



Research Article

VAGINAL VAULT PROLAPSE: A HOSPITAL BASED STUDY FROM NORTHERN INDIA

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ABSTRACT

Objective: The purpose of this study is to evaluate the efficacy, safety, cost effectiveness of available surgical methods to correct the protrusion of vaginal stump following hysterectomy and to suggest a suitable technique offering the best benefit to the patient of this region.

Materials and Methods: 30 patients were admitted in this hospital with the symptoms and clinical sign of prolapse of vaginal vault. They were evaluated and subsequently surgical correction was offered. The patients were followed up with questionnaires of quality of life index regarding their urinary, anorectal and coital problem and the recurrence of the problem.

Setting: Pandit Jawaharlal Nehru Government Medical College, Chamba, Himachal Pradesh, admitted for prolapse of vaginal vault in the department of Obstetrics and Gynaecology.

Results: 4 different types of corrective surgery were performed on 30 patients admitted for this study. The posterior suspension with sacrum was the technique with less rate of recurrence and minimal dyspareunia. The anterior suspension was easier to perform and vaginal sacrospinous suspension offers better compliance in terms of cost effectiveness and early return to the daily activity, disadvantage being it took longer time to resume coital function.

Conclusion: Vaginal sacrospinous suspension helps the patient to resume her daily work earlier although it is easier to perform anterior suspension using prolene mesh.

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INTRODUCTION

Vault prolapse is referred to as the descent of the vaginal cuff below a point that is 2cm less than the total vaginal length, above the plane of hymen. [1]

This condition is shown to follow 11.6 %of hysterectomy performed through vaginal route and 1.8 % of those performed abdominally for other indication[2] The incidence of vault prolapse appeared to be increased five fold after vaginal hysterectomy [3]

Co existent pelvic floor defect like cystocele, rectocele or enterocele are present in 72 % patients with vault prolapse [4]

A clear understanding of the supportive mechanism for the uterus and the vagina is important in order to make the right choice of corrective procedure and also to minimise the risk of post hysterectomy occurrence of vault prolapse. The cardinal and uterosacral ligaments form a complex of visceral supporting tissue to the upper vagina and cervix and hysterectomised vaginal cuff.

Clinically detachment of the cardinal - uterosacral ligament complexes from pericervical ring occurs at the level of the ischial spine and provide the anatomical rationale for the development of post hysterectomy vaginal vault prolapse and enterocele (apical prolapse) [5]

The satisfactory correction of vaginal vault prolapse is a considerable surgical challenge and it lies between the vaginal and the abdominal approach. The choice of procedure should be based on age, nature of previous surgery, co morbidity and the level of physical and sexual activity. The aim of prolapse surgery is to restore normal vaginal capacity and coital function [6]

The objective of this study is to evaluate the efficacy, safety, cost effectiveness of 4 surgical methods to correct the protrusion of vaginal stump and to suggest a suitable technique offering the best benefit to the patient of this region.

MATERIALS AND METHOD

Between September 2017 to July 2018, 30 cases of vaginal vault prolapsed were registered in the department of obstetrics and gynaecology, Pt Jawaharlal Nehru Government Medical

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College Chamba Himachal Pradesh. They had undergone vaginal hysterectomy for the correction of genital prolapse and other co-existent pelvic floor defect and abdominal hysterectomy for non-prolapsed condition. The mean time elapsed from the primary surgery was 29 months, the shortest being 6 months and the longest being 60 months. The lowest age that has been included in this study was 42 and the highest age that has presented was 72. The variable of the four groups: amount of blood loss, complication rates, post-operative morbidity, length of the hospital stay, cost effectiveness and recurrence rate of each procedure was analysed statistically.

Based on the quality of life, presenting history and complaint and clinical examination a questionnaire format was filled up for each patient.

Prior to taking up the patient for surgery, a careful history comprising of chronic cough and chronic constipation and nutritional status were addressed and were taken care of. These patients were divided in four groups Group A were performed posterior sacral suspension, Group B were done anterior rectus sheath suspension, Group C were offered vaginal sacrospinous colpopexy and Group D were given uterosacral suspension.

