*
III	0	0	*p > 0.05*
IV	0	0	*p > 0.05*
Month 6			
0	109	87	
I	4	9	*p > 0.05*
II	0	3	*p > 0.05*
III	0	0	*p > 0.05*
IV	0	0	*p > 0.05*
Month 12			
0	105	82	
I	6	13	*p > 0.05*
II	2	4	*p > 0.05*
III	0	0	*p > 0.05*
IV	0	0	*p > 0.05*
SUI[a]	79	64	
Month 2			
Cure	76	59	*p > 0.05*
Recurrence	3	5	*p > 0.05*
Month 6			
Cure	76	51	*p > 0.05*
Recurrence	3	13	*p > 0.05*
Month 12			
Cure	74	46	*p > 0.05*
Recurrence	5	18	*p > 0.05*
PFDI[b]			
Month 2	8.6±2.1	12.7±4.3	*p > 0.05*
Month 6	9.7±3.0	14.4±5.5	*p > 0.05*
Month 12	8.0±2.3	13.2±5.4	*p > 0.05*

[a] Stress urinary incontinence. [b] Pelvic floor distress inventory.

Discussion

Symptomatic pelvic organ prolapse has long been considered an indication for hysterectomy. Transvaginal hysterectomy has been the traditional surgical in treat of uterovaginal prolapse for many years. However, vaginal hysterectomy alone often fails to address the underlying deficiencies in pelvic support that cause uterovaginal prolapse. Indeed, Maher had reported that there were up to 40% of women undergoing hysterectomy subsequently present with vaginal vault prolapse [10]. An increasing number of women desire uterine preservation and alternatives to hysterectomy. As the main reasons for opting to preserve their uterus, women most often cite the feeling hat the uterus is an integral part of them, provides a sensation of wholeness, and serves a reproductive function, the uterus and cervix may have an important role in sexual function and wellbeing. Management of uterine prolapse in women who do no wish to undergo hysterectomy remains a challenge. In this report we compare the two surgical techniques. The advantages of this approach include better haemostasis, decreased hospital stay, reduced blood loss, less anus exhaust time, less more rapid recovery and smaller incisions.

Over the last 70 years, there were several surgical procedures for uterine preservation have been developed, including Manchester repair, sacral hysteropexy, sacrospinous hysteropexy and various laparoscopic uterine suspension techniques [11]. In 2008, Jia et al systematically reviewed that any type mesh significantly reduced objective prolapse recurrence rates compared with no mesh [12]. Fatton *et al.* reported the results of 110 women who underwent a new tension-free vaginal mesh repair of genital prolapse using polypropylene mesh. In that retrospective multicentric study, the authors reported one bladder injury, two hematomas, five mesh exposures and a failure rate of 4.7% with minimum follow-up of three months [13]. However, most of the published reports are small retrospective studies and the success rates reported vary widely. These studies show overall success rates of 77–97% [14–17], with slight variations when individual compartments are separately reported. From a surgical technique standpoint, it is becoming more evident that mesh implantation can be done safely if the surgical technique is standardized.

This study demonstrated that there were significant differences in operative variables and postoperative outcomes between TPFR and TVH groups. Follow-up beyond 12 months could therefore reveal more significant differences

between the two procedures for both PFDI score and apical stage of prolapse. The follow-up period here was only 12 months and that longer-term assessment is warranted. The findings of this study may have been limited by several factors. As this study involved the retrospective collection of data, the two surgical groups were heterogeneous and the comparative analyses may also have been limited by the sample size. Given the observed variability and number of patients in each group, the sample collected had sufficient power to detect difference in the outcome measure. Indeed, with regards to this comparison, some significant differences were found between the two surgical groups, but a limited sample size may have impacted the ability to demonstrate significant differences for other surgical outcomes. There may be several explanations for such a lower complications in the TPFR group. First of all, the dissection of the vaginal wall was performed not too thin. Second, positioning the mesh without tension, displacement, and overlap. In addition the total pelvic floor reconstruction is a technically challenging procedure that requires specific operative high skills and extensive experience form the surgeon.

Conclusion

The results of 12-month follow-up showed that the two surgeries are safe and effective surgical outcomes for treating female POP. The total pelvic floor reconstruction has more advantages in terms of safety, feasibility, and functional outcomes. The TPFR group showed less incidences of postoperative complications than the TVH group.

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