

A descriptive study of complications following vaginal surgeries for genital prolapse



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ABSTRACT

Background: Pelvic organ prolapse is the descent of the pelvic organs into the vagina accompanied by urinary, bowel, and sexual. Many types of surgeries are done to fix the organ prolapse. **Aims and Objectives:** This study aims to study the intra-operative and immediate post-operative complications in patients undergoing surgery for genital prolapse. The study also aims to follow the patients for a period of 1 year evaluate the possible morbidity during the period and also assess the factors which contribute to this morbidity. **Materials and Methods:** The present study was conducted in a tertiary care hospital in Puducherry among 121 patients who were admitted in the department of obstetrics and gynecology for genital prolapse. It was intended to study the intraoperative, early post-operative, and long-term complications among these patients who underwent vaginal surgeries for genital prolapse. **Results:** Ward Mayo's operation was done in the age group of 45–50 years and Manchester repair was done in the age group of 30–35 years. Patients who underwent Ward Mayo's procedure had a parity of 3.5. Nearly 25% of patients had a parity of 25. There was a significant difference in operating time when surgeries were done by consultants when compared to senior residents ($P=0.002$) but there was no significant difference in blood loss ($P=0.070$). A significant increase in blood loss and operating time was noted when vaginal hysterectomy was combined with both anterior and posterior repair. In cases of complications, it was prolonged. Backache (4.95%, 4.13%, and 4.13) and psychological problems (4.13%, 6.61%, and 6.61%) after 6 weeks, 6 months, and 1 year, respectively, were common long-term complications that could be attributed to decreased awareness among our women. **Conclusion:** It is concluded from the study that vaginal surgeries for genital prolapse have lesser complications both intra-operatively and during the post-operative period. The patient's characteristics such as age, parity, other illnesses, and surgical details such as choice of the operation, experience of the surgeon, additional procedures performed, blood loss, and antibiotic usage influence the morbidities associated with the surgery.

Key words: Anterior repair; Hysterectomy; Manchester; Posterior repair; Ward mayo

INTRODUCTION

Pelvic organ prolapse is the descent of the pelvic organs into the vagina accompanied by bladder, bowel, and sexual symptoms. The incidence is difficult to determine, as many women do not seek medical advice. It has been estimated that

a half of parous women lose pelvic floor support resulting in some degree of prolapse, and that of these women only 10–20% seek medical care. The incidence of prolapse increases as life expectancy increases.¹ The life time risk of undergoing an operation for prolapse or incontinence by 80 years is 11% but it is grossly under estimated. The aims

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of surgical correction of prolapse are relief of symptoms with restoration of normal anatomy and preservation of coital function with urinary and anal continence. Injury after child birth involves pelvic floor and all the pelvic organ supports. When more than one compartment (apical, anterior, or posterior) is involved, a combination corrective procedure may be needed. The surgical methods are safer with the advances in anesthesia, antibiotics, antisepsis, blood transfusion, and intravenous therapy.²

Procedures to re-establish apical support include culdoplasty techniques, uterosacral ligament suspension, sacrospinous suspension, and colpopexy. Repair of anterior compartment defects can be achieved with colporrhaphy and para vaginal repair. Posterior compartment defects are repaired with site-specific recto vaginal repair and colpoperineorrhaphy.³ This study aims to study the intra-operative and immediate post-operative complications in patients undergoing surgery for genital prolapse. The study also aims to follow the patients for a period of 1 year and evaluates the possible morbidity during the period and also to assess the factors which contribute to this morbidity.

Aims and objectives

This study aims to study the intra-operative and immediate post-operative complications in patients undergoing surgery for genital prolapse. The study also aims to follow the patients for a period of 1 year evaluate the possible morbidity during the period and also assess the factors which contribute to this morbidity.

