

Role of Preoperative and Postoperative Pelvic Floor Distress Inventory-20 in Evaluation of Posthysterectomy Vault Prolapse

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ABSTRACT

Background: Posthysterectomy vault prolapse is a common problem after vaginal or abdominal hysterectomy. The objective was to assess the role of Pelvic Floor Distress Inventory 20 (PFDI-20) in evaluation of vault prolapse. **Materials and Methods:** Prospective study in 20 women with posthysterectomy vault prolapse of Stage 2 and above. The outcome measure was to calculate PFDI-20 score in all cases before surgical intervention and to recalculate it again in 6 months after different surgical procedures for vault prolapse and to statistically compare the PFDI-20 score in different types of surgery over 4 years period at a tertiary referral hospital for surgical treatment. Prolapse was classified using Pelvic Organ Prolapse Quantification and intraoperative findings. All women were operated for vault prolapse as per hospital protocol and stage of prolapse by either vaginal sacrospinous fixation or abdominal sacrocolpopexy. **Results:** Mean age, parity, and body mass index were 54.8 years, 3.5, and 22.71 kg/m² respectively. Preceding surgery was vaginal hysterectomy in 75% women and abdominal hysterectomy in 25% women. Complaints were bulge or mass feeling at perineum (100%), pressure in lower abdomen and perineum (55%), and constipation (60%). The type of prolapse was vault prolapse (100%), cystocele (100%), rectocele (100%), and enterocele (45%). The range of PFDI-20 was 88–152 with mean being 123.50 ± 22.71 before surgery while its range decreased significantly to 80–126 with mean being 106.40 ± 16.45 after surgery ($P < 0.01$). Mean postoperative PFDI-20 score was 107.40 in vaginal sacrospinous fixation group and was 105.30 in abdominal sacrocolpopexy group and was not statistically different ($P = 0.18$). **Conclusion:** PFDI-20 score can be used to see the adverse impact of vault prolapse on pelvic floor and to assess the beneficial effect of different types of surgeries on the score.

KEYWORDS: Cystocele, enterocele, Pelvic Floor Distress Inventory-20, rectocele, vault prolapse

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INTRODUCTION

Pelvic floor disorders (PFDs) are common disorders, especially in menopausal women and include conditions such as pelvic organ prolapse (POP), urinary incontinence, and fecal incontinence.^[1] POP further includes anterior compartment defects (cystocele and urethrocele), middle compartment defects (uterine prolapse, vault prolapse), and posterior compartment defects (enterocele, rectocele, and deficient perineum).^[1,2] Although not life-threatening, PFDs have a significant

negative impact on the quality of life.^[1,2] The incidence of PFDs varies in different countries, but about 50% parous women have some prolapse although only 10%–20% seek help.^[1,2] The incidence of POP in the Dutch community study was up to 75% in 45–85 years

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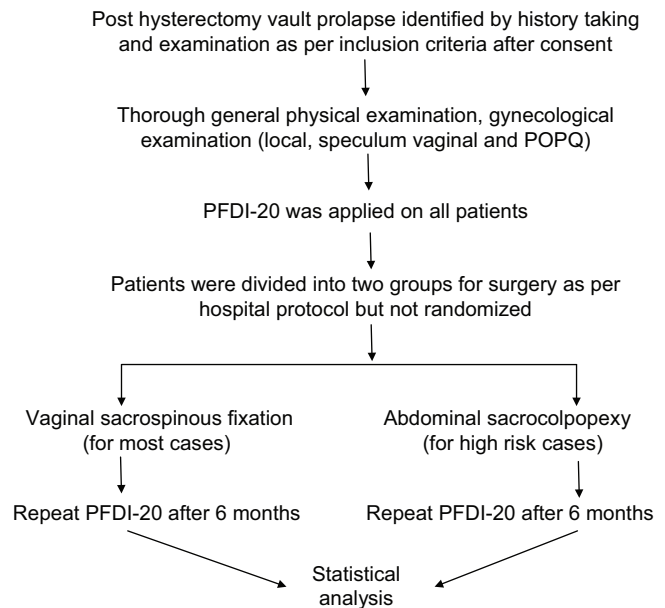
women, whereas it was 28.7% POP, 19.7% urinary incontinence, and 6.9% fecal incontinence in sub-Saharan countries.^[3,4] Posthysterectomy vault prolapse has been reported to follow 11.6% of hysterectomies performed for prolapse and 1.8% for other benign conditions.^[5] A large study from Austria estimated the frequency of posthysterectomy vault prolapse requiring surgical repair to be between 6% and 8%.^[6] Vaginal vault prolapse has been defined by the International Continence Society as descent of vaginal cuff below a point which is 2 cm less than total vaginal length above the plane of hymen.^[7] POP and vault prolapse can cause pelvic pressure and heaviness, pelvic pain, urinary or fecal incontinence.^[8] It can also affect daily activities, sexual function, and quality of life.^[9]

