

Intravaginal posterior sling procedure (PIVS) for the treatment of uterine descensus and vaginal vault prolapse: retrospective analysis of efficacy, safety, complications and patient satisfaction in 150 cases

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Abstract: The safety, efficacy and patient satisfaction of the intra vaginal posterior sling procedure (PIVS) for correction of vaginal vault prolapse or descensus uteri was estimated in 3 Dutch hospitals. A population of 150 patients underwent a PIVS between January 2002 and April 2005 was evaluated retrospectively. Between 4 and 18 months after the operation an inquiry was sent to all to evaluate the results after this middle-long follow-up period. In 87% (131/150) PIVS was combined with other surgical techniques as vaginal hysterectomy, anterior and/or posterior vaginal wall repair. No complications occurred during surgery. Complications post operatively were: cystitis 13, fever 1, hematoma 8. After 8 weeks there was no improvement of prolapse complaints in 16 patients (11%). In 19 (13%) a secondary prolapse was found, mainly cystocele (14 patients). Of the 100 patients with micturition or urinary incontinence problems before the operation, 70 experienced improvement of their presenting complaints. De novo urgency was found in 12 patients (8%). Tape erosion occurred in 4 patients (2.6%) during the follow-up period. Response rate of the questionnaire was 65%. The mean score for patient satisfaction was 4.8 (range 0-5) and the mean score for efficacy 4.6 (range 0-5). PIVS is a safe and effective treatment for vaginal vault prolapse or descensus uteri, with a high score for patient satisfaction during a medium follow-up.

Key words: Vaginal vault prolapse; Posterior intravaginal sling.

INTRODUCTION

The posterior intravaginal sling procedure (PIVS) is a surgical technique for the treatment of vaginal wall prolapse or descensus uteri. It was described by Petros in 1997 and is considered to be less invasive when compared to classical surgical procedures.¹ Through two small perianal incisions a tunneler (Tyco IVS Tunneler™ Device) is guided to the ischial spine on both sides, where the sacrospinous ligament is perforated just medial to the spine to reach the paravaginal space. A polypropylene tape (8 mm wide multifilament polypropylene tape Tyco Healthcare, the Netherlands) is pulled through the tunneler. After removal of the tunneler the tape is fixed to the vaginal vault or the posterior side of the cervix. Pulling the tape will now lift the vaginal vault or cervix and create suspension as an artificial neoligament.

The goal of the present retrospective study is to evaluate efficacy and safety of PIVS for the treatment of vaginal wall prolapse or descensus uteri, as well as patient satisfaction.

MATERIAL AND METHODS

Three Dutch hospitals participated in the study: Catharina Hospital Eindhoven, Laurentius Hospital Roermond and Maasland Hospital Sittard. All patients who underwent a PIVS procedure between January 2002 and April 2005 were studied retrospectively. The following data were collected:

a. History: gynaecological operations, pessary use, pelvic floor physiotherapy, estrogen use, parity, mode of delivery, birthweight of the children, chronic obstructive pulmonary disease.

b. Complaints: prolapse, voiding dysfunction, urinary stress-urge incontinence, defecation disorders, dyspareunia.

c. Physical examination: age, weight, height. During vaginal examination the position of the cervix or vaginal vault and the presence of cystocele, rectocele and enterocele was graded according to the Baden-Walker halfway classification system for grading prolapse, with patients straining maximally in the dorsal lithotomy position:²

- Grade 0: normal position for each respective site
- Grade I: descent halfway to the hymen.
- Grade II: descent to the hymen
- Grade III: descent halfway past the hymen
- Grade IV: maximum possible descent for each respective site.

d. Surgical procedure: duration, blood loss, combination with other surgical techniques (colporrhaphy anterior or posterior, hysterectomy, tension free transvaginal tape for urinary stress incontinence (TVT), use of vaginal pack, urinary catheter, complications.

e. Hospital stay: length, time of catheter removal, wound infection, fever (> 38 °C), cystitis, and hematoma.

f. Outpatient visit after 6 weeks: effect on pre-existing complaints, new complaints, vaginal assessment according to the Baden-Walker classification, signs of tape erosion.

Subsequently a questionnaire was sent to all involved patients 4-18 months after surgery. In this way the effect on pre-existing complaints was evaluated and the appearance of new complaints, specifically on sensation of prolapse, micturition, incontinence, stool and intercourse. They were asked to judge efficacy and satisfaction from their point of view by scoring both with a figure of 0-5, in which 0 stands for no or a negative effect and 5 for an excellent effect. Those who did not respond were contacted by phone and invited to participate. For evaluation all data were stored in the database program Microsoft Access.

