The Relation of Urinary problems in Genital Prolapse with POPQ component

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ABSTRACT **Introduction:** *Pelvic organ prolapse quantification has been developed by ICS (International Continence Society) in 1996 to fill the lacunae in the previous classification which was vague. The POPQ classification is giving much more detailed information. The advantage of the same has been taken in our study of urological problems associated in genital prolapse to know its relation with POPQ stage.*

Method: *It is a prospective study of 100 patients coming to the Dr. DY Patil Medical College & Hospital, Pune. The symptoms related to the urinary tract like dysuria, frequency of micturition were noted along with a detailed laboratory examination of midstream urinary sample for the presence of pus cells. They were correlated with the POPQ stage measurement. All the data was collected & analyzed to know about the statistical significance.*

Result: *We found that dysuria, frequency of micturition & presence of significant number of pus cells in urine were found to be statistically significant as the measurement of the POPQ component was increasing.*

INTRODUCTION:

Genital prolapse is the most common entity found in the patients attending the Gynaecology OPD[1]. In fact the problem has been described in the oldest documented medical literature like the Egyptian papyri (Kahun papyri circa 1835 BCE).[2]

Prolapse refers to the downward displacement of the uterus, vaginal walls & surrounding structures like bladder, bowel & rectum from their normal anatomical positions. In severe cases the vaginal walls & cervix protrude outside the introitus & are visible & palpable. [2](panditwt, al.) Obviously the symptoms can be variable according to the part that is displaced.

In India it is found that in women visiting private clinics for gynaecological problems in Bengal, Delhi, Punjab & U.P., one in five patients is suffering from uterine prolapse(20 %). Whereas, in Northern India it is 7.6%, Eastern India 20%, Southern India 3.4%.[3,4]

The prolapse has been classified by different ways as shown in Fig.1. The most of the classification are based on criteria modified from Beechem& Baden et al. [5, 6]

The problem with the old classification is that it is subjective, depending upon visualization of descended part. So it is having disadvantages like inaccuracy and lots of inter observer & periodic variation. It being very vague, it is not useful in research & statistical study where accurate measurements are needed. Taking into consideration all these factors the ICS has developed a new classification i.e. POPQ classification which overcomes all these difficulties.

As our study is specifically related with urinary problems, we have focused only on measurement of anterior vaginal wall prolapse, which consists of cystocoel & urethrocoel.

Cystocele

A cystocele is a medical condition that occurs when the tough fibrous wall between a woman's bladder and her vagina (the pubocervical fascia) is torn by childbirth, allowing the bladder to herniate into the vagina. Urethrocoeles often occur with cystocoeles.

Figure 1: Cystocele

Classification

1. (grade 1) when the bladder droops only a short way into the vagina
2. (grade 2) the bladder sinks far enough to reach the opening of the vagina
3. (grade 3) cystocele occurs when the bladder bulges out through the opening of the vagina.[7]

Diagnosis

In more complex instances, additional testing will be required. A voiding cystourethrogram is a test that involves taking x-rays of the bladder during urination. This x-ray shows the shape of the bladder and lets the doctor see any problems that might block the normal flow of urine. Other tests may be needed to find or rule out problems in other parts of the urinary system like urinary calculus.

Pelvic organ prolapses are graded by

- Baden-Walker System,
- Shaw's System,
- Jeffcoate's classification
- The Pelvic Organ Prolapse Quantification (POP-Q) System.[7]

Anterior wall
- Upper 2/3 cystocele
- Lower 1/3 urethrocele

Posterior wall
- Upper 1/3 enterocele
- Middle 1/3 rectocele
- Lower 1/3 deficient perineum

Shaw's Classification
Uterine prolapse
- Grade 0 Normal position
- Grade 1 descent into vagina not reaching introitus
- Grade 2 descent up to the introitus
- Grade 3 descent outside the introitus
- Grade 4 Procidentia

Jeffcoate's classification
First degree: Descent of the uterus but cervix remains within the introitus

Second degree: Descent to the extent that cervix projects through the vulva when the woman is straining or standing

Third degree: complete procedentia. The entire uterus prolapses outside the vulva whole vagina or atleast the whole of its anterior wall, is everted.