Diagnosis of POP, including vault prolapse, is made from history taking and clinical examination.^[1,2] Staging of prolapse can be done using Baden Walker Halfway grading system to describe prolapse using 0–4 scale in relation to hymen, but it is not very accurate.^[10] POP Quantification (POPQ) system was first introduced from the USA by Bump *et al.*^[10] It is an objective, site specific system for describing, quantifying, and staging POP using six defined points in the vagina measured during maximum straining in relation to hymen.^[11,12] It provides standardized tool to record, communicate, and compare results of different centers for POP including vault prolapse and has been accepted by most urogynecological societies of the world due to its proven interobserver and intraobserver reliability.^[10-12]

The Pelvic Floor Distress Inventory-20 (PFDI-20) and Pelvic Floor Impact Questionnaire are validated in women with PFDs and are widely used to provide an accurate measure of symptoms and bothersome in relation to prolapse and urinary and colorectal and anal symptoms.^[2,13,14] The PFDI-20 consists of 20 condition specific questions examining pelvic symptoms on a 4-point scale for women with PFDs and has good to excellent test retest reliability. It has been validated in many languages worldwide.^[13,14] In the present study, we performed PFDI-20 on 20 women with vault prolapse, and POPQ on all the patients and compared the results and repeated PFDI-20 again 6 months after surgery.

MATERIALS AND METHODS

It was a prospective study conducted over 20 patients of vault prolapse following abdominal or vaginal hysterectomy admitted in a tertiary referral hospital for surgery for vault prolapse over 4 year period. The inclusion criteria included symptomatic women with posthysterectomy vault prolapse irrespective of indication and type of previous hysterectomy between



Flow Chart 1: Selection of cases for surgery and follow up

25 and 85 years of age who were willing to participate in the study. The study was approved by the Institutional Ethical Committee. Informed written consent was taken from all patients. The women with utero-vaginal prolapse, nulliparous prolapse, and who were not willing to participate were excluded from the study. Detailed history was taken from all patients regarding symptoms of prolapse, any urinary complaints (stress urinary incontinence [SUI] or urge incontinence), any bowel problems, fecal incontinence, detailed obstetric history (mode of delivery, birth weight, whether episiotomy was given or not, perineal tear, any obstructed or difficult labor), any chronic cough, constipation or smoking. All women underwent general physical examination, measurement of body mass index, heart, chest, neurological, abdominal and gynecological examination including local examination, speculum examination and vaginal examination to look for prolapse, its grading as per POPQ as described by Madhu *et al.*^[11] The patients were put in the dorsal position with full bladder and local systematic examination of genitalia was made for any cystocele, urethrocele, vault prolapse or enterocele, rectocele and definite perineum, and rectal prolapse. Any SUI was also seen with prolapse and after reduction of prolapse for any occult SUI by cough stress test. Speculum examination was then performed for any vault prolapse or vaginal prolapse and any ulcer. Vaginal examination was then performed for any intraabdominal mass through vault. Rectovaginal examination was also done. Examination was also repeated after passing urine. Pelvic muscle function assessment was done using modified oxford grading system and rectovaginal examination was

performed to assess basal and contraction tone of anal sphincter complex. Baseline investigations were done for all cases. Urodynamic study was done only when women had urinary incontinence using cystometrogram and uroflometry.

