

Posterior IVS for vault suspension: A re-evaluation

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Abstract: A series of patients who underwent a posterior IVS (PIVS) procedure between 1998 and 2003 using either a nylon or multifilament polypropylene sling were reviewed in 2006. Analysis of the outcomes of these patients, in some cases up to seven years after surgery has led to a reassessment of this procedure. The PIVS is an effective posterior vaginal wall fascial support procedure (De Lancey Level 2) but is less effective as an apical support, and is completely ineffective in preventing cystocele.

Key words: Vault prolapse; Posterior intravaginal sling; Complications; Tape rejection; Recurrent prolapse.

INTRODUCTION

The PIVS was originally described by Petros as a vault suspension procedure. It was presented as an alternative to the sacrospinous fixation, transabdominal sacropexy and McCull culdoplasty.¹ As a day surgery procedure it had the potential to be used in a number of patients with medical conditions that made traditional surgery seem too risky to consider routinely. Within a short time of initial reports of this procedure focus shifted to the problems associated with the multifilament nature of the IVS tape (Tyco Healthcare, USA) and the impact of the novel surgical approach was diminished by this controversy.² Outcome data is presented of 127 patients who underwent follow-up after a PIVS using the original device.

MATERIALS AND METHODS

Patients who underwent a posterior IVS procedure for severe or recurrent vault prolapse between 1998 and 2003 were included in this study. All surgery was performed by the author and a detailed physical examination and clinical history was recorded. All patients had undergone a hysterectomy and had clinically evident vault prolapse (grades 2 or 3). Grade 2 vault prolapse was defined as prolapse extending to or almost to the introitus; grade 3 vault prolapse was defined as extending beyond the introitus. These assessments were made at the time of operation as the POPQ system was not available at that time. The surgical technique has been described in 2002 when outcomes of the first 93 patients were reported.³ In summary, a transverse upper full thickness vaginal skin incision was made 1.5 cm below the vaginal vault scar. Rectal examination was performed to identify the limits of the enterocele or rectocele. Bilateral perineal incisions were made 2 cm lateral and below the external anal sphincter at 4 and 8 o'clock. The IVS tunneler (Tyco Healthcare, USA) was placed into the ischioanal fossa for a distance of 4 cm before being turned inwards and upwards to reach the transverse vaginal incision. Rectal examination excluded any rectal injury and the procedure was repeated on the other side. The tape was secured to the vaginal vault and also to the remnants of the uterosacral ligaments using 00 Maxon sutures. The transverse vaginal skin incision was then closed with 00 Polysorb sutures. All patients were operated by the one surgeon. Coexisting fascial repairs were performed using a bridging technique originally described by Zacharin⁴ and subsequently modified by Petros¹ and Farnsworth.³

During the initial phase of this study Dr. Farnsworth was acting as a consultant and preceptor to Tyco Healthcare, USA. This study received no external funding. Conflicting interests: None.

Data were collected prospectively as part of an ongoing audit process and Quality Assurance program. In 2003 Ethics Committee approval was given to publish these data subject to assurances given with respect to preserving patient confidentiality.

RESULTS

One hundred and twenty seven patients underwent a posterior intravaginal sling between 1998 and 2003 using either a nylon tape or a multifilament polypropylene tape (Tyco Healthcare, USA). Patient characteristics are listed in Table 1.

Objective success of the PIVS procedure for recurrent vault prolapse was 66% at 5 years. All apical failures presented within 2 years of surgery but the incidence of cystocele increased with time. Twenty patients (17%) went on to have a suburethral sling procedure for stress incontinence. Ninety six patients (80%) reported a high satisfaction with the procedure.

DISCUSSION

The PIVS was first described as an apical attachment procedure.¹ It was minimally invasive and had a significant impact on irritative bladder symptoms as it restored posterior support to the bladder base.³ The original technique^{1,2} has been modified during the course of this study to improve safety and to try to minimise tape related complications. Rectal trauma occurred in only two patients, during the initial learning curve of the procedure. This risk was virtually eliminated by opening the pararectal space from the vault and placing a proximal digit on the upper surface of the levator muscle during needle insertion. The IVS needle could then be passed up from the ischioanal fossa under finger tip control while at the same time protecting the rectum by retracting it medially.