MATERIALS AND METHODS

This prospective study was conducted in the department of obstetrics and gynecology in a tertiary care hospital for 1.5 years. It is a descriptive study which included 121 patients who underwent vaginal surgery for genital prolapse fulfilling the inclusion and exclusion criteria. The participants were followed for a period of 1 year. Inclusion criteria included patient's age <60 years, hemoglobin (Hb) 10 g% or above, Women with genital prolapse to procidentia, Manchester repair or ward mayo's operation with or without Kelly's repair for stress incontinence. Exclusion criteria included first degree genital prolapse, Sling operation for prolapse, Nulliparous prolapse, Recurrent prolapse, and vault prolapse and those who are not able to come for follow-up for 1 year.

A detailed history was taken which comprised of presenting symptoms, menstrual, obstetric, and medical and surgical history. Complete general examination and systemic examination were performed. Breast and thyroid were examined for any abnormalities. Abdominal examination

was done to determine the presence of mass or any other abnormalities. Speculum and bimanual vaginally examination were done. Pap smear was taken for the participants. The presence of cystocoele, rectocoele, enterocoele, descent of cervix, uterine size, mobility, and adrenal mass was noted. Stress incontinence if any was demonstrated. The following investigations were done such as Hb, urine routine and microscopy, culture and sensitivity, blood urea, and sugar chest X-ray for more than 40 years and PAP smear.

Intra-operative anesthetic complications were noted. The duration of surgery was recorded as the time taken from the surgical incision to vaginal packing. The blood loss during surgery was accounted by the total number of mops and gauze pieces soaked with blood and blood aspirated. Blood transfusion was given considering the blood loss at the time of surgery affecting the vitals of the patients (tachycardia and hypotension) or in the post-operative period if Hb <8 g%. Complications during surgery such as bladder, bowel, and ureteric injury if any were noted. Febrile morbidity defined as oral temperature of 100 F or greater on any 2 post-operative days excluding the first 24 h after surgery was recorded. Other post-operative morbidities such as hemorrhage, urinary tract infection, vaginal vault infection, paralytic ileus, and chest infection were noted. The duration of hospital stay was counted from the morning of the day of operation to the day of discharge. Vault was examined at discharge. The criteria for discharging the patient were afebrile, normal micturition, normal bowel movements, and no vault infection. Patients were asked to come after 6 weeks to outpatient department for follow-up. They were questioned regarding any discomfort as the result of surgery. Menstrual problems, backache, and psychological problems were asked for if any. Patients were examined for stress urinary incontinence (SUI), vaginal discharge, vault granulation, etc.

Patients were called through letters and phone calls at 6 months and 1 year for follow-up. They were questioned regarding any discomfort such as menstrual abnormalities, dyspareunia, and psychological problems following surgery and they were examined to look for any recurrence of prolapse, stress incontinence, vaginal discharge, vault granulation, etc. The data were entered in a pro forma for analysis later. The statistical method used to express the rate of complications was in percentage, standard deviation was used to express various parameters in terms of range and test of significance was used in appropriate places to know the factors influencing these.

RESULTS

The average age of patients who underwent Ward Mayo's operation is 47 years and for those who underwent

Manchester repair was 31.6 years. Nearly 54% of patients who underwent Ward Mayo's were between 41 and 50 years of age. Manchester repair was done in younger age groups and nearly 90% were between 31 and 35 years. The mean parity was 3 ± 1 among women who underwent Ward Mayo. Nearly 25% of patients had either parity 5 or more. Among patients who underwent Manchester repair two were nulliparous, ten was unmarried, and one other was a widow.

