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CLINICAL ARTICLE

Transvaginal treatment of anterior or central urogenital prolapse using six tension-free straps and light mesh

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ABSTRACT

Objective: To evaluate the feasibility, efficacy, complications, and outcomes of treatment of anterior or central compartment urogenital prolapse by placement of an anteroposterior 22-g/m^2 mesh with six straps through one anterior vaginal incision. *Methods:* In a prospective study, patients treated for urogenital prolapse at a center in France between February 2008 and June 2011 were enrolled. Previous treatments, related interventions, intraoperative and postoperative complications, and anatomic outcomes were recorded during 3 years of follow-up. Failure was defined as recurrence of prolapse of stage II or higher according to the Pelvic Organ Prolapse Quantification system. *Results:* Overall, 74 patients were included. Preoperatively, 55 (74%) patients had stage III cystocele, 13 (18%) had stage IV cystocele, and 44 (59%) had associated uterine prolapse of at least stage II. Postoperative hematoma occurred in three patients and vaginal exposure in two patients. There were no cases of visceral injury. Vaginal comfort improved postoperatively: 68 (92%) patients were satisfied with the outcome and there were no cases of de novo dyspareunia. Seventeen (23%) patients subsequently had stress urinary incontinence that was treated by placement of suburethral tape. The anatomic outcomes were satisfactory for 72 (97%) women, including sexually active patients. *Conclusion:* Transvaginal prolapse repair by placement of an anteroposterior six-strap 22-g/m^2 mesh was feasible and effective with satisfactory 3-year outcomes.

1. Introduction

Treatment of urogenital prolapse is an important public health issue in high-income countries because of ageing populations. Olsen et al. [1] estimated that 11% of women aged 70–79 years undergo surgery for prolapse or stress urinary incontinence (SUI). Transvaginal surgery is gaining popularity, especially for older patients or patients who have undergone multiple previous operations. Several transvaginal repair techniques have been developed for the treatment of cystocele. Repair of cystocele by autologous fascia reinforcement results in a recurrence rate of 43%, as compared with 25% after treatment by placement of an absorbable implant [2].

The suspension of pelvic organs by fascial structures and ligaments has been described by Wei and De Lancey [3], and Petros [4]. The organs can be suspended in both the anteroposterior and lateral direction. The distance between the anterior and posterior transobturator straps does not exceed 45 mm, which means that only the anterior half of the base of the bladder is supported. The trans-sacrospinous strap is an apical support, and the anterior and posterior trans-obturator straps mimic the arcus tendineus of fasciae pelvis. This suggests that a mesh with both anteroposterior and lateral suspension might support the whole base of the bladder. The contraction force of the straps seems to be stronger than the sutures holding the mesh. As a result, it seems logical to place opposing straps to reduce the likelihood of migration and contraction of the mesh. These observations led to the design of a six-strap mesh with both anteroposterior and lateral suspension, where each strap is placed opposite another strap.

To our knowledge, no clinical study of an anteroposterior mesh with six transfixing pelvic straps has previously been reported. Therefore, the aim of the present study was to evaluate the feasibility and efficacy of this type of mesh for the treatment of urogenital prolapse, as well as intraoperative and postoperative complications and 3-year outcomes.

2. Materials and methods

The present prospective study included patients who underwent surgical treatment for urogenital prolapse with an OPUR prosthesis (Abiss, Saint Etienne, France) between February 1, 2008, and June 30, 2011, at Sainte Marie Private Hospital, Chalon sur Saone, France. Eligible patients had cystocele of stage II minimum, with or without hysterocele. Patients were excluded if they underwent any additional intervention during OPUR surgery other than perineoplasty (women with posterior prolapse were included if they did not undergo intervention for it during OPUR surgery). Women who underwent implantation of a sling

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for SUI during OPUR surgery were also excluded. The study protocol was approved by the Research and Ethics Committee of the Burgundy University Hospital. All patients were informed about the OPUR prosthesis and signed an informed consent form before surgery.

All patients had a preoperative assessment of their medical and surgical history, including any previous hysterectomy or prolapse treatment, and were asked whether they were sexually active. Preoperative urinary function symptoms were evaluated using the MHU (Mesure du Handicap Urinaire) questionnaire [5]. Vaginal comfort was defined as the absence of spontaneous vaginal pain or pain during clinical examination (insertion and movement of a vaginal speculum), absence of dyspareunia, and absence of palpable vaginal contraction (even if painless). Before surgery, gynecologic evaluation with a cervical sample and endometrial evaluation by ultrasonography were mandatory. Prolapse was classified according to the Pelvic Organ Prolapse Quantification (POP-Q) system. Cystocele and posterior colpocele were measured with the uterine prolapse or enterocele reduced to avoid overclassification of the cystocele and posterior colpocele.

All patients underwent treatment of an isolated cystocele or a cystocele with uterine prolapse by placement of an anteroposterior OPUR prosthesis by an experienced surgeon (E.D.) who used the same technique for each patient. Supplementary Material S1 shows the characteristics of the mesh and Fig. 1 shows the position of the mesh after placement. The stabilizing tapes were placed in three positions: apical trans-sacrospinous, anterior transobturator, and posterior transobturator. The apical trans-sacrospinous straps were placed by an in-out method [6]. This method was used instead of the out-in ischioanal route because the area of dissection is smaller and the route enables needle insertion through an anterior vaginal incision (sagittal, retrovesical, or transverse at the anterior vaginal fornix). The in-out pathway of the needle enables precise transfixion of the central of the sacrospinous ligament, thereby limiting risk of injury to the pudendal neurovascular structures and the sacral plexus. The transpelvic route is shorter because the needle exits above the level of the ischial tuberosity, about 8–10 cm under the ischiatic tuberosity, well away from the ischioanal area.