Box 1 Definitions and Procedures used in this study

Posterior sus pension: Vaginal vault is suspended from 3rd piece of sacral vertebra. Yates described it in 1975 pointing out that vagina is less likely to be prolapsed through the hiatus urogenitalis if its axis is more horizontal direction.[7]

Anterior suspension: Vaginal vault is suspended from the rectus sheath of the anterior abdominal wall. Beecham and Beecham 1973 described this favoring the construction of a sub-peritoneal tunnel under the peritoneum over the upper surface of the bladder so that the strip of the fascia may support the vaginal vault from the posterior aspect of the anterior abdominal wall. This use of fascia is largely replaced by prolene mesh of 10 cm in length and 15 mm in width or mersilene tape.[8]

Utero sacral suspension: vaginal vault is suspended from approximated uterosacral ligament from both sides along with obliteration of the cul de sac. This was described as Mc call's culdoplasty [9]. Co-existent defect in the anterior wall (cystocele) or rectocele was also repaired.

Sacrospinous suspension: vaginal vault is suspended from sacrospinous ligament connecting lateral wall of the sacrum to the tip of the ischial spine in the lateral wall of the pelvis. The procedure was first described by Miyazaki [10] in 1987 and later popularised by Sharp and Richer [11, 12] and by Erata *et al.* and Lang *et al.* [13]. It was originally described as a bilateral procedure but subsequently being done as a unilateral Procedure.

Cystocele: anterior compartment defect: Herniation of urinary bladder anterior wall of the vagina

Enterocoele: Apical compartment defect: Herniation of bowel from the postero superior compartment

Rectocele: posterior compartment defect: Herniation of rectum from posterior compartment through the defect of the recto vaginal fascia.

Outcome measures included a questionnaire for urinary, bowel and sexual symptoms and detailed vaginal and clinical examination were performed for the recurrence of this problem. These patients were followed up every 3 months up to 24 months and their new complaint related to these problems were also noted.

Box 2 Questionnaires: Quality of life Index

Clinical examination	Urinary symptoms	Anorectal symptoms	Coital dysfunction
Cystocele			
Apical prolapse with descent of the vault	Hesitancy	Difficulty in initiating defaecation	Active sexual life
Rectocele	Urgency	Need for digitalization	Comfortable
Enterocoele	Incontinence		Uncomfortable
	Retention		painful

RESULTS

There are 30 patients included in the study over 12 months. Out of 30 subjects, 20 patients underwent abdominal procedure and 10 subjects underwent vaginal procedure. Out of 20 abdominal procedure, 10 patients underwent posterior suspension and 10 patients underwent anterior suspension. Out of 10 vaginal procedures, 5 patients underwent suspension from the uterosacral ligament and 5 patients underwent suspension of vaginal vault from sacrospinous ligament.

Group A: 10 consecutive patients with vaginal vault prolapsed were treated with abdominal sacral colpopexy (posterior suspension)

Group B: 10 patients with vaginal vault prolapse treated with abdominal suspension from anterior rectus sheath (Anterior suspension)

Group C: 5 patients with vault prolapse were treated with suspension from the sacrospinous ligament.

Group D: 5 patients with vault prolapse treated with suspension from uterosacral ligament.

Group A & B were done through abdominal route and Group C & D were done through vaginal route.

All results were compared using a table described in the table section (Refer to table no 13 and 14). The parameters were amount of blood loss, length of hospital stay and analysis of morbidity and successful outcome.

Table 1 Age distribution

Age group	Total no	Cumulative Percentage
40 - 50	04	13.3 13.3
50- 60	08	26.7 40.0
60-70	12	40 80
70- 80	06	20 100

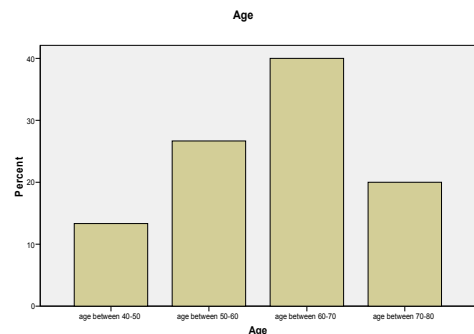


Table 2 distribution of parity

parity	Total no	Cumulative percentage
Less than 2	0	53.3 53.3
Between 2 - 4	18	53.3 86.7
Between 5 - 8	12	13.3 100
More than 8	0	---- ----