Demographic characteristics among patients who underwent Ward Mayo and Manchester		
Patient characteristics	Ward Mayo n (%)	Manchester n (%)
Age (years)		
30	-	1 (10)
31-40	15 (13.51)	9 (90)
41-50	61 (54.95)	-
51-60	35 (31.53)	-
Mean age	47.52 \pm 5.2	31.1 \pm 3.6
Parity (mean)	3.5 \pm 1.4	1.8 \pm 0.8
Hemoglobin (mean g%)	10.5	10.4

Mean Hb for all patients undergoing vaginal surgeries for genital prolapse was 10.92 g%. In our study, there were five hypertensive patients. One patient had bronchiectasis; she was tested for pulmonary function and taken up for surgery. Over 91% of patients were given spinal anesthesia. General anesthesia was used in patients with heart disease where hypotension caused by SA would be dangerous and in some with technical difficulty. Conversion from spinal to general anesthesia was done in four patients. The mean time for performing Ward Mayo was 50.40 ± 16.2 and for Manchester was 46.50 ± 13.2 .

The mean time taken for vaginal hysterectomy (VH) and anterior colporrhaphy (AC) was 46.84 ± 26 min while blood loss was 248.73 ± 117 ml as shown in Table 1. When anterior and posterior repairs were combined with VH, the mean time taken was more (59.06 ± 17 min) and mean blood loss was 339.06 ± 138 ml both of which were statistically significant. Hence, it is evident that VH+AC+ pelvic floor repair (PFR) required more time and had more blood loss. Additional procedures were done in 9.09% of patients. The mean time taken for these procedures was 53.63 ± 14 min and the blood loss was 300 ± 128 ml, there was no increase in either time or blood loss when these procedures were done in addition.

The mean time taken by senior residents to perform the surgeries was 53.62 ± 14.8 min and that by consultants was 45.29 ± 14 min. There was significant decrease in operating time ($P=0.002$) when done by consultants. The blood loss was 248.08 ± 120 ml for procedures done by consultants and 290.65 ± 131 ml when performed by senior residents. There

Table 1: Types of surgery and its relation to blood loss

Type of surgery	No of participants n=121 (%)	Mean time (min)	Mean blood loss (ml)
Ward Mayo	111 (91.7)	50.40 \pm 16.2	275.22 \pm 130
Manchester	10 (8.2)	46.50 \pm 13.2	245.5 \pm 115
VH+AC	77 (69.36)	46.84 \pm 12.6	248.73 \pm 117
VH+AC+PR	34 (30.63)	59.06 \pm 17.6	339.06 \pm 138
Kelly's repair	7 (5.78)	48.57 \pm 17.6	285 \pm 110
CPT repair	1 (0.82)	75 \pm 7.3	300 \pm 130
Incisional hernia repair	1 (0.82)	50 \pm 5.6	150 \pm 30
Salpingo-oophorectomy	2 (1.65)	62.5 \pm 6.2	425 \pm 180

VH: Vaginal hysterectomy, AC: Anterior colporrhaphy, PR: Posterior repair

was a decrease in blood loss when done by consultants though it was not statistically significant ($P=0.070$).

The mean blood loss in case of vaginal surgeries for prolapse was 260.36 ml. Blood transfusion was required in 5.78% of cases and the mean blood loss requiring transfusion was 578.54 ml. All seven cases of surgeries requiring blood transfusion were for Ward Mayo's operation. Four out of 77 patients (5.1%) who underwent VH plus AC and three out of 34 patients (8.82%) who underwent anterior and posterior repair with VH needed blood transfusions. In two cases, there was difficulty in achieving hemostasis for which blood transfusion was given. In one case, there was bleeding from the right ovary and hence right Salpingo-oophorectomy was done and it required transfusion.

Of the total cases with adhesions three cases had previous laparotomy. Difficulty was encountered in opening UV told of peritoneum in three cases. There was difficulty in achieving hemostasis in three cases which was due to slipping of uterine pedicles in one case, and in the other two cases there was difficulty in securing hemostasis at the bladder base. Blood transfusion was required in 5.7% of patients. Bladder injury occurred in two cases which accounts for 1.65%. No other injuries like that of bowel or ureters occurred during the period of study as shown in Table 2. Of the immediate post-operative complications, there were three cases of reactionary hemorrhage which amounted to 2.47%. One patient had oozing from the vaginal vault. In second case, there was generalized ooze from vault third patient had increasing pallor and vaginal bleeding in the immediate post-operative period, laparotomy was done and bleeder in the right infundibulo pelvic ligament ligated.

