

Analysis of the Outcomes of Vaginal Hysterectomy and Pelvic Floor Repair Using Pop-Q Classification

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ABSTRACT

Aims and Objective: To assess the relief of symptoms and analyse the surgical outcomes of women with pelvic organ prolapse (POP)

Material and Methods: A total of 100 women participated in the study. 17 patients were excluded as they were lost to follow-up and the data from the remaining 83 patients was analysed. Vaginal hysterectomy was done in all cases. Site specific repair was done according to the defect present. Patients were followed post operatively with regard to symptom relief and anatomical correction was analysed at 6 months using Pelvic Organ Prolapse-Quantification (POP-Q) System.

Results: The highest incidence of POP was between 61 to 70 years of age and in multiparous women with parity more than 4. 67.47% had stage III prolapse when measured using the POPQ classification. Vaginal bulge was the commonest complaint seen in 95.18% of the patients. Low back ache was the least relieved symptom at follow-up. However, the improvement of all symptoms was significant (p value<0.05). The mean length of Point Ba preoperatively was +0.67 (Range: -3 to +6, SD: 2.46) and postoperatively was

-2.79 (Range: +2 to +3, SD: 0.78). The mean length of Point Bp preoperatively was +1.11 (Range: -3 to

+5, SD: 2.38) and postoperatively was -2.76 (Range: +4 to -3, SD: 0.96). The mean length of point C

preoperatively was -2.43 (Range: -8.5 to +10, SD: 5.17) and postoperatively was -7.93 (Range: -4 to -10, SD: 2.54). There was significant anatomical restoration of all POP-Q parameters postoperatively (p-value<0.05).

Conclusion: There is significant anatomical restoration and symptom relief after surgery.

Keywords: Pelvic organ prolapse, Pelvic organ prolapse quantification

INTRODUCTION

Pelvic organ prolapse (POP) is a bulge or protrusion of pelvic organs and their associated vaginal segments into or through the vagina⁽¹⁾. It is one of the most common diagnosis arrived at by health care providers, particularly obstetricians and gynaecologists. The symptoms of this condition can be diverse ranging from minor urinary symptoms to those that significantly affect the quality of life of patients affected by it. Pelvic organ prolapse (POP), when defined by symptoms, has a prevalence of 3-6% and up to 50% when based upon vaginal examination⁽²⁾. Management decisions depend on the degree of prolapse and symptoms caused by it. Therefore, appropriate staging or grading of the prolapse becomes imperative to make clinical decisions regarding management. Over the past few decades, researchers and clinicians have devised various methods to quantify the degree of prolapse. The POP-Q classification system is a staging system used for grading pelvic organ prolapse. It was first published in an article in 1996 by Bump et al, and subsequently approved by the International Continence Society (ICS), the American Urogynecologic Society (AUGS) and the Society of Gynecologic Surgeons (SGS) for standardized description of pelvic organ prolapse in women⁽³⁾⁽⁴⁾. The advantages of this classification system are that it is site specific and objective, which makes it an excellent tool for clinical use as well as research purposes⁽⁵⁾. POP-Q classification being a standardized tool, the documentation, comparison and communication of clinical findings becomes easier as compared to other classification systems. The

other overriding advantage of this classification system is its good inter-observer and intra-observer reliability⁽⁶⁾. It has six defined points and three other measurements that are plotted in a 3x3 tic-tac grid. This prospective analytical study pertains to a patient population opting for treatment at a tertiary healthcare centre, IMS & SUM Hospital, Bhubaneswar. POP-Q measurements and symptoms prior to surgery were compared to the same 6 months post-surgery in patients consenting for the study. The results were analysed and presented with the aim of studying the outcomes of vaginal hysterectomy with pelvic floor repair and the symptoms relief thus obtained.

MATERIALS AND METHODS

A Prospective analytical study was done. Patients with uterovaginal prolapse admitted in the Dept. of Obstetrics and Gynaecology, to undergo vaginal hysterectomy with pelvic floor repair were enrolled for this study from June, 2018 to May, 2020. Sim's speculum and a graduated scale was used as tool for measurement of the extent of prolapse. The total number of patients who consented for the study and were included in the study was 100. 17 patients did not return for follow-up at 6 months post-surgery and were hence excluded. The data for the remaining 83 patients was collected and analysed after implementing the informed consent process.