Baden-Walker System for the Evaluation of Pelvic Organ Prolapse on Physical Examination
- 0 normal positions for each respective site
- 1 descent halfway to the hymen
- 2 descents to the hymen
- 3 descents halfway past the hymen
- 4 maximum possible descents for each site

POPQ System

| Stage	Description
0	No prolapse anterior and posterior points are all -3 cm, and C or D is between -TVL and -(TVL-2) cm.
1	The criteria for stage 0 are not met, and the most distal prolapse is more than 1 cm above the level of the hymen (less than -1 cm).
2	The most distal prolapse if between 1 cm above and 1 cm below the hymen (at least one point is -1, 0, or +1).
3	The most distal prolapse is more than 1 cm below the hymen but no further than 2 cm less than TVL.
4	Represents complete procidentia or vault eversion; the most distal prolapse protrudes to at least (TVL-2) cm.
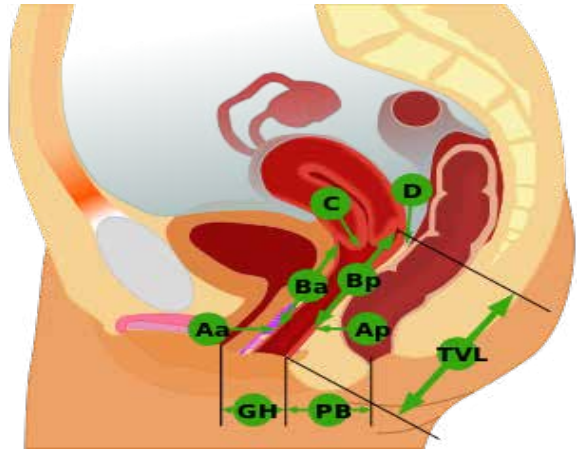
Figure 2: POPQ Points
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    There are three reference points anteriorly (Aa, Ba, and C) and three posteriorly (Ap, Bp, and D).
- Points Aa and Ap are 3 cm proximal to or above the hymenal ring anteriorly and posteriorly, respectively.
- Points Ba and Bp are defined as the lowest points of the prolapse between Aa anteriorly or Ap posteriorly and the vaginal apex.
- Anteriorly, the apex is point C (cervix), and posteriorly is point D (pouch of Douglas).
- In women after hysterectomy, point C is the vaginal cuff and point D is omitted
- the vaginal length at rest, the genital hiatus (gh)
- from the middle of the urethral meatus to the posterior hymenal ring, and the perineal body (pb) from the posterior aspect of the genital hiatus to the midanal opening.

If one goes through all these classifications, it will be noted that the POPQ classification is much superior compared to the older classifications in giving detailed information, that too with accurate measurement, in centimeters which can be used in statistical tests & research studies.

Vaginal vault Prolapse
The vaginal vault may prolapse after a hysterectomy, as there is no uterus supporting the interior end of the vagina. The incidence of vaginal vault prolapse is approximately 15% after hysterectomy due to uterine prolapse, and approximately 1% after hysterectomy due to other reasons.

Material & Methods:
This is prospective observational study in which permission of ethical committee was taken.

All subjects including study provided a form for written consent including necessary details required for patient.

Patients were greater than 18 years of age, speak and understand Marathi/Hindi/English, and also willing to come for follow up in gynecology clinic for follow up.

Following informed consent the subjects asked to empty their bladder for undergoing examine by using standard POPQ technique in the dorsal lithotomy position while performing a valsalva or cough.

Currently, pelvic organ prolapse was measured using the POPQ as described below.