TABLE 1. – Patient Characteristics.

Patient age	Median 67 (Range 36-85)
Follow Up	Median 3.9 years (Range 2-7)
Lost to follow-up	6 patients
Previous Repair	127 patients
Previous hysterectomy	127 patients

TABLE 2. – Tape used in posterior IVS procedure.

Nylon Tape	49 patients
Multifilament polypropylene tape	78 patients

TABLE 3. – Outcomes.

Apical failure	14 patients	(11.67%)
Cystocele	27 patients	(22.5%)
Rectal trauma	2 patients	(1.6%)
Pudendal or inferior haemorrhoidal artery damage	0 patients	
Nerve injury	0 patients	
Ischiorectal abscess nylon tape	0 patients	
Mesh extrusion nylon tape at 2 years	5 patients	(10%)
Mesh extrusion nylon tape at 6 years	5 patients	(10%)
Ischiorectal abscess multifilament polypropylene tape	3 patients	
Mesh extrusion multifilament polypropylenetape at 2 years	2 patients	(3%)
Mesh extrusion multifilament polypropylene tape at 6 years	8 patients	(11%)
Clinical Infection of prosthesis	17 patients	(14%)
Clinical tape rejection	9 patients	(7.5%)
Post operative haematoma	5 patients	(4%)
Blood transfusion	0 patients	

Other technique refinements were developed to minimise the risk of tape related complications. These included observation of strict aseptic technique, meticulous haemostasis, covering antibiotics, skin incisions perpendicular to the direction of the tape, double layer closure of the fascia, ensuring that the tape is placed in position without any twist or folds and avoidance of any postoperative constipation, vomiting or activity that could dislodge the tape.

The PIVS is usually performed with a fascial repair. This could involve a traditional colporrhaphy, bridge repair, focal defect repair, biological prosthesis or mesh. A number of mesh prostheses based on the original posterior IVS are now available in the marketplace. Some surgeons have advocated passage of the posterior vaginal sling through the sacrospinous ligament in an effort to improve the degree of apical fixation. This technique has been incorporated into the Posterior Prolift device.⁵

As an isolated procedure the PIVS does not satisfy the criteria that David Nichols defined as the requirements of a successful vault prolapse repair.⁶ These are the need for an axial repair, the conservation of vaginal form and function and the requirement to repair coexistent cystocele, rectocele and enterocele. While the author now believes that the PIVS or “translevator sling” is unlikely to be adequate as an apical or level 1 procedure I do not believe that this failing is best solved by passing the sling through the sacrospinous ligament. Rather, the PIVS is a level 2 fascial attachment and can best be used to pull the posterior fornix downwards and posteriorly into the sacral concavity to restore the posterior vaginal fornix, and create extra vaginal length so as to reduce the risk of dyspareunia. A separate apical attachment using independent permanent non absorbable sutures can be placed on the posterior and medial end of the sacrospinous ligament on each side.

Increased vaginal length, restoration of the vaginal axis and recreation of the posterior fornix is achieved by placing a more medial and posterior apical attachment in combination with a PIVS. The effect of this approach is shown in Figures 1 and 2.

Problems with tape rejection and infection were evident from early in the history of the posterior intravaginal sling and led to the change from a nylon to a polypropylene tape in 1999 and subsequently the introduction of a monofila-

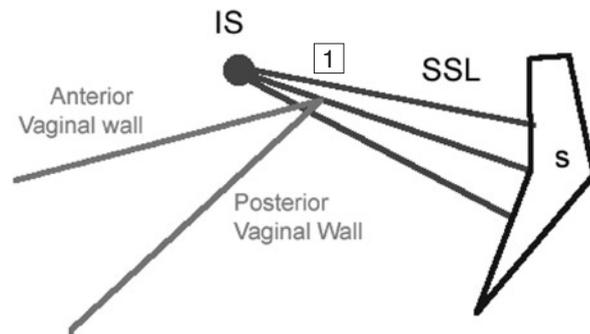


Fig. 1. – Standard sacrospinous attachment. IS = ischial spine, SSL = sacrospinous ligament, S = sacrum. The sacrospinous attachment (Position 1) is at the lateral end of the ligament.