Three patients suffered from febrile episodes of which one patient had reactionary hemorrhage and underwent vaginal packing for 48 h. All patients were treated with

therapeutic antibiotics. One patient had infection of vault. She was treated with therapeutic antibiotics (doxycycline and metronidazole). Therapeutic antibiotics were continued in 13 patients (10.74%). These consisted of five diabetic patients and two patients with heart disease. The rest six were those with urinary tract and operative site infection. Mean duration of hospitalization was 5.33 days. Hospitalization was prolonged in cases with bladder injury up to 14 days and in patients with urinary tract infection and febrile morbidity for which therapeutic antibiotics were continued for 7 days. The mean duration of hospitalization in Kelly's repair was 7 days.

The most common complication noted in patients who underwent vaginal procedures for prolapse was backache (4.95%) and next to it was psychological problems (4.13%), such as vague epigastric pain, pain over lower limbs, and generalized myalgia as shown in Table 3. Three patients had vaginal discharge and were treated with a course of antibiotics. There was menstrual problem in one patient who underwent Manchester repair. There was no case of dyspareunia as they were advised abstinence for 6 weeks. No patient with Kelly's repair had recurrent SUI. Among the complications after 6 months, psychological disturbances were noted in 8 patients (6.61%). This was due to the fact that the patients attributed all their physical ailments to the surgery. Backache was noted in 5 patients (4.13%). SUI was noted in 2 patients who underwent Kelly's repair. Two patients had vaginal discharge, two gave history of dyspareunia, and two had vault granulation. Many patients

had non-specific symptoms such as nausea, indigestion, myalgia, and giddiness.

DISCUSSION

In our study, the mean time taken for Manchester repair was 46.50 min and mean blood loss was 245.50 ml, Ayhan et al. studied the post-operative complications among women who underwent Manchester repair. The mean operating time was 71.43 ± 17.55 min and the mean blood loss was 185.18 ± 174.44 ml. Our study showed that in Manchester repair, the time taken was 45.50 min and the mean blood loss was 245 ml. There was no blood transfusion given to patients who underwent Manchester repair. Leventhal and Lazarus reported a series of 300 vaginal hysterectomies (with and without PFR) in which transfusion rate was 14%. Hawksworth and Roux at Oxford Hospitals reported a series of 1000 consecutive vaginal hysterectomies in which no blood was given during the procedure and only 16 patients required subsequent blood transfusion. By contrast Taylor et al. noted that in 163 cases performed at Colorado Hospitals, 88 required blood transfusions. The higher incidence of blood transfusion was partly due to the tendency for blood loss when PFR was carried along with hysterectomy. Inadequate treatment of the patient's anemia or because surgery was not denied until the anemia was corrected was the reasons for transfusions in 15% of patients.³⁻⁵

Injuries to adjacent organs during hysterectomy are not uncommon complications involving primarily the bladder, bowel, and ureter. Bladder injury is more common during AC. It can be discovered intraoperatively by direct visualization and also by aid of cystoscopy with the administration of indigo carmine. Bladder injuries should be closed in two layers with absorbable sutures. Post-operative hemorrhage is any post-operative bleeding event that requires transfusion. The majority of such cases required re-suturing of the vaginal cuff or vascular pedicles.