There are three reference points anteriorly (Aa, Ba, and C) and three posteriorly (Ap, Bp and D). Points Aa and Ap are 3 cm proximal to or above the hymenal ring anteriorly and posteriorly, respectively. Points Ba and Bp are defined as lowest points of prolapse between Aa anteriorly or Ap posteriorly and the vaginal apex. Anteriorly, the apex is point C (cervix), and posteriorly is point D (pouch of Douglas). In women after hysterectomy, point C is the vaginal cuff and point D is omitted. Three other measurements are taken: the vaginal length at rest, the genital hiatus (gh) from the middle of the urethral meatus to the posterior hymenal ring, and the perineal body (pb) from the posterior aspect of the genital hiatus to the midanal opening.
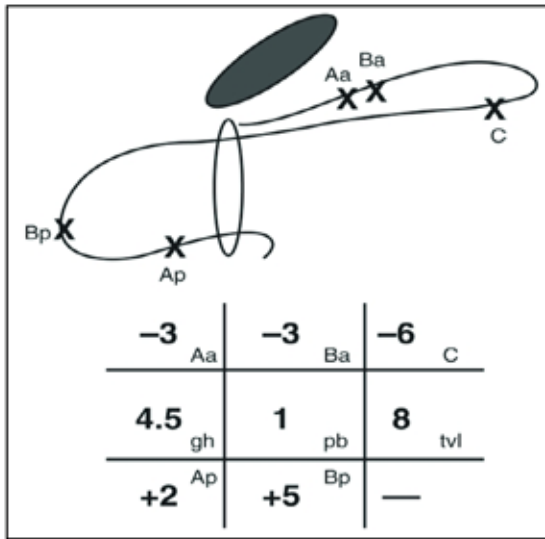

Figure 3: An example of measurements using the POP-Q system.

Grid and line diagrams of predominantly posterior support defect. Leading point of prolapsed is the upper posterior vaginal wall, point Bp (+5). Point Ap is 2 cm distal to hymen (+2) and vaginal cuff scar is 6 cm above hymen (-6). Cuff has undergone only 2 cm of descent because it would be at -8(total vaginal length) if it were properly supported. This represents stage Bp prolapse. [7]

This system was extensively studied and demonstrated excellent intra and interobserver reliability. In addition, since measure of 9 points was taken using centimeters, small differences were detected. [5, 6]

Each patient's measurements were noted in the grid. The symptoms were divided according to the severity of the stage in different groups, with actual measurements in cen-

timeters. After collection of data in detail, different types of statistical tests were applied as given in the results, to know about its significance.

Observations:

Table 1: Degree of uterine descent by Baden-walker classification

Degree of descent	No. Of cases	Percentage
I	4	5
II	14	16
III	41	48
Procedentia	26	31
Total	85	100

(15 patients were post hysterectomy, who were referred as a case of vault prolapse)

Maximum cases (48%) had 3rddegree uterine prolapse.

Table 2: Analysis of component of utero-vaginal prolapse

Parameter	No. Of cases	Percentage
Uterine descent	98	98
Anterior vaginal wall prolapsed	62	62
Posterior vaginal wall pro-lapsed	65	65

(Some patient had more than one component)

Uterine descent formed the most significant component in present study. It was found in 98% in cases which is maximum among patient of all uterovaginalprolapse.

Table 3: Analysis of Urinary symptoms /complaints

Symptoms	Number of cases	Percentage
Dysuria	48	48
Increase frequency of micturition	45	45
Burning micturition	46	46
Incomplete voiding	18	18
No complaint of urinary symptoms	38	38

(Some had more than one of symptoms)

Frequency of dysuria was in 48% cases which is maximum among patient of having urinary complaint.

Incomplete voiding was in only 18% cases which is minimum maximum among patient of having urinary complaint.

Table 4: Analysis of Dysuria patients with POPQ Component

POPQ	Ba(0)	Ba(+1)	Ba(+2)	Ba(+3)	Ba(+4)	Ba(+5)	Total
Dysuria pts	1	4	7	12	17	7	48
POPQ-A	Ba(0)/(3)	Ba(+1) /(6)		Ba(+2) /(10)			
No. of pts	1	4		7			
Percentage	33.33	66.67		70			

POPQ-B	Ba(+3) /(15)	Ba(+4) /(20)	Ba(+5) /(8)
No. of pts	12	17	7
Percentage	80	85	87.5

Fisher Exact probability test: p value: 0.04092   Significant p value: <0.05

P value is statistically significant.

Table 4 shows Relation of dysuria patients with POPQ component Ba.

Percentage of patient increases along with increase in value of POPQ component Ba.