Data Collection Procedure: After implementing informed consent process, a detailed patient history was taken regarding the primary symptoms and any other associated complaints. Examination was performed to confirm the diagnosis of uterovaginal prolapse. Questionnaires and evaluation forms were used to collect data on admission. Demographic data, clinical characteristics, surgical outcomes and POP-Q measurements prior to and post-surgery were recorded. The Data obtained was tabulated in Microsoft Excel 2007 and subjected to statistical analysis using SPSS Ver. 25. Mean \pm standard deviation or rate (%) was used to express the results. Significance of the data was tested using Student's *t* test and the χ^2 test. A two-sided *p* value < 0.05 was considered statistically significant.

RESULTS

The mean age of patients in this study was 60.29 ± 11.3 years. The most common age group of patients who had pelvic organ prolapse is between 61-70 years (37.35%, *n*=31) as seen in Table(1). The highest incidence of pelvic organ prolapse is seen in patients having a BMI between 25 kg/m² and 29.9 kg/m² (56.63%, *n*=47) (Table 2). The mean BMI of the patients in the current study was 24.4 ± 6.93 kg/m². As seen from the Table(3), multiparous patients with 4 or more normal vaginal deliveries were seen to be having the highest incidence of prolapse (50.60%, *n*=42). It is evident from Table (4) that women who delivered vaginally had a higher incidence of prolapse (90.36%, *n*=75) as compared to women who underwent LSCS (9.64%, *n*=8) with a significant *p*-value < 0.0001 . Amongst the 75 women who delivered vaginally, 54 women (65.06%) delivered without the aid of any instrumentation whereas 21 women (25.3%) gave a history of instrumental vaginal delivery. Forceps were used in 16 women (19.28%) and ventouse was applied in 5 women (6.02%). 79 out of the 83 patients presented with vaginal bulge or something coming out of the vagina which accounted for 95.18% of the participants. Low backache was the second most common complaint seen in 36 patients (43.37%). Difficulty in coitus, difficulty in defecation and difficulty in walking were seen in 21(25.3%), 20 (24.1%) and 11 (13.25%) patients respectively as seen in Table(5). As seen in Table (6), incomplete voiding was the most commonly seen urinary symptom noticed in 50 out of 83 patients (60.24%). Increased frequency of micturition was the second most common complaint seen in 25 patients (30.12%). Dysuria and urinary urgency were seen in 21 (25.3%) and 4 (4.82%) patients respectively. Vaginal hysterectomy and anterior colporrhaphy were done in all 83 patients (100%). Posterior colporrhaphy was done in 74 out of the 83 patients accounting for 89.16% (Table 7). As evidenced by Table (8), Stage III pelvic organ prolapse was the most common stage in the study population, 56 patients having Stage III prolapse (67.47%). This was followed by 17 patients having Stage II prolapse (20.48%). 9 patients (10.84%) had Stage IV prolapse and only 1 patient (10.84%) had Stage I prolapse. Table (9) show that at the follow-up done at 6 months post-surgery, 6 patients had Stage II prolapse (7.23%) and 2 patients had Stage III prolapse (2.41%). At the follow-up done at 6 months of surgery, only 8 women (9.64 %) had prolapse as measured by the POP-Q classification. Of these 8 women, 2 women (2.41 %) had Stage III prolapse and 6 women (7.23 %) had Stage II prolapse (Table 10). At follow-up, only 1 patient accounting for 1.2% complained of vaginal bulge or something coming out of the vagina. 17 patients (20.48%) had low backache which was the most persistent complaint seen. Difficulty in coitus and difficulty in defecation were seen in 8 (9.64%) and 2 (2.41%) patients respectively. Difficulty in walking and white/ watery discharge were relieved in all the patients (Table 11). All the 83 patients in the study who returned for follow-up were relieved of incomplete voiding, increased frequency of micturition and urinary urgency as seen in Table (12). 6 patients (7.23%) had dysuria at follow-up. All the 83 women who reported for follow-up had significant relief from symptoms as evidenced by the data shown in Table (12). Only 1 woman (1.2%) complained of mass per vaginum as compared to 79 women (95.18%) prior to surgery with a significant *p*-value < 0.0001 . The most common complaint in the follow-up group was low backache that was seen in 17 women (20.48%). Difficulty in defecation reduced from 24.1% (*n*=20) to 2.41% (*n*=2) of women. Coital difficulty persisted in 9.64% (*n*=8) of women post-surgery. There was however significant symptom relief of all the symptoms at follow-up (Table 12). All the 83 women who reported for follow-up had significant relief from urinary symptoms. 7.23% (*n*=6) had persistent dysuria, which was also the most common

