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Original Article

Obstetrics and Gynaecology Section

Comparison of the Efficiency of Posterior Intravaginal Sling (PIVS) Procedure in Older and Younger Groups

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ABSTRACT

Introduction: Vaginal vault prolapsus is a challenging problem for the patients and physicians. There may be differences between young and elderly patients in terms of efficiency and safety of surgical procedures.

Aim: The aim of our study was to compare the efficiency of the Posterior Intravaginal Sling (PIVS) procedure in older versus younger patient groups.

Materials and Methods: A total of 40 patients who underwent the PIVS procedure were chosen. Twenty of these patients were younger than 60 years of age (Group I) while the other 20 patients were 60 years of age or older (Group II). Preoperative Pelvic Organ Prolapsed Quantification (POP-Q) reference points were compared with postoperative data at the first year following surgery. Student's *t*-test was used to analyse continuous variables and the χ^2 test was used to analyse categorical data. The Mann–Whitney test was used for data that were not normally distributed.

Results: Anatomical cure rates were 90 percent in both groups (p=1.00). There were significantly greater improvements in POP-Q points in group I than group II.

Conclusion: It could be concluded that PIVS as minimally invasive procedure for vaginal vault prolapsed and is effective in all age groups.

Keywords: Pelvic organ prolapsus, Risk factor for recurrence prolapsus, Vaginal vault prolapsus

INTRODUCTION

Vaginal vault prolapse is defined as the relocation of the vaginal vault under its anatomic position after a hysterectomy. The incidence of post-hysterectomy vaginal vault prolapse was 0.5% [1]. Vaginal hysterectomy increases the risk of prolapse fivefold, and if the indication for hysterectomy is uterine prolapse, the risk is even greater. After Petros and Ulmstein described the integral theory in 1990, the integrity of pelvis and the function of the uterus and cervix in normal pelvic physiology were clearly understood. This theory describes the relationship between pelvic bones, organs, muscles, and connective tissue. According to this theory, the uterus and cervix are keystones of the pelvis, and losing these structures not only influences vaginal apical support, but also changes the entire pelvic balance [2].

The major risk factors for vault prolapse include age, vaginal and abdominal hysterectomy, pregnancy and vaginal delivery, obesity, genetic predisposition, connective tissue disease, and menopause [3-9]. The influence of age on connective tissue is related to the loss of elastin and collagen. Additionally, age also influences the stage of prolapse [6,10]. The effect of age on the Pelvic organ prolapse (POP) recurrence is inconsistent. The loss of specific collagen on the pelvic floor may have influences on POP recurrence rates. Age was described as a risk factor by Vergelth et al. in recently published study [11].

The Posterior Intravaginal Slingplasty (PIVS) was first described by Peter Petros as a minimally invasive surgical procedure for the treatment of the vaginal vault prolapsed [12]. According to this surgical technique, vaginal vault prolapsus could be corrected with a small piece of mesh material.

AIM

The present study was conducted with the aim to compare the efficiency of PIVS procedure in older versus younger groups.

MATERIALS AND METHODS

This prospective study includes 40 patients who underwent the PIVS operation for vaginal vault prolapse in urogynecology department of Etlik Zubeyde Hanim Maternity Hospital between 2007-2009. Twenty patients were younger than 60 years of age (Group I), and 20 patients were 60 years of age or older (Group II). The study was approved by the Research Ethics Committee of the Etlik Zubeyde Hanim Maternity Hospital. Patients with recurrent pelvic organ prolapsed and who refused surgery, were excluded from study. Preoperative medical history, age, body mass index were recorded and complete blood count and liver function tests were performed. Systemic co-morbidities (Hypertension, pulmonary disease, diabetes) of patient were noted and were compared. All patients underwent a gynecologic pelvic examination and the POP-Q classification system was used for staging. Some accompanying symptoms like Stress Urinary Incontinence (SUI), Nocturia (NU), Urgency (URG), Abnormal Emptying (AE), Fecal Incontinence (FI), and Pelvic Pain (PP) were also recorded.

All operations were performed by the same surgical team under spinal anaesthesia. We performed the surgical technique that was originally described by Petros [12].