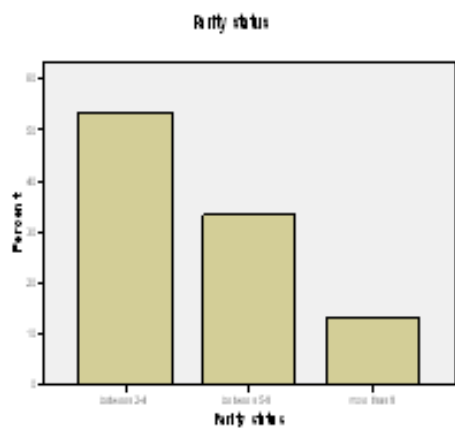


Table 3 distribution of marital status and sexual life

Sexual status	Total no	Cumulative Percentage
Active sexual life with partner	12	40
Not so active	12	80
Partner demised	06	100

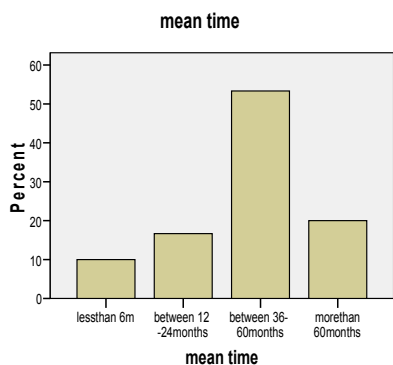


Table 4 distribution of menstrual status when last operated

Menstrual status	Total no	Cumulative Percentage
surgical menopause induced after hysterectomy	04	13.3
post menopausal during last surgery	26	86.7

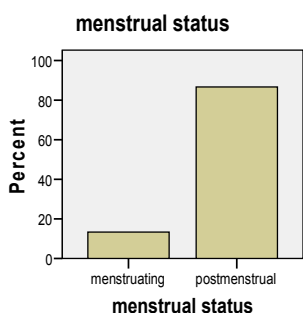


Table 5 distribution of socio economic status

Socioeconomic status	Total no	Percentage
Poverty with no earning member	5	17.9
Middle class	20	64.3
Affluence with good earning	5	17.9

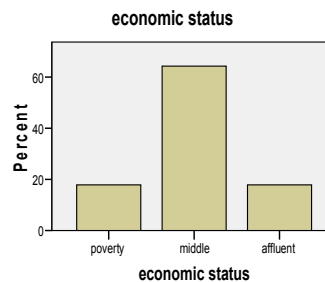


Table 6 comparative study of previous delivery

Previous mode of delivery	Total no.	percentage
Only Vaginal delivery	25	83.3
Combined vaginal and surgical delivery	5	16.7
Only surgical delivery	0	-----

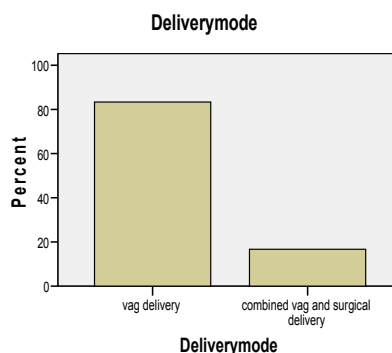


Table 7 Types of surgery done previously

Type of surgery	Total no.	percentage
Vaginal hysterectomy in camp set up	23	76.7
Vaginal hysterectomy in normal surgical setup	5	16.7
Abdominal hysterectomy for non prolapse condition	2	6.7

Table 8 mean time elapsed since last surgery

Development of prolapse since last hysterectomy	Total no.	percentage
Less than 6 months	3	10.0
Between 12-24months	5	16.7
Between 36-48months	15	53.3
48-60 months	7	20.0

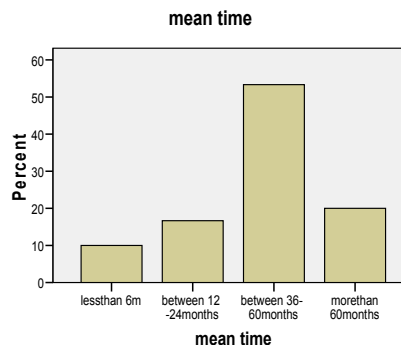


Table 9 Clinical presentation or quality of life

Clinical presentation	No of cases	Cumulative percentage
Urological problem	20	This problem co-existed in one subject so percentage not possible.
Anorectal problem	20	
Difficulty in walking	25	
Difficulty in sexual life	25	
Ulceration in the vaginal mucosa	05	

Table 10 Radiological findings

Radiological findings	No of cases	Cumulative percentage
No abnormal findings	20	33.3
Thickened bladder	15	33.3
Mild hydroureter	5	16.7
Mild hydronephrosis	5	16.7
Moderate change in urological system	00	-----