There were four cases (3.30%) of urinary retention following vaginal surgeries for genital prolapse. All were patients who underwent AC. There was no SUI demonstrated preoperatively. The average number of days of bladder drainage was 5 days and therapeutic antibiotics were used in these patients. Over elevation of bladder neck by tight sutures is one of the factors responsible for urinary retention. In the study by Ayhan et al., among 204 women who underwent Manchester repair, 45 patients (22.05%) developed urinary retention postoperatively, of whom 20 (9.8%) required 25 mg/day of bethanachol chloride for 1 week. Ottesen et al. found 12.2% urinary retention rate among women who underwent vaginal surgery for uterovaginal prolapse.⁶⁻⁹

Table 2: Intra-operative and post-operative complications

Complications	Frequency n=121
Intra-operative	
Hemorrhage	7 (5.78%)
Bladder injury	2 (1.65%)
Post-operative	
Reactionary Hemorrhage	3 (2.47)
UTI	4 (3.30)
Febrile morbidity	8 (6.61)
Vault infection	1 (0.82)

UTI: Urinary tract infection

Table 3: Long-term complications

Follow-up complications	6 weeks n (%)	6 months n (%)	1 year n (%)
Backache	6 (4.95)	5 (4.13)	5 (4.13)
Psychological	5 (4.13)	8 (6.61)	8 (6.61)
Stress	-	2 (1.65)	2 (1.65)
Incontinence			
Vault granulation	-	2 (1.65)	2 (1.65)
Vaginal discharge	3 (2.47)	2 (1.65)	2 (1.65)
Dyspareunia	-	2 (1.65)	2 (1.65)
Menstrual problems	1 (0.82)	-	-

Reported rates of urinary tract infections are higher when routine cultures are taken from the Foley catheter before discontinuation. There undoubtedly are instances of culture positive infections that clear spontaneously with removal of Foley catheter. The rate of urinary tract infections also has decreased with time with the increasing use of prophylactic antibiotics. Bartzen, in a large uncontrolled series, did find a diminished rate of urinary tract infection with prompt catheter removal in the post-operative period.⁵ Summit, in a smaller controlled study, found a slightly lower incidence of urinary tract infection, but the decrease was not statistically significant. Harms et al. support the trend toward diminished duration or elimination of post-operative catheterization. In our study, the rate of urinary tract infection was low (3.3%) which may be due to prompt removal of catheter post operatively in <24 h in majority of cases. Seven patients suffered from febrile episodes. The incidence of febrile morbidity is less in our study in comparison to others. It is because of the usage of prophylactic antibiotics in the patients. In three cases, the cause of fever was unexplained and in four cases it was due to urinary tract infection. In our study, there was only one case of vaginal cuff infection.^{10,11} The patient suffered from high spikes of fever for which she was treated with a course of therapeutic antibiotics. Duration of hospital stay was 10 days. According to CREST study, the rate of pelvic infection after VH was 3.9%.

In our study, perioperative antibiotics were used routinely but therapeutic antibiotics were given in cases of any intra-operative complications encountered such as bladder injury or hemorrhage. It was also given in cases of immediate post-operative complications such as febrile episodes, urinary tract infection, and vaginal cuff infection. All patients with diabetes mellitus and heart disease received therapeutic antibiotics. The mean hospital stay was 5.33 days; in our study, it was prolonged in patients with bladder injury, urinary tract infection, febrile morbidity, and operative site infection. It ranged from 7 to 14 days. In Kelly's repair, the mean duration was 7 days. SUI occurs as a part of the clinical condition of prolapse associated with intrinsic sphincter deficiency, urethral hypermobility and lack of urethral support. Patients with cystocele can experience urinary incontinence secondary to detrusor instability which may or may not be related to cystocele itself. In our study, there were seven cases of SUI and all of them underwent Kelly's repair (5.78%). The Kelly's plication was originally described as an anti-incontinence procedure where the pubocervical fascia at the bladder neck is plicated to reduce the diameter of the urethra at the site of funnelling.¹²⁻¹⁶

Two patients among the Kelly's repair group developed recurrent SUI during the follow up period. In a study by