RESULTS

A total of 150 patients were included. (Eindhoven 87, Roermond 44, Sittard 19). Median age was 62 years (range 35-86), median BMI 26 kg/m² (range 21-34), and median parity 2 (range 0-8). They all had vaginal deliveries except one who had a cesarean section. Birth weights were >3500 grams in 110 cases (55%). Twelve had a history of chronic obstructive pulmonary disease (8%).

Pre-existing complaints were: prolapse 125 (85%), urinary incontinence 79 (urge 43, stress 21, mixed 15, together

TABLE 1. – Pre-operative assessment of cervical or vaginal vault prolapse, and combinations with anterior and posterior vaginal wall prolapse.

<i>descensus cervix/ vaginal apex</i>	<i>cystocele</i>	<i>rectocele enterocele</i>	<i>cystocele recto/enterocele</i>	<i>no significant cysto/rectocele</i>	<i>total</i>
C grade 1	0	1	2	0	3
E grade 2	10	19	11	0	40
V grade 3	2	1	3	0	6
I grade 4	2	0	0	15	17
vault prolapse grade 3 or 4	39	33	8	4	84

representing 53%), constipation 39 (26%) of whom 5 initiated or assisted defecation with vaginal digitation and dyspareunia 26 (17%).

Before operation 48 used a pessary, 21 had pelvic floor physiotherapy and 51 used vaginal estrogens. Eighty four patients (56%) had a past history of hysterectomy (57 vaginal, 27 abdominal).

The pre-operative findings in physical examination are summarized in table 1. Of the 66 women who still had their uterus, 17 had cervical prolapse below the level of the hymen (26%). Fifteen patients had no significant anterior or posterior vaginal wall prolapse. All 84 women without uterus had a vaginal vault prolapse grade 3 or 4. Only four patients in this group (5%) appeared to have no significant prolapse of the anterior or posterior wall.

The types of operation performed in the study population are summarized in table 2. In 19 patients PIVS was not combined with other surgical procedures. In the majority PIVS was combined with anterior and/or posterior repair, or vaginal hysterectomy.

In the case of an isolated PIVS procedure, operation time was less than 45 minutes. No complications occurred during surgery. At the end of the operation a urinary catheter was placed in all cases and a vaginal pack in 144 cases. Vaginal pack and urinary catheter were removed the following morning. Median hospital stay was 3 days (range 1-12).

Postoperative complications were: fever 1, cystitis 13, and hematoma 8 (two required surgical intervention).

Six weeks after operation the effect of the procedure on

TABLE 2. – Operations performed in the study group in combination with PIVS.

PIVS alone	19
with colporrhaphy anterior	21
with colporrhaphy posterior	59
with colporrhaphy anterior and posterior	36
with vaginal hysterectomy	14
with IVS anterior	1
Total	150

PIVS = posterior intravaginal sling.

TABLE 3. – Influence of surgical treatment on pelvic floor disorders.

<i>Influence of prolapse surgery</i>	<i>Pre Op.</i>	<i>Post Op.</i>			
		<i>Complete cure</i>	<i>Improved</i>	<i>Unchanged</i>	<i>Worse</i>
Prolapse sensation	83	0	77	3	3
Micturition problems/incontinence	57	26	5	7	19
Defaecation problems	35	22	6	13	0
Dyspareunia	24	22	6	6	6

the presenting symptoms was evaluated. The majority of women experienced disappearance or significant improvement of their pre-existing complaints: prolapse sensation (n = 109/125, 87%), micturition or incontinence problems (n = 70/100, 70%). De novo urgency occurred in 12 cases. Nine patients improved with conservative therapy. Three underwent a subsequent anterior repair.

During the follow-up period of 4 months up to 18 months 19 women developed a prolapse recurrence (13%) of which 13 were of the anterior wall, 2 of the posterior wall, 3 of the vaginal vault and one a combined prolapse. Thirteen needed additional surgical treatment. In one of them no adequate suspension was obtained and the operation was deemed a failure.

Tape erosion was found in 4 women (3%). In 2 cases the tape had to be removed due to local infection. In the other 2 cases cutting of the exposed tape was sufficient to heal the affected area.

The response to the questionnaire was 65% (98/150). The effect on pre-existing complaints is summarized in table 3. A satisfactory effect on prolapse symptoms was found in 93% of patients (77/83). For micturition problems or urinary incontinence it was 54% (31/57), although 7 patients (12%) experienced increase of complaints after surgical treatment. The same pattern was found for dyspareunia. Defecation problems were significant less postoperatively in 63% (22/35) and unchanged in 37%.