GROUP B

Table 11 Types of corrective surgery done

Type of surgery	No cases	percentage
Vault fixation in posterior wall with sacrum	10	33.3
Vault fixation with anterior wall rectus sheath	10	33.3
Vault fixation with lateral wall with sacrospinous ligament	05	16.7
Vault fixation with utero sacral ligament with anterior and posterior colpoperineorrhaphy	05	16.7
		100.0

Table 12 Per operative findings

Preoperative finding	Total no	percentage
Omental adhesion with vault	10	This finding co-existed in one subject so percentage not possible.
Anterior Vault Adhesion with bladder	10	
Posterior vault adhesion with rectum	05	percentage not possible.
Clear pelvis without adhesion	15	
enterocele	5	



Figure 1 preoperative demonstration of vault prolapse



Figure 2 fixation of prolene mess with vault



Figure 3 peritoneal tunnel



Figure 4 fixing under the rectus sheath

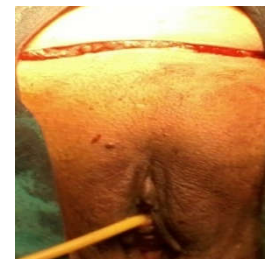


Figure 5 immediate post operative



Figure 6 post operative after 3 month

Intra Operative Events

Table 13 A Comparison of surgical technique

Type of operation	Mean operating time (in minutes)	Amount of blood loss In ml	Bowel injury	Bladder/ureteric injury	Materials required
Posterior suspension	107.1±13.06	196±14.29	nil	nil	Prolene mesh
Anterior suspension	90±7.54	100.5±14.42	nil	nil	Prolene mesh
Uterosacral suspension	73±11.51	64.0±11.40	nil	nil	Prolene surure No 1
Sacrospinous suspension	83±12.04	108.0±19.23	nil	Nil	Prolene suture No 1

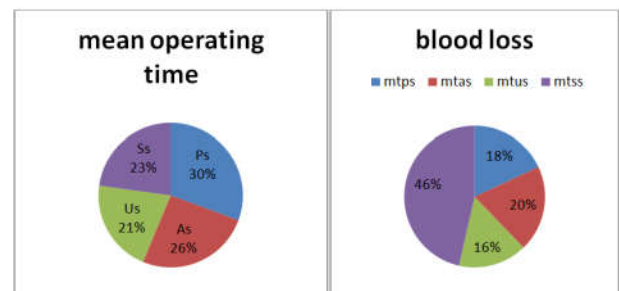


Table 13 B Post Operative Events

Type of operation	Time of ambulation (hrs)	Bowel opening time/narcotics used	Analgesic used	Superficial infection	Deep infection	Time of drainage hours	Other morbidity	Length of hospital stay
Posterior suspension (PS)	24	48	150 mg /d * 2d	4	nil	72	Ileus 1case	8 days
Anterior suspension (AS)	24	24	150mg/d*3d	2	nil	24	nil	7 days
Utero sacral suspension (US)	24	24	150mg/d*2d	nil	nil	nil	nil	3 days
Sacrospinous suspension (SS)	24	24	150mg/d*3d	nil	nil	24	nil	5days

RESULTS

Group A

The mean operating time in this group was 110 minutes with average blood loss was 200 ml. The prolene mesh was used for suspension of vagina from the 3rd sacral vertebrae. There was no peri operative morbidity. All patients ambulated after 24 hours of surgery and the average bowel opening time was between 36 -48 hours. Narcotic analgesic (Tramadol) was used 150 mg per day in divided doses for 2 days .The abdominal drain was kept for 3 days till it was dry .One patient in this group developed ileus on 5th post operative day.

Table 14 Post Operative complications

Complication	Anterior suspension	Posterior suspension	Sacrospinous suspension
fever	04	04	01
Secondary hemorrhage/additional transfusion	nil	nil	nil
Haemoperitoneum	nil	nil	nil
Abdominal distension	nil	01	nil
Difficulty in initiating bowel movement	nil	nil	01
Ileus o r intestinal obstruction	nil	01	nil
Difficulty in initiating urination after catheter removal	1 case	01	nil
Urinary obstruction	nil	nil	nil
Infection: urinary tract	nil	nil	nil
Infection : skin /serous discharge	01	02	
Pelvic cellulits/ abscess	nil	nil	nil
thrombophlebitis	nil	nil	nil
thromboembolism	nil	nil	nil

Abdomen was reopened fearing intestinal obstruction. It was internal herniation at the point of fixation of the vault. The intestines developed obstruction and partial gangrene. Resection and anastomosis was performed and the vault was refixed in the anterior wall with anterior rectus sheath. The patient was discharged after 14 days. Other 2 patients developed fever in post operative phase, 1 patient developed urinary retention after catheter removal and 2 patients developed superficial skin infection with serous discharge. These 2 patients needed additional hospital stay, other wise rest of the patients were discharged on 8th post operative days . On discharge, every patient were subjected to speculum examination and shown the position of vault fixed above and no protrusion outside.