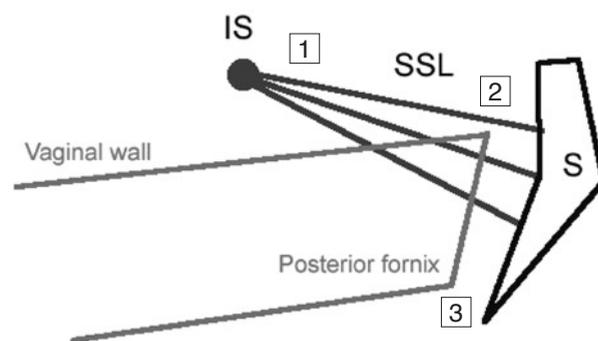


Fig. 2. – Medial sacrospinous attachment with posterior intravaginal sling restores vaginal axis and length. IS = ischial spine, SSL = sacrospinous ligament, S = sacrum. The apical attachment is independently secured at Position 2 which is much more medial and posterior than the standard sacrospinous attachment at Position 1. The PIVS at position 3 fixes the vaginal vault down and backwards into the sacral concavity.

ment tape in 2006. The availability of low density wide weave macroporous slings have made the new variations of the PIVS more popular than the original.

CONCLUSIONS

Early experiences with the PIVS procedure revealed that it was ineffective as a focal apical support using either the original nylon or multifilament polypropylene tapes. Surgeons have attempted to overcome this inadequacy by placing the sling through the sacrospinous ligament or by adding an additional independent Level 1 attachment. Using a posterior vaginal sling as an apical support by passing it through the lateral end of the sacrospinous ligament can cause loss of the vaginal axis and possible shortening of the vagina.

Cumulative rates of infection or rejection have led to the abandonment by most surgeons of the original multifilament polypropylene IVS tape. A number of new monofilament tapes are now available.

The Posterior IVS is an excellent Level 2 fascial attachment. It is effective in restoring vaginal axis, length and shape. It does not prevent cystocele and it is prone to failure leading to apical recurrence of prolapse, when used in isolation.

REFERENCES

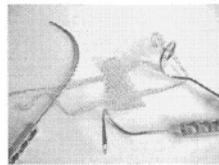
1. Papa Petros PE. Vault Prolapse II: Restoration of Dynamic Vaginal Supports by Infracoccygeal Sacropexy, an Axial Day-case Vaginal Procedure. *Int Urogynecol J* 2001; 12: 296-303.

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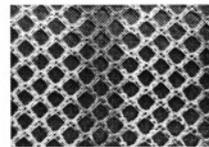
2. Baessler K, Hewson AD, Tunn R, Schuessler B, Maher CF. Severe mesh complications following intravaginal slingplasty. *Obstet Gynecol* 2005; 106: 713-6.
3. Farnsworth BN. Posterior Intravaginal Slingplasty (Infracoccygeal Sacropexy) for Severe Posthysterectomy Vaginal Vault Prolapse – A preliminary Report on Efficacy and Safety. *Int Urogynecol J* 2002; 13: 4-8.
4. Zacharin, Robert F. Free Full-Thickness Vaginal Epithelium Graft in Correction of recurrent Genital Prolapse. *Aust NZ J Obstet Gynaecol* 1992; 32: 146-148.
5. Fatton B, Amblard J, Debodinance P, Cosson M, Jacquetin B. Transvaginal repair of genital prolapse: preliminary results of a new tension free vaginal mesh (Prolift™) technique – a case series multicentric study. *Int Urogynecol J Pelv Floor Dysfunct* 2006; 28: (Epub).
6. Nichols DH, Randall CL. Massive eversion of the vagina 328-357. In: Nichols DH, Randall CL, eds, *Vaginal surgery*. 3rd edn Baltimore: Williams & Wilkins. 1989.

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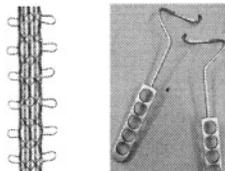
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