

Urodynamic Changes in Pelvic Organ Prolapse and the Role of Surgery

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Abstract

Background: Pelvic organ prolapse (POP) is a major health problem of the “elderly” lady. The urological changes associated with POP and the beneficial effects of surgery on these changes continues to be controversial. We studied the urodynamic changes in POP and the effect of definitive surgery on these changes.

Methods: A total of 50 cases of POP, over a two year period, were subjected to urodynamic studies both pre and postoperatively and the data analyzed, to ascertain the effect of surgery on the urological profile of a patient with POP.

Result: Four of the 50 patients studied had demonstrable stress urinary incontinence and two of these benefited significantly after surgery. In addition it was observed that four new patients developed stress urinary incontinence (SUI) postoperatively. It was also observed that the values of Qmax significantly improved after surgery from 9.2ml/s to 18.6ml/s.

Conclusion: Definitive surgery improves the urological profile of the patient with POP, to a certain extent. A good clinical examination of patients with POP from the urological viewpoint, is essential preoperatively, to pick up the patients who are likely to develop stress incontinence postoperatively, so that corrective action can be initiated during surgery.

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Key Words : Pelvic organ prolapse (POP); Urodynamic studies; Stress incontinence; Filling phase; Voiding phase

Introduction

With an aging population pelvic organ prolapse (POP) is a major health problem. It is estimated that 11% of all women living in the United States will require at least one surgery for POP in their lifetime [1]. A study by Swift et al [2] of 1004 women aged 18-83 years presenting for routine gynecological examination revealed the distribution of Pelvic Organ Prolapse by POP quantification staging to be as follows: Stage 0 = 24%, Stage I = 38%, Stage II = 35% and Stage III- 3%.

Pelvic organ prolapse along with urinary incontinence, fecal incontinence, voiding and defecatory dysfunction make up the inter-related group of disorders collectively known as the “Disorders of the Pelvic Floor” [3] and these disorders share many common risk factors and often coexist with one another. The term urodynamics was first coined by DM Davis, to denote the study of storage and emptying phases of the lower urinary tract.

Material and Methods

An observational study consisted of 50 consecutive cases of advanced pelvic organ prolapse who came to Gynecology OPD of a mid-sized service hospital, and subsequently underwent surgery, from Jul 2005 to Jul 2007. Recruitment of cases was done serially as they presented to the out patient department. All patients were subjected to a preoperative

cystometrography (CMG) using an MMS II machine. Both the filling phase and the voiding phase were assessed and all parameters recorded on the multi-channel monitor. All the recruited cases underwent surgical correction of the POP using vaginal hysterectomy with pelvic floor repair alternatively called the Ward Mayo’s operation. Thereafter all the cases were subjected to a postoperative CMG within four weeks of surgery. The technique of surgery and suture materials used did not vary from case to case though the surgeon changed depending upon availability.

Only patients with third degree (Shaw’s classification) POP were included in this study. Patients with less than third degree prolapse, diabetes mellitus, nulliparous prolapse or patients in whom reproductive function was incomplete were excluded from the study. In addition extremely old patients who were unfit for surgery and patients with culture positive urinary tract infections were also excluded.

Means and standard deviations were calculated for all continuous variables and the paired ‘t’ test and the chi square test were used to determine statistically significant differences. The tabulation ‘t’ value for the appropriate degrees of freedom was 2.06 and was set at probability value less than 0.05 in order to determine significance.

Results

Out of the 50 patients studied, 16 (32%) were below the age of 50 and 34 (68%) were above the age of 50 (Table 1).

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60% of the patients who reported with POP had a parity of two or less and only 40% of the patients had a parity greater than two thus dispelling the notion that high parity predisposes to POP.

Table 2 shows the common urinary symptoms associated with POP. Most of the symptoms improved postoperatively with the exception of dysuria which increased postoperatively. The most common urinary symptom exhibited by patients with advanced POP was diurnal urinary frequency. This was seen in 26 (52%) patients and was followed by urgency, which was seen in 21 (42%) cases. There was no statistically significant change in the symptoms postoperatively except in the case of "difficulty in voiding".