On follow up after 3months and 6 months the symptoms of vaginal protrusion, urinary incontinence, defaecation dysfunctions were not there.

Gynaecological examination revealed a mild enterocele in 1 patient and in one patient there was mild cystocele.

No re-operation were performed for this enterocele/ cystocele as the patients were symptoms free. 2 patients developed de novo constipation, for which laxatives were prescribed and needed no active treatment.

Group B: The mean operating time for this group was 90 minutes and average blood loss was 100 ml. 4 cases had omental adhesions and 3 cases had small gut adhesion on the vault. Extreme care was taken to dissect over the bladder to avoid the injury to bladder and ureter .Prolene mesh was used to suspend the vault from the anterior rectus sheath. There were no perioperative morbidity. The patient was ambulated after 24 hours of surgery and bowel opening time was in average 24 hours. Regular analgesic were used, but patient demanded more analgesics in this group. 4 patients developed post operative fever and one patient developed superficial skin infection. On speculum examination, at the time of discharge, the vault was seen pulled up.

Group C : The inclusion criteria for choosing the vaginal route was presence of either cystocele or rectocele ,so that the simultaneous repair of the defect can also be corrected. In the sacrospinous suspension group the mean operating time was 85 minutes with additional 20 minutes for levator myorrhaphy .The average blood loss was 150ml. The patients were ambulated immediately after 24 hours on average. One patient had developed fever and one had difficulty in initiating bowel movement, which was later on relieved by laxatives.

Group D: The mean time for utero sacral suspension was 75 minutes and additional 30 minutes were taken to correct any co existing defect. Bowel opened within 24 hours and there were no associated post morbidity and fever and average hospital stay was 3 to 4 days.

DISCUSSION

The study demonstrates that outcome of 4 procedures described above.

The group A patients : (abdominal sacral suspension) Follow up after 3 and 6 months showed good support of the vaginal vault , which did not come down on coughing or straining although in 2 patients mild cystocele and enterocele were demonstrated. 2 patients showed de novo constipation.Coital function were satisfactory.

This result was comparable with Virtanen H *et al* [14] (1994) in his series of 30 patients.They used lyophilizes cerebral dura mater (lyodura) as suspensary material in 81 % (n30) and Gortex (polytetrafluroethyl) in 16 percent of cases. On follow up cystocele were seen in 18 % vault prolapse, enterocele,

rectocele, and chronic perineal laceration were seen in each 15 % of patients. 22% experienced dyspareunia and 41 % had decreased sexual interest. In another series by Geomini PM *et al*[15](2001) (n40) Gortex graft were infected within 3 months of operation , in 3 patients , prolapse of vaginal vault recurred within the follow up period , in 10 patients moderate enterocele persisted.

In the group B patients (abdominal rectus sheath suspension) it was technically easier among all 4 groups. On follow up at 3rd and 6th months there was no demonstrable protrusion of vaginal vault and no urinary symptoms like, hesitancy, urgency or incontinence were complained. Coital function resumed and it was satisfactory.

This result were comparable with with the series of De Lima *et al* (16) (1987) where 9 patients were treated with rectus sheath colpopexy, no recurrence were noted, seven patients were followed up for six months to 12 years. Girao MJ *et al* (17) (1997) reported similar result of non recurrence of vault prolapse with minimal post operative complications. Raju Mohendra *et al* (18) reported similar result of non recurrence with negligible post operative complication.

In the group C sacrospinous colpopexy (vaginal approach), on 3rd month of follow up there is well supported vaginal vault seen on speculum, there were no cystocele and rectocele noted. Patients returned to normal domestic activity after 6 weeks of surgery coital function is not attempted. Subsequent follow up showed no additional complaints, no recurrence, coitus resumed but sometimes painful.