Pelusi et al., among 264 patients with genital prolapse, 104 had SUI and underwent VH with anterior vaginal repair and Kelly's plication. Follow-up demonstrated the effectiveness of this procedure, with a success rate of 88.5% over 8–12 years. In a study by Chawla et al., modified MMK operation was compared to Kelly's plication for SUI and the result was that Kelly's repair had a cure rate of 69% while it was 90.1% with modified MMK. Still they suggest continuing the less complex Kelly's plication combined with VH with PFR for the patients with moderate stress incontinence and associated pelvic floor relaxation. In our study, dyspareunia was not reported by the end of 6 weeks as the patients were advised abstinence for that period. It was 1.65% after 6 months and 1 year because of older age many of our patients may not be having coitus unlike in the western world.¹⁷

In our study, psychological complications were encountered in 4.13%, 6.61%, and 6.61% of patients after 6 weeks, 6 months, and 1 year, respectively. These include symptoms such as anxiety, depression, myalgia, indigestion, and loss of appetite. Hysterectomy could result in post-operative psychiatric morbidity, based on a number of retrospective reports of high rates of depression, psychiatric referrals, and psychiatric hospitalization in women undergoing hysterectomy. A recent prospective cohort study used a non-clinical population based sample to assess the effects of hysterectomy on psychological functioning using psychological state before knowing the indication of a need for hysterectomy as a baseline. This study reported no higher levels of depressive symptoms, stress, or psychological symptoms in women undergoing hysterectomy. In fact women who had a hysterectomy experienced less stress and more optimistic attitude than the control women. One possible explanation for this finding may be that, in the past, patients reporting emotional symptoms preferentially were referred for hysterectomy. In some patients loss of menstrual function may result in psychiatric problem. One of the patients who underwent Manchester repair had cervical stenosis in our study. Dilatation and drainage was done. In retrospective observational study among women who had Manchester repair, Ayhan et al. reported that cervical stenosis occurred in 11.27% of patients. Over dilatation of cervix during the procedure may avoid this complication to a great extent.¹⁸⁻²⁴

In our study, most of the patients had minimal bowel disturbances Harris in his review article on complications of hysterectomy states that hysterectomy could affect bladder and bowel function if intraoperative traction, re-alignment of pelvic organs after surgery, or other effects impaired autonomic enervation in the pelvic floor.²⁵⁻²⁹ Some support for this hypothesis was provided by a case-control study that reported a tendency to constipation

in women hysterectomy, often associated with increased urinary frequency. A prospective study designed to determine the incidence of symptoms suggestive of irritable bowel syndrome arising after hysterectomy and the effect of surgery on pre-existing gastrointestinal symptoms found less marked changes in women with irritable bowel syndrome before hysterectomy. 60% improved after surgery, and 20% were worse. New problems like constipation arose in 5% of cases.^{30,31} This finding is consistent with results of other studies. Among seven prospective studies of bladder function and urinary symptom after hysterectomy, less than half have shown some negative effect on bladder function. The patterns of impaired bladder function are inconsistent among those studies; however, only one showed any subjective decline. In summary, the existing evidence suggests that hysterectomy rarely has any clinically significant adverse effect on bladder and bowel function.

Limitations of the study

The study had some limitations like it did not take into account of the individual variability of surgeons as a factor that could affect the frequency and severity of complications. The patient selection criteria was not clearly mentioned.

CONCLUSION

It is concluded from the study that vaginal surgeries for genital prolapse have lesser complications both intra-operatively and during the post-operative period. The patient's characteristics such as age, parity, other illnesses, and surgical details such as choice of the operation, experience of the surgeon, additional procedures performed, blood loss, and antibiotic usage influence the morbidities associated with the surgery. Although the sample size is small, the long-term (1 year) follow-up in our study shows satisfactory results.