complaint noticed in the follow-up group. None of the patients at follow-up complained of incomplete voiding, increased frequency of micturition or urinary urgency which were seen prior to surgery. Therefore, it can be concluded that there was significant relief of all the urinary symptoms at follow-up as evidenced by Table (13). Anatomical restoration was found in all stages of prolapse as seen in Table (14). There was significant restoration in anatomy of point Ba, Bp and C when analysed with the POP-Q classification, which is tabulated in Table (14).

DISCUSSION

Pelvic organ prolapse is a fairly common gynecological diagnosis that compels women to seek specialist care to address distressful symptoms that adversely impact the daily activities and quality of life of women suffering from this condition. Around half of all women above 50 years of age complain of symptomatic prolapse⁽⁷⁾⁽⁸⁾. The worldwide prevalence of uterovaginal prolapse is between 2% and 20%⁽⁹⁾. The incidence is increasing due to the increased aging and life expectancy of the geriatric female population. It has been estimated that the lifetime risk of a woman of undergoing surgery for a pelvic floor disorder is 11% up to the age of 80 years in the United States⁽⁹⁾ and maybe as high as 20%⁽¹⁰⁾⁽¹¹⁾. Another study has cited that pelvic organ prolapse affects up to 40% of multiparous women above the age of 35 years⁽¹²⁾.

A significant proportion of women affected by pelvic organ prolapse according to statistics gathered from the women's Health Initiative revealed that vaginal delivery served as a significant risk factor. In a study by Janani GD et al⁽¹³⁾, the highest incidence of prolapse amongst the study participants was seen in multiparae with four or more vaginal deliveries at 44%. This is similar to our study finding where 50.60% (n=42) patients were multiparous women with four or more vaginal deliveries. In a study by Dhama et al, only 7 out of 100 patients had just 2 vaginal deliveries whereas the remaining 93 of them were para 3 or above⁽¹⁴⁾. Vaginal delivery disturbs, stretches and sometimes tears the supports of the pelvic viscera. Although the exact mechanism is poorly understood, it could be due to premature bearing down before full dilatation of the cervix. Denervation changes have been documented in the pelvic floor and sphincter following vaginal delivery.

90.36% of the women (n=75) who participated in our study delivered vaginally as compared to the rest of them (n=8, 9.64%) who underwent lower segment Cesarean section. A study done by Trutnovsky et al revealed similar results and concluded that there was a link between vaginal delivery and symptoms and signs of pelvic organ prolapse⁽¹⁵⁾. Similar findings have also been seen in a Spanish study where pelvic organ prolapse was seen in only 7% of the women who gave birth through a Cesarean section⁽¹⁶⁾ and a multicenter study done in the United States⁽¹⁷⁾. In the same study done by Trutnovsky et al, 25.2% had at least one forceps delivery or a failed trial of forceps and 65.3% of women had normal vaginal delivery or a vacuum assisted delivery. These statistics are very similar to our study findings where 71.08% of the patients had a normal vaginal delivery or a vacuum assisted delivery. 19.28% of the women had a forceps delivery in our study. As seen, the number of women who underwent a forceps delivery is slightly less in our study. This could be attributed to the fact that around 54.21% of the women in our study were above the age of 60 years and had home deliveries, possibly with the help of midwives who are untrained in the application of forceps. Overstretching or prolonged distension of the vagina with disruption of its fascial envelope is more conducive to vaginal prolapse than is obvious tearing.