This results were comparable with the series of Argirovic *et al* (19) (2005) with 37 patients who were treated with sacrospinous ligament suspension of vaginal vault. On follow up, 3 had asymptomatic cystocele, 1 had partial prolapse after 6 months of surgery, 3 had urinary disturbances, and patients had low back pain. There was no neural injury (pudendal or sciatic nerve) or rectal injury were noted. In another series by Carey MP *et al* (20) (1994) with 40 patients, where mean follow up period was 5 months , noted 3 partial failures. other complication were formation of cystocele and one patient complained of dyspareunia . in a series of Lo Ts *et al*(21) (2005) who did repeated sacrospinous colpopexy with implanted mesh, no recurrence were noted, 2 patients developed stage 1 prolapse on anterior vaginal wall which required no further repair.

In the group D patients (utero sacral suspension), on 3rd months of follow up, showed satisfactory vault anchorage, there was not descent of vault on coughing. Either cystocele or rectocele were not demonstrable. Patients were reluctant to resume coital function but they have no urinary and rectal complaint. This results were comparable with Barber *et al* (22) (2000), where intraoperative ureteral occlusion was noted in 11 % of cases, symptomatic prolapsed developed in 10 % cases.

These last 2 groups are following up for 6th months and 12 months

The objective of this study were to assess and examine the different available method and adopt a suitable method which would be cost effective, less peri and post operative morbidity and would allow the patient to go back to her normal activity earlier. In our opinion , sacralcolpopexy (group A) offers a better outcome in terms of lower recurrence rate , better

quality of life in terms of coital function and other associated symptoms .The width of vaginal cuff remained unaltered and the axis of the vagina is restored to normal angle. However , operative complexity is more in terms of the risk of injury to the surrounding structure. The anterior suspension is an easier option from surgical point of view , although injury to bladder and ureter is possible due to unforeseen situation but post operative recovery is little late and patient required more analgesics than other group. This group showed no recurrence till first 12 months and there was no other development of additional symptoms. Vaginal sacrospinous colpopexy was most cost effective, because there was no need to use any synthetic suspensory material unlike in Group A and Group B. These group of patients had less hospital stay and were requesting to go home on 5th day. they also resumed their normal domestic activity earlier than other groups , 3 out of 5 complained of painful coitus on their first visit after 3 months , probably attributed to the shortening of the width of the cuff.

Table 15 Follow up in terms of quality of life index

Follow up criteria	Anterior suspension	Posterior suspension	Uterosacral suspension	Sacrospinous suspension
Clinical examination				
Cystocele				
Apical prolapse	nil	nil	nil	nil
Rectocele				
Enterocele				
Urinary symptoms				
Hesitancy	Retention in 1 case	nil	nil	nil
urgency				
incontinence				
retention				
Anorectal symptoms				
Difficulty in initiating defaecation	nil	nil	nil	nil
Need for digitalization before passing stool				
Active sexual life				
Comfortable	nil	nil	nil	dyspareunia
Uncomfortable painful				
Recurrence	nil	Nil	Nil	Nil

CONCLUSION

Vaginal vault prolapse is a common complication following vaginal hysterectomy with the negative impact on the quality of life due to associated urinary, anorectal and sexual dysfunction. So a clear understanding of the supportive mechanism for the uterus and vagina is important in making right choice of the corrective procedure.

Vault prolapse repair either with the use of patients own tissue or synthetic material can be carried out abdominally or vaginally. Sacrospinous fixation and abdominal sacrocolpopexy are the commonly performed procedure with literature in favour of abdominal sacropexy over sacrospinous fixation due to its reported higher success rate in terms of recurrence (Uzoma)(4). Other less commonly performed procedure include uterosacralsuspension and iliococcygeal fixation. colpocleisis will play a greater role in future as the aging population increases. Mesh procedures are gaining popularity and preliminary datas from vaginal mesh procedure is encougaing(23,24). Laparoscopic technique requires a high level of skill and experience. As aging population is increasing, the incidence of prolapse and post hysterectomy prolapsed will also increase under this situation, where we observe high incidence of vaginal vault following prolapsed

surgery we suggest the young surgeons to pick up the skill of vaginal sacro-spinous suspension which is more cost effective, helps the patients to return to her daily activity and satisfying to the effort put by the surgeon.

Abbreviations

Posterior suspension (PS) Anterior suspension (AS) Utero sacral suspension (US) Sacrospinous suspension (SS)

Competing Interest: The authors declare that there is no conflict of interests regarding the publication of this paper.

Authors Contribution

P BJ has reviewed the literature and prepared the manuscript, M R gave an important contribution in revising text and A I significantly contributed to revise the article.

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