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REFERENCES

- Lukacz ES, Santiago-Lastra Y, Albo ME and Brubaker L. Urinary incontinence in women: A review. *JAMA*. 2017;318(16):1592-1604. <https://doi.org/10.1001/jama.2017.12137>
- Lee SH, Oh SR, Cho YJ, Han M, Park JW, Kim SJ, et al. Comparison of vaginal hysterectomy and laparoscopic hysterectomy: A systematic review and meta-analysis. *BMC Womens Health*. 2019;19(1):83. <https://doi.org/10.1186/s12905-019-0784-4>
- Alkış I, Karaman E, Han A, Gülaç B and Ark HC. The outcome of Manchester-Fothergill operation for uterine decensus repair: A single center experience. *Arch Gynecol Obstet*. 2014;290(2):309-14. <https://doi.org/10.1007/s00404-014-3200-1>
- McPherson K, Herbert A, Judge A, Clarke A, Bridgman S, Maresh M and Overton C. Psychosocial health 5 years after hysterectomy: population-based comparison with endometrial ablation for dysfunctional uterine bleeding. *Health Expect*. 2005;8(3):234-243. <https://doi.org/10.1111/j.1369-7625.2005.00338.x>
- Abdel-Aleem H, Aboelnasr MF, Jayousi TM and Habib FA. Indwelling bladder catheterisation as part of intraoperative and postoperative care for caesarean section. *Cochrane Database Syst Rev*. 2014;4:CD010322. <https://doi.org/10.1002/14651858.cd010322.pub2>
- Benrubi GI. History of hysterectomy. *J Fla Med Assoc*. 1988;75:533-534.
- van den Akker T, Brobbel C, Dekkers OM and Bloemenkamp KW. Prevalence, indications, risk indicators, and outcomes of emergency peripartum hysterectomy worldwide: A systematic review and meta-analysis. *Obstet Gynecol*. 2016;128(6):1281-1294. <https://doi.org/10.1097/aog.0000000000001736>
- Wu JM. Stress incontinence in women. *N Engl J Med*. 2021;384(25):2428-2436.
- Erdoğan E, Demir S, Çalışkan BB and Bayrak NG. Effect of psychological care given to the women who underwent hysterectomy before and after the surgery on depressive symptoms, anxiety and the body image levels. *J Obstet Gynaecol*. 2020;40(7):981-987. <https://doi.org/10.1080/01443615.2019.1678574>
- DeLancey JO. Anatomic aspects of vaginal eversion after hysterectomy. *Am J Obstet Gynecol*. 1992;168:1717-1724.
- Brincat CA, Larson KA and Fenner DE. Anterior vaginal wall prolapse: Assessment and treatment. *Clin Obstet Gynecol*. 2010;53(1):51-58. <https://doi.org/10.1097/grf.0b013e3181cf2c5f>
- Ramdhan RC, Loukas M and Tubbs RS. Anatomical complications of hysterectomy: A review. *Clin Anat*. 2017;30(7):946-952. <https://doi.org/10.1002/ca.22962>
- Scott JR, Liu D and Mathes DW. Patient-reported outcomes and sexual function in vaginal reconstruction: A 17-year review, survey, and review of the literature. *Ann Plast Surg*. 2010;64(3):311-314. <https://doi.org/10.1097/sap.0b013e3181af8fca>
- Iglesia CB and Smithling KR. Pelvic organ prolapse. *Am Fam Physician*. 2017;96(3):179-185.
- Raju R and Linder BJ. Evaluation and management of pelvic organ prolapse. *Mayo Clin Proc*. 2021;96(12):3122-3129. <https://doi.org/10.1016/j.mayocp.2021.09.005>
- Maher C, Feiner B, Baessler K and Schmid C. Surgical management of pelvic organ prolapse in women. *Cochrane Database Syst Rev*. 2013;4:CD004014. <https://doi.org/10.1002/14651858.cd004014.pub5>
- Barber MD. Pelvic organ prolapse. *BMJ*. 2016;354:i3853.
- Machin SE and Mukhopadhyay S. Pelvic organ prolapse: Review of the aetiology, presentation, diagnosis and management. *Menopause Int*. 2011;17(4):132-136. <https://doi.org/10.1258/mi.2011.011108>