STATISTICAL ANALYSIS

The Statistical Package for Social Sciences (SPSS Inc, Chicago, Illinois, USA) was used for statistical analysis. Preoperative POP-Q reference points were compared with the postoperative first year's data. The data were summarised as means ± standard deviations or percentages, as appropriate. Student's *t*-test was used to analyse continuous variables and the χ^2 test was used to analyse categorical data. The Mann–Whitney test was used for data that were not normally distributed. A $p<0.05$ was considered statistically significant.

RESULTS

Our study included 40 patients whose ages ranged from 38 to 71 years. The mean age of group I and group II were 50.05±5.5 (38-59) and 65.4±3.5 (60-71) years, respectively. There were no statistically significant differences between BMI, systemic co morbidities and parities in the two groups [Table/Fig-1]. None of the patients had previous cesarean sections, or any other pelvic surgery.

	Group I (*n*: 20)	Group II (*n*: 20)	p
Follow-up	12	12	
Mean age	50.05 ± 5.5	65.4 ± 3.5	
Parity	3.55 ± 1.7	3. 05 ± 1.05	p> 0.05
Body Mass Index	34.85 ±4.7	35.55 ± 3.97	p> 0.05

[Table/Fig-1]: Group characteristics.

The preoperative POP-Q reference points were compared with the postoperative first year's data, and the reference points are shown in [Table/Fig-2]. C points of -5 or above were accepted as anatomical cure. The anatomical cure rates in each group were 90 % (p=1.00). The patients who failed were 50 and 57 years of age in group I, and 64 and 69 years of age in group II. Although there was no difference between anatomical cure rates, the improvement in POP-Q points in group I was significantly better than in group II [Table/Fig-2]. Symptomatic changes are shown in [Table/Fig-3]. During the follow-up period, mesh erosion occurred in 1 patient (5% for each group) in each group.

POPQ point			Preoperative		Postoperative	
	Group	N	Mean ± SD	p	Mean ± SD	p
C	1	20	8,05±0.75	0.001	- 7. 48± 4. 92	0. 003
	2	20	7.05±0.75		- 6. 65± 4. 22	
TVL	1	20	8,05±0.75	0.001	9. 05± 0. 75	0. 000
	2	20	7.05±0.75		7. 95± 0. 75	
Pb	1	20	1,60±0.71	0.461	2. 88± 0. 62	0. 478
	2	20	1.40±0.50		2. 80± 0. 37	
Gh	1	20	3,60±0.59	0.698	2. 55± 0. 60	0. 904
	2	20	3.50±0.51		2. 50± 0. 51	
Bp	1	20	4,65±0.74	0.000	- 4. 90± 2. 78	0. 001
	2	20	3.70±0.73		- 3. 80± 2. 58	
Ap	1	20	3,45±0. 88	0.001	- 3. 05± 1. 84	0. 000
	2	20	2.55±0.682		- 1. 95± 1. 63	
Ba	1	20	4,70±0. 73	0.000	- 4. 85± 2. 92	0. 001
	2	20	3.70±0.73		- 3. 80± 2. 58	
Aa	1	20	3,45±0. 88	0.000	- 3. 00± 1. 97	0. 000
	2	20	2.50±0.51		- 2. 00± 1. 48	

[Table/Fig-2]: Preoperative and postoperative pelvic organ prolapse quantification scores

Symptoms	Group I				Group II			
	Preoperative		Postop. 1. year		Preoperative		Postop. 1. year	
	n	%	n	%	n	%	n	%
NU	4	20	1	5	5	25	2	10
SUI	0	0	0	0	0	0	2	10
URG	3	15	2	10	3	15	1	5
AE	2	10	2	10	3	15	2	10
FI	3	15	1	5	2	10	1	5
PP	5	25	2	10	4	20	1	5

[Table/Fig-3]: Symptomatic changes of two groups.
NU: Nocturia, SUI: Stress Urinary Incontinence, URG: Urgency, AE: Abnormal Emptying, FI: Fecal Incontinence, PP: Pelvic Pain

DISCUSSION

Vaginal vault prolapse will become a frequent health problem in the future as a result of previous hysterectomy, growing geriatric population and increasing expectations for a better quality of life. Many techniques have been previously described for treating prolapse and the symptoms accompanying this disorder [13,14].