All women were subjected to PFDI 20 Short term PFDI 20 after taking permission to use the same from the authors as per Barber *et al.* protocol^[14] and as per Flowchart 1. It is condition specific quality of life questionnaire for women with PFDs consisting of 20 item questionnaire with responses recorded as both yes and no on a 4-point scale that ranges from “Not at all” (0) to “Quite a Bit” (4).^[4] All patients underwent surgery in the form of vaginal sacrospinous fixation or abdominal sacrocolpopexy as per clinical situation and hospital protocol. Usually sacrospinal fixation was performed in most patients. While abdominal sacrocolpopexy was performed for severe and high risk case as per flowchart 1. Intraoperative examination for details of prolapse such as cystocele, rectocele, enterocele, vault prolapse, deficient perineum and complete perineum, perineal tear was made under anesthesia in all cases systematically in relation to hymenal remnants and was quantified as grading as first degree (vault drops to hymen or lower vagina) secondary degree (vault drops to introitus and third degree (vault protrudes outside introitus FDI-20 was then repeated on all patients at 6 months after surgery to know the impact of surgery on the score. The results of PFDI-20 before and after surgery were compared, and statistical analysis was performed.

Statistical analysis

The findings were compared using the sum of square of means and Chi-square test. The stages of vault prolapse on POPQ were compared with PFDI-20 inventory using Pearson’s coefficient after bivariate regression analysis. Assessment of coherence between the clinical evaluation, POPQ and PFDI-20 score was performed. The Chi-square test was used and the $P < 0.005$ was taken as significant.

RESULTS

The characteristics of patients in the present study are shown in Table 1. The symptomatology of patients, past surgery, obstetric, and other associated features are shown in Table 2. All patients were posthysterectomy vault prolapse in 15 (75%) had vaginal hysterectomy with anterior colporrhaphy and posterior colpoperineorrhaphy while 5 (25%) had abdominal hysterectomy with 3 (15%) for abnormal uterine bleeding and 2 (10%) for fibroid uterus. The symptoms (complaints), obstetrics factors and associated factors are shown in Table 2 with main symptoms being sensation of bulge on perineum

Table 1: Characteristics of patients with vault prolapse (n=20)

Characteristics	n (%)
Age (years)	
Range	38-66
Mean±SD	54.8±9.21
Parity	
Range	1-6
Mean±SD	3.5±1.2
BMI (kg/m ²)	
Range	19.2-29.7
Mean±SD	22.71±2.47
Socioeconomic status	
Lower	12 (60)
Moderate	7 (35)
Upper	1 (5)

BMI: Body mass index, SD: Standard deviation

Table 2: Symptomatology of patients of vault prolapse (n=20)

Characteristics	n (%)
Past surgery	20 (100)
Vaginal hysterectomy with anterior colporrhaphy and posterior colpoperineorrhaphy	15 (75)
AUB	3 (15)
AUB (fibroid)	2 (10)
Complaints	
Pressure in lower abdomen and perineum	11 (55)
Urinary retention	2 (10)
Stress urinary incontinence	5 (25)
Sensation of bulge in perineum	20 (100)
Dyspareunia	3 (15)
Bowel dysfunction	3 (15)
Fecal incontinence	3 (15)
Incomplete evacuation of stool	8 (40)
Constipation	12 (60)
Obstetric factors	
Normal vaginal delivery	15 (75)
Instrumental delivery	3 (15)
Prolonged labor	2 (10)
Caesarean section	1 (5)
Associated factors	
Chronic constipation	14 (70)
Chronic obstructive pulmonary disease	3 (15)
Chronic smoking	4 (20)
Obesity (BMI>25 kg/m ²)	2 (10)

AUB: Abdominal hysterectomy, BMI: Body mass index

in all 20 (100%), which was also most bothersome symptom.