When classified according to the age, 37.35% (n=31) of the patients were between 61 to 70 years of age and 54.21% (n=45) of the patients were above 61 years of age. 21.69% (n=18) of the patients belonged to the age group of 41 to 50 years and 19.28% (n=16) were aged between 51 to 60 years of age. Only 1 patient (1.2%) was above 80 years of age. 56.3% (n=45) of the patients were aged between 41 to 60 years of age in a descriptive study by Pradhan et al⁽¹⁸⁾. In the same study 26.3% (n=21) patients were above 60 years of age. In a prospective observational study of 100 patients by Dhama V et al 44% of the patients were between 46 to 50 years of age⁽¹⁴⁾. The mean age of patients in this study was 47 years. 83% of the patients in a study by Verma D were above 35 years of age⁽¹⁹⁾. Pelvic organ prolapse was seen at higher ages in our study possibly due to a higher number of rural women seeking healthcare at our institution. Women belonging to such populations have barriers to accessing healthcare such as lack of accessibility, transport facilities, societal taboos or lack of awareness that prevents them from seeking healthcare at earlier ages or until it significantly affects their quality of life. The atrophy of the supporting tissues at menopause act as the precipitating factor in causing prolapse in women with congenital or developmental weakness of the pelvic floor and other obstetrical injuries to the pelvic floor.

In our study, the highest incidence of prolapse was seen in patients having a BMI between 25 kg/m² and 29.9 kg/m² (56.63%, n=47). The mean BMI of patients in our study was 24.4 +- 6.93 kg/m². Multiple studies⁽²⁰⁾⁽²¹⁾⁽²²⁾ have shown that the prevalence of prolapse is higher in women with higher BMI.

According to symptoms analysis prior to surgery, 95.18% (n=79) patients had vaginal bulging sensation or something coming out of the vagina. This is similarly seen in a study by Janani GD et al where 91% (n=79) patients⁽¹³⁾ and in a

study by Verma D et al where 77% (n=77) patients complained of something coming out of the vagina⁽¹⁹⁾. Mishra et al reported this as the commonest presentation in a retrospective descriptive study (n=164, 73.1%)⁽⁸⁾. O P Awotunde et al reported that 96% patients complained of vaginal bulging⁽²³⁾. The complaint of a vaginal bulge has a 76% negative predictive point of time during the course of the disease progression when women seek professional or specialist help. Women having access to or seeking healthcare earlier during the disease progression may do so at a lower stage of prolapse compared to those women who neglect it and allow it to progress to higher stages.

At the follow-up done 6 months post-surgery, none of the patients presented with stage I and stage III prolapse. 7.23% (n=6) and 2.41% (n=2) patients presented with stage II and stage III prolapse respectively. Janani GD et al reported that none of the patients had stage I prolapse, 1.1% (n=1) had stage IV prolapse, 2.3% (n=2) had stage II prolapse and 10.4% (n=9) had stage III prolapse⁽¹³⁾. In our study, none of the patients presented with vault prolapse. Amongst the patients who presented with stage II prolapse, 4.82% (n=4) had anterior compartment prolapse and 2.41% (n=2) had posterior compartment prolapse. 1.2% (n=1) had stage III anterior compartment prolapse and 1.2% (n=1) had stage III posterior compartment prolapse. None of the patients had any immediate postoperative complications. At the follow-up done 6 months post-surgery, 20.48% (n=17) had persistence of low backache, 9.64% (n=8) had difficulty in coitus. The cause of difficulty in coitus during the pre-operative period was due to presence of mass per vaginam or vaginal bulge sensation but postoperatively, it was due to dyspareunia. 2.41% (n=2) had difficulty in defecation. 1.2% (n=1) had vaginal bulge sensation. This patient had posterior compartment stage III prolapse. All patients were relieved of difficulty in walking and white/watery discharge per vaginum. When pre-operative and postoperative symptoms were compared, there was significant relief of all symptoms (p value <0.05). Janani GD et al reported similar outcomes with significant relief of all symptoms after vaginal hysterectomy with pelvic floor repair⁽¹³⁾. M.G.Ucar et al concluded that women who underwent vaginal hysterectomy with prolapse surgery for stage 2 or higher uterine prolapse experienced improvement in their sexual lives post-surgery⁽²⁵⁾. This has been corroborated with studies by Ulrich et al⁽²⁶⁾, Glavind et al⁽²⁷⁾ and Thakar et al⁽²⁸⁾. However, a study by Occhino et al concludes that sexual function remains unchanged⁽²⁹⁾. According to Helstrom et al, sexual function may become worse after surgery for pelvic organ prolapse⁽³⁰⁾. In a study by Barber et al, the subjective cure for vaginal bulge symptoms occurred in 92.1% of the patients⁽³¹⁾. This variation in sexual function post-surgery may be due to the use of varied questionnaires. It could also be due to differences in the operative technique employed or differing population characteristics. Other factors such as age, prior surgery, cultural characteristics and parity may also play a vital role in influencing outcomes. 24.1% (n=20) had difficulty in defecation pre-operatively as compared to 2.41% (n=2) 6 months postoperatively. This is comparable to a study by Bradley et al where they reported significant association between obstructive bowel disorder and posterior wall descent⁽³²⁾. Digesu et al reported similar association between posterior wall prolapse and bowel symptoms⁽³³⁾.