Six weeks after the operation 12 women reported de novo urgency. Five of these 12 participated in the questionnaire study and all of them still had urgency complaints to some degree. Five women who had no urgency problems six weeks after operation have developed this complaint subsequently.

All participating women (98) were asked to score satisfaction and effectiveness of the surgical procedure from 0 to 5. The mean score for satisfaction was 4.8 and for efficacy 4.6.

DISCUSSION

With PIVS a new surgical technique has been introduced for the treatment of uterine prolapse and vaginal vault prolapse. It is important to determine the safety and effectiveness of such a procedure.

TABLE 4. – Complications of surgical treatment of prolapse using PIVS.

Literature	Cases	Surgical complications	Fever	Hematoma	Cystitis	Tape erosion
Biertho et al. ⁵	34	0	–	0	–	1
Everhardt et al. ⁶	32	0	–	–	–	8
Farnsworth ³	93	2	0	0	5	1
Haest et al.	150	0	1	8	13	4
Meschia et al. ⁴	33	0	–	–	–	1
Petros ¹	75	2	0	0	–	4

In our study there were no operative complications. In table 4 complications are described in the literature of 417 cases of PIVS by 6 authors. The most significant complication was rectal perforation in 4 cases (1%).^{1,3-6}

In our study population, 8 patients developed hematoma of the vaginal wall after operation. Two of them were treated surgically.

Postoperative cystitis was found in 8.6% in our study and in 5.4% in the study of Farnsworth.³ Wagner et al studied the incidence of cystitis after abdominal and vaginal hysterectomy combined with anterior or posterior colporrhaphy.⁷ The reported incidence of cystitis as proven by culture was 45%.

We found tape erosion in 4 patients (3%) after a follow-up of 4-18 months. In the literature the reported incidence is 1% (Farnsworth) to 25% (Everhardt).^{3,6} Biertho described a tape erosion as early as 2 weeks after operation.⁵ Learning curves (tape placed too superficially), variable follow up periods (2 months to 4.5 years) and variable degrees of vaginal wall atrophy, will have contributed to the differences in incidence of tape erosion. Long term results are still unknown.

The incidence of prolapse recurrence after classical prolapse surgery is high. One year after operation Whiteside et al. found, in 389 patients, 58% recurrences grade 2 and 10% recurrences grade 3.⁸ In our population prolapse recurrence was found in 13%. Petros always combined PIVS with bridge repair of the posterior vaginal wall. In his series (75 patients) he noted recurrence at 1 year of posterior wall prolapse 2% and anterior wall prolapse 8%. Review at 4.5 years showed a failure of 5.2% and 16% respectively.¹ Meschia published a randomized trial in 66 women. He compared two groups of 33 women, each with vaginal vault prolapse of grade 3 or more. One group was treated with sacrospinous fixation of the vaginal vault. The other group had PIVS. Median follow-up was 18 months. Prolapse recurrence was found in 12% of the sacrospinous fixation group and in 12% of the PIVS group (not significant).⁴ We conclude that recurrent prolapse seems to be less when classical prolapse surgery is combined with PIVS.

Our study showed symptom improvement as follows: prolapse sensation in 93%, micturition problems or urinary incontinuity in 54%, defecation difficulties in 63% and dyspareunia in 50%. These results are in concordance with literature.

Petros defined cure as a reduction of 50% or more in complaints.¹ According to this definition he found a cure rate for prolapse complaints of 91% for PIVS treatment. Farnsworth used the same definition and found a cure rate of 91% for prolapse sensation, 79% for urgency, 82% for nocturia and 78% for pain, using PIVS.³

We found de novo urgency in 12 patients (8%), of whom 5 still had complaints at the end of the follow-up period. This complication is not evident in other studies of PIVS. In classical prolapse surgery it is a well recognized complication.

Borstad et al. reported de novo stress incontinence in 22% (16/73) after vaginal repair.⁹ In our study we did not identify any cases of de novo stress incontinence after surgery.

Six women (4%) reported dyspareunia, which was not present preoperatively. In all these cases the intravaginal sling procedure was combined with classical vaginal repair of one or more compartments. Other studies on PIVS do not report data on dyspareunia.

Patient satisfaction according to the questionnaire results was very high: the effect of the procedure on pre-existing complaints was rewarded with 4.8 points out of 5 for satisfaction and 4.6 out of 5 for efficacy.

This retrospective study shows that PIVS is a safe and effective treatment modality for uterine and vaginal wall prolapse. Follow-up is needed to assess long term safety.

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