It has been observed by various authors [4], that the number of patients with stress incontinence is inversely proportionate to the degree of POP. In the present study we recruited patients with advanced POP only and this could explain the small number of cases observed with stress incontinence. Burrows et al [4], reported an incidence of 59% in patients reporting with POP. Out of the eight (16%) patients who gave a history of stress leak only four (8%) had demonstrable leak on cystometrography. Out of these, two patients had a VLPP of less than 70 cm of water, suggesting an intrinsic sphincter deficiency being the causative factor rather than the prolapse. These two patients continued to have stress leak (on cystometrography) post operatively too. The remaining two patients who had demonstrable stress leak preoperatively became asymptomatic after surgery, probably due to the cystocele repair and Kelly's stitch which was applied in these two cases. However post operatively it was observed that four new patients had developed demonstrable stress leak (on CMG).

Table 3 and 4 detail the bladder sensations and detrusor activity during the filling phase. The parameters of bladder sensation post operatively are not statistically significant from those seen preoperatively. This is contrary to the expectation that due to the surgical dissection during cystocele repair, there would be some variation in bladder sensations. The two cases with unstable contractions observed post operatively were probably due to latent infection following catheterization, which was done for 72 hours as a routine after surgery.

Table 5 shows the findings of the parameters monitored in the voiding phase. The maximum flow rates observed in the patients with POP were universally low. The mean value was 9.2 ml/s, which is much lower than the normal values described by Abrams et al [5]. This figure showed a statistically significant rise after surgical correction of the POP. The mean values for detrusor pressures (Pdet) at maximum urine flow (Qmax) were always more than 25 cm of water in the pre and post operative groups, which suggests that advanced POP gives rise to mild degrees of urethral or outlet obstruction [6]. The post operative values however, do not appear to be significantly different, though the mean value has decreased in the post operative group. The other parameters tracked during the voiding phase, too did not show significant difference post operatively. There was a

definite fall in the residual volume, though this difference was not statistically significant.

Discussion

The International Continence Society committee on standardization of terminology of pelvic organ prolapse and pelvic floor dysfunction has enumerated the various urinary symptoms that are associated with pelvic organ prolapse. These symptoms are frequency of micturition, urgency and urge incontinence, stress urinary incontinence, hesitancy with prolonged urinary flow. Reduction of prolapse and positional alteration has been described as an essential prerequisite for initiating and completing the voiding process and this could explain the statistically significant improvement in the symptom "difficulty in micturition" seen postoperatively.

Post operatively there was no significant improvement in the symptom of urinary frequency. This could be a temporary phenomenon due to the effect of surgery and

Table 1
Overall demographics

Variable	Value	Percentage
a) > 70 years	4	8
b) 60-70 years	18	36
c) 50-60 years	12	24
d) < 50 years	16	32
Parity		
a) <2	02	04
b) = 2	28	56
c) >3	20	40
Previous vaginal deliveries	49	98
Previous LSCS deliveries	01	02
Menopausal status		
a) Pre Menopausal	11	22
b) Post Menopausal	39	78

Table 2
Urinary symptoms (pre & post operative)

Symptoms	Pre operative n (%)	Post operative n (%)	p value
Urinary frequency			
a) Nocturnal	10 (20)	08 (16)	> 0.05
b) Diurnal	26 (52)	27 (54)	> 0.05
c) Both	08 (16)	07 (14)	> 0.05
Urgency	21 (42)	13 (26)	> 0.05
Difficulty in voiding with prolonged urinary stream often requiring manual repositioning of prolapse	07 (14)	Nil	< 0.05
Dysuria	09 (18)	11 (22)	> 0.05
Feeling of incomplete evacuation	13 (26)	07 (14)	> 0.05
Stress urinary incontinence	08 (16)	06 (12)	> 0.05

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