Table 5: Analysis of increase frequency of urine with POPQ component

POPQ	Ba(0)	Ba(+1)	Ba(+2)	Ba(+3)	Ba(+4)	Ba(+5)	Total
pts increase freq	1	2	7	12	16	7	45

POPQ-A	Ba(0)/(3)	Ba(+1) /(6)	Ba(+2) /(10)
No. of pts	1	2	7
Percentage	33.33	33.33	70

POPQ-B	Ba(+3) /(15)	Ba(+4) /(20)	Ba(+5) /(8)
No. of pts	12	16	7
Percentage	75	80	87.5

Fisher Exact probability test: p value: 0.0145
Significant p value: <0.05

Table 5 shows dysuria patients with POPQ component Ba.

Percentage of patient increases along with increase in value of POPQ component Ba.

P value shows it is statistically significant.

Table 6: Analysis of no. Of patients with pus cells in POPQ component

POPQ	Ba(0)	Ba(+1)	Ba(+2)	Ba(+3)	Ba(+4)	Ba(+5)	Total
patients with pus cells	1	3	7	12	16	7	46

POPQ-A	Ba(0)/(3)	Ba(+1) /(6)	Ba(+2) /(10)
No. of pts	1	3	7
Percentage	33.33	50	70

POPQ-B	Ba(+3) /(15)	Ba(+4) /(20)	Ba(+5) /(8)
No. of pts	12	16	7
Percentage	80	80	87.5

Fisher Exact probability test: p value: 0.03462
Significant p value: <0.05

Table 6 shows Percentage of patient increases along with increase in value of POPQ component Ba.

It suggests that patients of pus cells in urine P value show it is statistically significant.

Table 7: Showing relation between POPQ component and Manual correction for passing urine

POPQ	Ba(0)	Ba(+1)	Ba(+2)	Ba(+3)	Ba(+4)	Ba(+5)	Total
Manual correction for passing urine	0	0	4	4	7	4	18

POPQ-A	Ba(0)/(3)	Ba(+1) /(6)	Ba(+2) /(10)
No. of pts	0	1	2
Percentage	0	16.66	20

POPQ-B	Ba(+3) /(15)	Ba(+4) /(20)	Ba(+5) /(8)
No. of pts	4	7	4
Percentage	26.67	35	50

Table 7 suggests that Percentage of patient requirement for manual correction increases along with increase in value of POPQ component Ba.

Table 8: Stress incontinence with POPQ

POPQ	Ba(0)	Ba(+1)	Ba(+2)	Ba(+3)	Ba(+4)	Ba(+5)	Total
Stress incontinence	0	0	1	1	2	2	6

Table 8 suggests that Percentage of patient of stress incontinence increases along with increase in value of POPQ component Ba

Number of patient for observation is less so we are unable to apply any statistical test

Results:

Degree of uterine descent:

In this study, out of 100 cases of uterine descent, 48% cases had 3rd degree uterine descent.16% cases had 2nd degree, 5% cases had 1st degree uterine descent and 31% cases had procidentia. Maximum patients had 3rd degree uterine descent.

Some degree of anterior vaginal wall prolapse was observed in 62% cases. Posterior vaginal wall prolapse was observed 65% case.

POPQ has relation with various Urinary complaints

1. Dysuria
2. Increase frequency of urine
3. Pus cells in urine investigation
4. Manual correction for passing urine
5. Stress incontinence

Urinary symptoms/complaints:

In this study urinary symptoms were present in 62% patients amongst urinary systems, increase frequency of micturation in 45%, Dysuria in 48%, Burning micturation in 46%, sense of incomplete voiding 18% and stress incontinence 5% cases. Some had more than one of symptoms.

Incidence of urinary symptoms was 35% as reported by Das (1968) [8]

Prolapse and stress urinary incontinence may or may not co-exist and are not directly reported. Arnold et al (1972) [9]

Dysuria patient with POPQ component:

In this table dysuria was studied in 48 patients amongst them maximum patients 87.5% had POPQ (Ba+5) followed by 85% having POPQ Ba +4, 80% having POPQ Ba+3, 70% having POPQ Ba+2, 66.67% having POPQ Ba+1 and lastly only 33.33% had POPQ Ba(0).