Age is one of the causes of POP, and increases the stage of prolapsed [6,10]. Age also affects the success of treatment [15]. In a study, Whiteside et al., concluded that age less than 60 years is an important prognostic factor for surgery [16]. Kim et al., showed a linear correlation between age and the stage of prolapsed [8]. In older patients, a longer duration of menopause and a longer hypo-estrogenic period can predispose to prolapse. In our study group, all POPQ points in older patients suggest severe prolapsed than younger patients. These findings are correlated with literature. According to our data we can conclude that age has adverse effect on pelvic organ prolapsed. Another explanation of this result is that the only severe pelvic organ prolapse could induce older patients to apply physician.

Dietz et al. published a study in 2008 which included 1110 patients. In this study, the median age was 53.9 (17-90) years [17]. He observed that patients were diagnosed anatomical POP between 45-65 years of age, and the addition of menopausal symptoms leads to a higher rate of symptoms as age increases. He concluded that there was a weak relationship between age and POP. In our study, we arrive at the same conclusion based on the period of symptoms. Group II has a statistically significantly longer symptomatic period.

Jeon reported that age has a minimal effect on the recurrence of POP and that the most important factor for recurrence is the preoperative stage of prolapsed [18]. Salvatore et al., published a study and they support these findings and conclude that only the prolapsed stage equal or over grade III had significantly higher risk for prolapsed [19]. According to our results age is not a risk factor for prolapse recurrence. Even group II had more severe prolapsed than group I, all patients had equal or over grade III pelvic organ prolapse.

When we compare the POPQ reference points the difference was not significant in perineal body (pb) and genital hiatus (gh) points at preoperative and postoperative period. Perineal body was defined as the distance from the posterior aspect of the gh was defined as the distance from the middle of the urethral meatus to the posterior hymenal ring to the midanal opening [20]. These two points are the structural element of woman perineum. Tsai et al., suggested that pb did not have association with race [21]. We can conclude that pb and gh does not have association with age. And another conclusion from study is PIVS does not have effect on the restoration of pb or gh. The other reference points have significantly difference between two groups. Group I has better preoperative and postoperative values then group II. However, postoperative values of group II could be accept as cure of POP.

Most patients live with prolapse for years without any issues, and often seek medical attention after menopausal symptoms occur. This may be a cause of seeing an advanced stage of prolapse in older patients. In our study, there was a more advanced stage of prolapse in older patients according to the POP-Q reference points, but after a year of follow-up, there was no difference in success rates.

Many studies have shown symptomatic improvement with PIVS [22,23]. In our study, we observed symptomatic improvement in both groups. As we did not have a sufficient number of symptomatic patients, we could not make conclusions about symptomatic improvements after PIVS. In our follow-up, we had some improvements in nocturia, urgency, abnormal emptying, fecal incontinence, and symptoms of pelvic pain, but 2 patients in

group II had de novo stress urinary incontinence; one of them also had a recurrent vault prolapse.

In 2006, Mattox performed PIVS in 21 patients whose mean age was 70 years [24]. He preferred the PIVS in patients with pulmonary, cardiac, thyroid, and hypertensive disease as well as poor performance status because it is less invasive than other techniques. He used the POP-Q classification system for staging, and had a 26% point C failure, and a 37% point Aa, Ap failures. He concluded that PIVS has poor results in elderly patients. However, operative failure can be a result of systemic disease and poor performance status. Additionally, pulmonary disease, cardiac disease, and hypertension are important risk factors for POP. In our study two groups were similar for systemic co morbidities, parity and BMI.

The incidence of mesh erosion varies from 0% to 13% after the PIVS procedure according to the literature [25,26]. Balsak et al., found that the mesh erosion rate of PIVS was 14.2% and 33.3% of patients has disparunia after operation [23]. In our study, the incidence of mesh erosion was 5%, and was diagnosed in the 6th week. The visible mesh was removed under local anaesthesia. Local estrogen cream and antibiotic were used for ten days. There was no recurrence. Avoiding mesh contamination and surgical site contamination may be useful in preventing mesh erosion.

LIMITATION

Our study is limited by the small number of cases when evaluating the effect of surgery on symptoms. Because symptoms are a major problem in patients, symptomatic improvement must be evaluated by a larger case series.

CONCLUSION

In this study, it could be concluded that PIVS as minimally invasive procedure for vaginal vault prolapse is effective in all age groups. For the treatment decision, age should not be accepted as a poor prognostic factor for PIVS procedure. In order to understand the effect of this procedure on symptoms, studies with a larger sample size are needed.

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