The intraoperative examination was done as described in materials and methods, and its findings are shown in Table 3. All 20 (100%) women had varying grades of cystocele, rectocele, and vault prolapse. While 9 (45%) women had associated enterocele, on intraoperative

examination with which findings of POPQ were compared. Only patients with grade 2 and above were taken in the study.

The findings of POPQ are shown in Table 4. Although vault prolapse was observed in all 20 (100%) cases with both intraoperative findings and POPQ, cystocele and rectocele were picked up by POPQ in 18 (90%) cases only. On POPQ staging cystocele was Stage 0 in 2 (10%), Stage 1 in 2 (10%), Stage 2 in 6 (30%), Stage 3 in 10 (50%) cases (overall 18, 90%) while staging of rectocele was Stage 0 in 2 (10%), Stage 1 in 5 (25%), Stage 2 in 7 (35%), Stage 3 in 6 (30%) (overall 18, 90%), vault prolapse was seen as Stage 1 in 2 (10%), Stage 2 in 4 (20%), Stage 3 in 14 (70%) cases (overall

Table 3: Intraoperative examination findings and type of surgery performed in vault prolapse cases (n=20)

	Number of cases, n (%)
Type of prolapse	
Cystocele	20 (100)
Rectocele	20 (100)
Vault prolapse	20 (100)
Enterocoele	9 (45)
Surgery performed	
Right sided unilateral anterior vaginal sacrospinous fixation with anterior colporrhaphy and postcolpoperineorrhaphy	14 (70)
Abdominal sacrocolpopexy	6 (30)

Table 4: Pelvic Organ Prolapse Quantification classification (n=20)

Findings	n (%)
Cystocele	
Stage 0	2 (10)
Stage 1	2 (10)
Stage 2	6 (30)
Stage 3	10 (50)
Overall cystocele	18 (90)
Rectocele	
Stage 0	2 (10)
Stage 1	5 (25)
Stage 2	7 (35)
Stage 3	6 (30)
Overall rectocele	18 (90)
Vault prolapse	
Stage 0	0
Stage 1	2 (10)
Stage 2	4 (20)
Stage 3	14 (70)
Overall vault prolapse	20 (100)
Enterocoele	
Present	9 (45)
Absent	11 (55)

20, 100%). Enterocoele was seen in 9 (45%) cases which was same as detected by intraoperative findings.

PFDI 20 (containing 20 item questionnaire) was performed on all patients before surgery and 6 months after repair of vault prolapse as shown in Table 5. The range of PFDI-20 score before surgery ranged between 88 and 152 with mean being 123.00 ± 22.711 . There was a significant decrease in PFDI-20 after surgery for vault prolapse with PFDI-20 score ranging between 80 and 126 with mean being 106.40 ± 16.46 ($P < 0.001$).

Hence, surgery for vault prolapse could significantly reduce the PFDI-20 score. However, there was no difference in postoperative PFDI-20 in the two types of surgery. Mean PFDI-20 at 6 months was 107.40 with vaginal sacrospinous fixation and 105.30 with abdominal sacrocolpopexy ($p = 0.18$).

DISCUSSION

POP is defined as departure from normal sensation, structure or function experienced by the patient in relation to her pelvic organs (International Urogynaecological Association/International Continence Society).^[12] The pelvic floor has active and passive support system which is divided as anatomically and functionally with their main compartments; anterior compartment supporting bladder and urethra; the middle compartment supporting vagina and uterus and the posterior anorectal compartment.^[1,12] Vault prolapse is a common complication following vaginal (sometimes abdominal) hysterectomy with negative impact on women's quality of life due to associated urinary, anorectal and sexual dysfunction.^[15] International Continence Society has defined it as descent of vaginal cuff below a point which is 2 cm less than total vaginal length above hymen with upper vagina bulging into or outside the vagina.^[7] It is usually associated with cystocele, rectocele or enterocoele in up to 72% cases.^[16] In the present study, vault prolapse was preceded by vaginal hysterectomy in 75% cases and by abdominal hysterectomy in 25% cases. Associated cystocele and rectocele were present in all cases on intraoperative examination but on 90% cases on POPQ classification while enterocoele was present in 45%. Future vault prolapse can be prevented in most cases by repairing any enterocoele present at the time of primary surgery which are often missed or by performing routine McCall's Culdoplasty during vaginal hysterectomy in all cases.^[1,15]