Study shows that percentage of patient increases along with increase in value of POPQ component Ba

By Fisher Exact Probability Test we found p value is statistically significant.

This type of study which correlates clinically with measurement of prolapse in centimeters as per POPQ classification is possible by POPQ method only and not possible by old methods.

Analysis of increase frequency of urine with POPQ component Ba:

In this study as Table 5 there were 45 patients under observation. 87.5% patient had complaint of increase in frequency of urine that had POPQ Ba+5 component. Followed by 80% patient having POPQ Ba+4 component. There were 75% patients having POPQ Ba+3 component and 70% patient having POPQ Ba+2 component. There were 33.33% patients in POPQ Ba+1 & in POPQ Ba (0) component.

Observation shows that patient of increase frequency of urine increases according to increase in value of POPQ Ba component from Ba(0) to Ba(+5)

By Fisher Exact Probability Test we found p value is statistically significant.

This type of study which correlates clinically with measurement of prolapse in centimeters as per POPQ classification is possible by POPQ method only and not possible by old methods.

Analysis of Patients with pus cells in urine with POPQ component Ba:

In this study 46 patients of prolapse having cystocele were studied who had urine report with pus cells as Table 6 there were 46 patients under observation. 87.5% patient had complaint of increase in frequency of urine that had POPQ Ba+5 component. Followed by 80% patient having POPQ Ba+4 component. There were 80% patients having POPQ Ba+3 components and 70% patient having POPQ Ba+2 component. There were 50% patients in POPQ Ba+1 and there were 33.33% patients in POPQ Ba (0) component.

Observation shows that patient of urine report with pus cells increases according to increase in value of POPQ Ba component from Ba(0) to Ba(+5)

By Fisher Exact Probability Test we found p value is statistically significant.

This type of study which correlates clinically with measurement of prolapse in centimeters as per POPQ classification is possible by POPQ method only and not possible by old methods.

Relation between requirement of manual correction for passing urine with POPQ component Ba:

In this study 18 patients of prolapse having cystocele were studied who had requirement of manual correction for passing urine. As Table 7 there were 18 patients under observation. 50% patient had complaint of requirement of manual correction for passing urine that had POPQ Ba+5 component. Followed by 35% patient having POPQ Ba+4 component. There were 27% patients having POPQ Ba+3 component and 20% patient having POPQ Ba+2 component. There were 17% patients in POPQ Ba+1 and there were 0% patients in POPQ Ba (0) component.

Observation shows that patient of requirement for manual correction for passing urine increases according to increase in value of POPQ Ba component from Ba(0) to Ba(+5)

This type of study which correlates clinically with measurement of prolapse in centimeters as per POPQ classification is possible by POPQ method only and not possible by old methods.

Relation between stress incontinence with POPQ component Ba:

We had 6 patients for above study as table 8 study shows that 2 patients (33.33%) had complaint of stress incontinence having POPQ Ba(+5)

Statistical study cannot be done due to very small figure of patients.

This type of study which correlates clinically with measurement of prolapse in centimeters as per POPQ classification is possible by POPQ method only and not possible by old methods.

Discussion:

As described above, the POPQ classification is very specific, & gives an accurate idea, due to the measurement in centimeters, required for statistical & research purpose,

due to which it has been made possible to conduct our study.

In the past the findings were described according to the visualization of the cystocoel as small, moderate & large cystocoel. Obviously it was responsible for urinary problems like frequency of micturition & dysuria. Due to unavailability of the POPQ classification in the past (before 1996), the observer was only able to quote figures of urinary problems in general. For example: UTI was noted in 42% by Rao in 1969[10] & 35% by Bhargav in 1983[11]. Today due to POPQ classification we have been able to study in much more detail due to the measurement in centimeters. It clearly shows that increasing measurement is associated with increasing number of patients of dysuria, frequency of micturition & UTI. Most importantly we have been able to apply statistical tests of significance to support our research study.

Conclusion:

Our study has shown that there is definite correlation between severity of symptoms & POPQ component. We have not come across any type of such study in literature & we think that more studies should be done on this problem so as to confirm the results. It obviously adds much to our knowledge of the genital prolapse.

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