The anterior transobturator straps were placed by an out-in method, around the ischiopubic ramus and over the arch of the levator ani muscle. The posterior transobturator straps were placed by an out-in method in the sagittal plane parallel to the lateral surface of the iliac bone. The tunneler was introduced with the concave side turned toward the patient and the handle oriented upwards, 1 cm above the ischial angle of the obturator foramen. The strap was placed through the obturator internus and levator ani muscles, and entered the pelvic cavity at the level of the ischial spine, above the arch of the levator ani muscle.

Intraoperative and postoperative complications, and anatomic outcomes according to the POP-Q staging system were recorded during postoperative follow-up at 6 weeks, 6 months, and annually thereafter. Clinical examination was performed at each visit, including examination of the perineum, assessment for prolapse of any of the three compartments, vaginal exposure, functional urinary symptoms via the MHU questionnaire [5], and bowel disorders. Failed treatment was defined as recurrent prolapse of stage II or higher of the compartment treated. Ability to feel the upper prosthesis straps during deep vaginal examination without causing pain was considered normal.

Statistical analyses were performed with SAS version 9.2 (SAS Institute, Cary, NY, USA). Only patients with a follow-up of 3 years were included in analyses. A McNemar test or a Friedmann test was used to compare preoperative and postoperative variables overall and between age groups. All hypotheses were tested at the two-tailed 0.05 significance level.

3. Results

During the study period, 78 patients were enrolled in the study. Four patients were subsequently lost to follow-up, and the remaining 74 patients were included in the analyses. The mean age of the study women was 68 years. Among the 74 patients who presented with a cystocele, 68 (92%) were stage III–IV; 23 (31%) women had stage III–IV uterine prolapse, and 5 (7%) had a posterior colpocele of at least stage II (Table 1). Hysterectomy and placement of suburethral tape were not performed at the time of prolapse repair surgery. Perineoplasty was performed for 25 (34%) of patients, all of whom had a distance between the urinary meatus and the back wall of the vagina of 40 mm or more.

The intraoperative and postoperative complications are shown in Table 2. Three patients developed a pelvic hematoma, including one measuring 8 cm in diameter that was drained via the vagina. The other two hematomas occurred among patients who had undergone previous prolapse repair surgery and hysterectomy, and both drained spontaneously via the vaginal incision. Most patients complained of buttock pain immediately after surgery, which was clearly related to transfixion of the sacrospinous ligament. This pain resolved after 2–8 days.

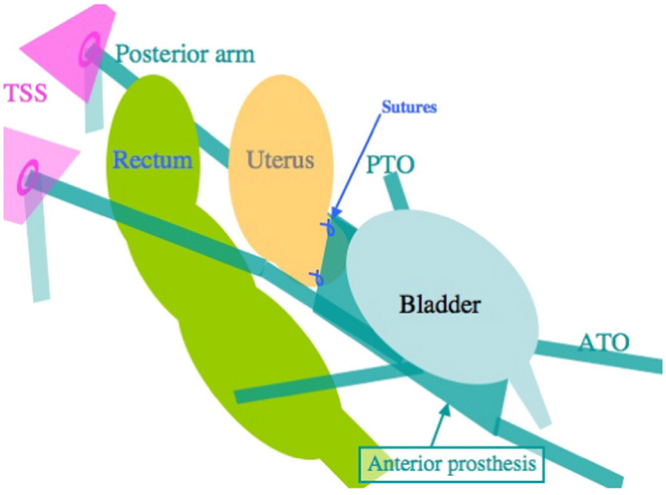

Fig. 1. Position of the prosthesis (an antero-posterior hammock with six straps). The prosthesis supports the whole base of bladder and reduces the possibility of migration and contraction of the mesh. Abbreviations: TSS, trans-sacrospinous; PTO, posterior transobturator; ATO, anterior transobturator.

Table 1
Characteristics and anatomic results (n = 74).[a]

Characteristic	Preoperative	Postoperative	*P* value
History of hysterectomy	14 (19)	–	–
History of prolapse correction	15 (20)	–	–
Sexual activity	30 (41)	–	–
Vaginal comfort[b]	57 (77)	68 (92)	<0.001
Prolapse POP-Q stage			
Cystocele			<0.001
≤ I	0	72 (97)	
II	6 (8)	2 (2)	
III	55 (74)	0	
IV	13 (18)	0	
Hysteroptosis			<0.001
≤ I	30 (41)	73 (99)	
II	21 (28)	0	
III	17 (23)	1 (1)	
IV	6 (8)	0	
Posterior colpocele			0.48
≤ I	69 (93)	70 (95)	
II	3 (4)	1 (1)	
III	1 (1)	3 (4)	
IV	1 (1)	0	

Abbreviation: POP-Q, Pelvic Organ Prolapse Quantification.
[a] Values are given number (percentage) unless indicated otherwise.
[b] Vaginal comfort was defined as absence of spontaneous vaginal pain or pain during clinical examination, absence of dyspareunia, and absence of palpable vaginal contraction (even if painless).

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