Routine sacrospinous fixation at the time of vaginal hysterectomy is not recommended in all cases but prophylactic sacrospinous fixation or high uterosacral plication can be performed during vaginal hysterectomy who are at high risk of developing vault prolapse in

Table 5: Pelvic floor distress inventory-20 before and after surgery of vault prolapse (n=20)

Characteristics	PFDI-score (preoperative)	PFDI-score (postoperative)
Number of patients	20	20
Minimum PFDI score	88	80
Maximum PFDI score	152	126
Range of PFDI score	54	46
Mean PFDI score	123.00	106.40
SD	22.711	16.460
SD of mean	7.182	5.205

Paired *t*-test: mean PFDI preoperatively versus postoperatively $P < 0.001$ which is highly significant. PFDI: Pelvic floor distress inventory, SD: Standard deviation

future like obese women, diabetic, women with chronic condition with raised intraabdominal pressure like chronic obstructive airway disease, chronic constipation or poor collagen tissue.^[1,15-17]

The quantification of vault prolapse and detection of any associated prolapse (cystocele, rectocele, and enterocele) can be made out with POPQ classification as Baden Walker staging is less reliable.^[18] Magnetic Resonance Imaging (both static and dynamic) can be used in POP and vault prolapse to properly stage the disease and to detect any associated prolapse, especially enterocele but is expensive and has not been proven to be more accurate than POPQ in various studies.^[18-22]

PFDI-20 has been used globally as a reliable and valid tool for the PFDs including vault prolapse and has been validated in many languages of the world.^[2,23,24] In the present study we performed POPQ and PFDI-20 on all 20 women with posthysterectomy vault prolapse which was associated with cystocele and rectocele in all cases (100%) and enterocele in 45% cases. PFDI-20 scoring has been used to quantify vault prolapse and to see the effect of both conservative management (pelvic floor muscle training) and surgical treatment of vault prolapse with using native tissue or synthetic mesh.^[23,24]

In the present study all patients underwent surgery for vault prolapse in the form of vaginal sacrospinous fixation with anterior colporrhaphy or posterior colpoperineorrhaphy in 14 (70%) cases and abdominal sacrocolpopexy with cystocele and rectocele repair in rest 6 (30%) cases. There was significant decrease in PFDI-20 score. Mean PFDI preoperatively was 123.00 ± 22.71 . It was reduced to mean of 106.40 ± 16.48 , 6 months after surgery ($P < 0.001$) but there was no significant difference in preoperative and postoperative PFDI with two techniques of surgery ($p = 0.18$).

In the present study PFDI-20 was found to be clinically useful and relevant to quantify the staging of

posthysterectomy vault prolapse and to see its impact on quality of life and that appropriate surgery for the vault prolapse (both vaginal sacrospinous fixation and abdominal sacrocolpopexy) could reduce PFDI-20 score significantly. Our results are similar to other authors who observed PFDI-20 to be useful in vault prolapse and to see the impact of surgical method including robotic surgery.^[25] It can be seen that surgical treatment of vault prolapse by both vaginal and abdominal routes significantly lowered PFDI-20 and improved the quality of life of patients suffering from vault prolapse with no significant difference in two techniques of vault prolapse surgery.

The patients in the present study were operated as per the clinical protocol and were not randomized into two groups with unequal number in two groups (70% vaginal sacrospinous fixation for most cases, 30% abdominal sacrocolpopexy for high risk cases) which is a limitation of the study.

CONCLUSION

PFDI-20 is a useful tool in assess the impact of posthysterectomy vault prolapse on health of women and quality of life. It can also be used before and after various surgeries for vault prolapse to evaluate their relative efficacies.

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Conflicts of interest

There are no conflicts of interest.

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