Urinary symptoms relief was also compared at follow-up done 6 months post-surgery. Incomplete voiding, increased frequency of micturition and urinary urgency were completely relieved in all patients. 7.23% (n=6) had dysuria postoperatively. However, there was significant relief of all urinary symptoms (p-value <0.05). Similarly, Janani GD et al found that all the patients in their study had complete cure from incomplete voiding, increased frequency of micturition and stress urinary incontinence at 6 months post-surgery⁽¹³⁾. There was a significant improvement of all urinary symptoms despite persistence of dysuria in 12% (n=10) of the patients. In a study by Pradhan et al, all the patients were questioned verbally before examination regarding set of urinary symptoms. Majority of the patients, 70 out of 80 (87.5%) had increased frequency of micturition, 71 of 80 (88.8%) had dysuria, 52 of 80 (65%) had stress urinary incontinence, 58 of 80 (72.5%) complained of incomplete evacuation, but comparatively small number of patients had symptoms of urinary retention 22 of 80 (27.5%)⁽¹⁸⁾. Similar to our study, a study conducted by Marijke et al conclude that there was significant association between urinary symptoms and anterior wall prolapse⁽³⁴⁾. Swift et al also concluded that women with pelvic organ prolapse with the leading edge of the prolapse beyond the hymenal remnants (some stage II and all stage III) had increased urinary symptoms⁽³⁵⁾.

Anatomical restoration was also evaluated in our study. The mean length of point Ba preoperatively was +0.67 (Range: -3 to +6, SD: 2.46) and postoperatively was -2.79 (Range: +2 to +3, SD: 0.78). The mean length of point Bp preoperatively was +1.11 (Range: -3 to +5, SD: 2.38) and postoperatively was -2.76 (Range: +4 to -3, SD: 0.96). The mean length of point C preoperatively was -2.43 (Range: -8.5 to +10, SD: 5.17) and postoperatively was -7.93 (Range: -4 to -10, SD: 2.54). There was significant anatomical restoration of all POP-Q parameters postoperatively (p-value <0.05). Yuvaraj TP et al reported in their study that the average preoperative scoring was (Ba +3.5, C +4, Bp +2.2). The average postoperative scoring was (Ba -3.2, C -6, Bp -3.2)⁽³⁶⁾. Krissi et al reported that preoperative mean of Ba was 1.2 ± 1.6 , preoperative mean of Bp was 1.2 ± 1 and preoperative mean of point C was 0.2 ± 2.3 ⁽³⁷⁾. In a retrospective study of 89 women by Levy et al undergoing transvaginal mesh repair for stage > 3 anterior vaginal wall prolapse, the authors have concluded that the preoperative Ba measurement (< 4 cm) is a favourable predictor for surgical outcome⁽³⁸⁾. Janani GD et al have reported that the mean length of the Ba point preoperatively was +4.05 (Range: -1 to +9 with standard deviation of 2.2). The mean length of point Bp preoperatively was +1.8 (Range: -2 to +8

with standard deviation of 2.6). The mean length of point C preoperatively was +3.5 (Range: -6 to +10 with standard deviation of 3.6)⁽¹³⁾. Although variations exist between absolute means of points Ba, Bp and C in various studies, the studies have concluded that there is significant anatomical restoration of all points post-surgery.

CONCLUSION

Multiparous patients with 4 or more normal vaginal deliveries were seen to be having the highest incidence of prolapse (50.60%) in our study. Vaginal delivery is a significant risk factor in the development of prolapse. The high incidence of pelvic organ prolapse in the older age groups is because of weakening of the uterovaginal support. Most common complaints are vaginal bulge or something coming out of vagina followed by urinary symptoms and low back ache. At follow-up, all the general as well as urinary symptoms were significantly relieved after vaginal hysterectomy with pelvic floor repair surgery. Anatomical restoration as measured by POP-Q classification was also significant post-surgery.

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