19. Leng J, Lang J, Huang R, Liu Z and Sun D. Complications in laparoscopic gynecologic surgery. *Chin Med Sci J*. 2000;15(4):222-226.
20. Sandberg EM, Twijnstra AR, Driessen SR and Jansen FW. Total laparoscopic hysterectomy versus vaginal hysterectomy: A systematic review and meta-analysis. *J Minim Invasive Gynecol*. 2017;24(2):206-217.
<https://doi.org/10.1016/j.jmig.2016.10.020>
21. Engel O, Rink M and Fisch M. Management of iatrogenic ureteral injury and techniques for ureteral reconstruction. *Curr Opin Urol*. 2015;25(4):331-335.
<https://doi.org/10.1097/mou.0000000000000175>
22. Lin LL, Ho MH, Haessler AL, Betson LH, Alinsod RM, Liu CY, et al. A review of laparoscopic uterine suspension procedures for uterine preservation. *Curr Opin Obstet Gynecol*. 2005;17(5):541-546.
<https://doi.org/10.1097/01.gco.0000179664.83154.9c>
23. Allam IS, Makled AK, Gomaa IA, El Bishry GM, Bayoumy HA and Ali DF. Total laparoscopic hysterectomy, vaginal hysterectomy and total abdominal hysterectomy using electrosurgical bipolar vessel sealing technique: A randomized controlled trial. *Arch Gynecol Obstet*. 2015;291(6):1341-1345.
<https://doi.org/10.1007/s00404-014-3571-3>
24. Dallas KB, Rogo-Gupta L and Elliott CS. Urologic injury and fistula after hysterectomy for benign indications. *Obstet Gynecol*. 2019;134(2):241-249.
<https://doi.org/10.1097/aog.0000000000003353>
25. Clarke-Pearson DL and Geller EJ. Complications of hysterectomy. *Obstet Gynecol*. 2013;121(3):654-673.
<https://doi.org/10.1097/aog.0b013e3182841594>
26. Yazdany T and Bhatia N. Uterosacral ligament vaginal vault suspension: Anatomy, outcome and surgical considerations. *Curr Opin Obstet Gynecol*. 2008;20(5):484-488.
<https://doi.org/10.1097/gco.0b013e32830eb8c6>
27. Tahaoglu AE, Balsak D, Togrul C, Obut M, Tosun O, Cavus Y, et al. Emergency peripartum hysterectomy: Our experience. *Ir J Med Sci*. 2016;185(4):833-838.
<https://doi.org/10.1007/s11845-015-1376-4>
28. Maher C, Baessler K, Glazener CM, Adams EJ and Hagen S. Surgical management of pelvic organ prolapse in women: A short version Cochrane review. *NeuroUrol Urodyn*. 2008;27(1):3-12.
<https://doi.org/10.1002/nau.20542>
29. Kiran A, Hilton P and Cromwell DA. The risk of ureteric injury associated with hysterectomy: A 10-year retrospective cohort study. *BJOG*. 2016;123(7):1184-1191.
<https://doi.org/10.1111/1471-0528.13576>
30. Ghanaie MM, Asgari SA, Haghbin A, Mehdizade F and Ghalebini SM. Post-hysterectomy transient hydronephrosis: A prospective study. *J Family Reprod Health*. 2021;15(1):13-18.
<https://doi.org/10.18502/jfrh.v15i1.6068>
31. Gao JS, Leng JH, Liu ZF, Shen K and Lang JH. Ureteral injury during gynecological laparoscopic surgeries: Report of twelve cases. *Chin Med Sci J*. 2007;22(1):13-16.

Authors Contribution:

JRL - Concept and design of the study, prepared first draft of manuscript; Interpreted the results; **KS** - Reviewed the literature and manuscript preparation; **AM** - Coordination, statistical analysis and interpretation, preparation of manuscript and revision of the manuscript.

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