Recurrence of Prolapse following Vaginal Hysterectomy with and without Vaginal Vault Fixation: A Retrospective Review

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ABSTRACT

Background. The rate of prolapse recurrence after vaginal hysterectomy ranges from 6% to 12%. Vaginal vault fixation procedures like the iliococcygeus fixation and the cul-de-sac obliteration (McCall culdoplasty) have been used to address the loss of apical support in patients with advanced-stage prolapse to prevent this recurrence.

Objectives. This study aims to assess the rate of prolapse recurrence and risk factors for recurrence as well as urinary, bowel, and sexual symptoms in women who have undergone vaginal hysterectomy with and without vaginal vault fixation for pelvic organ prolapse stage 2 or higher.

Methods. This study is a retrospective study that included patients with pelvic organ prolapse stage 2 or greater who underwent vaginal hysterectomy with and without vaginal vault fixation from 2009 to 2014 seen at the urogynecology clinic of a Philippine tertiary referral center. The cohorts were divided into those with iliococcygeal fixation (n=171) and those without (n=83). The Z test of mean difference was used in comparing average values between the two groups. Chi-square test of independence was used in comparing the proportion of patients as stratified by various variables and their corresponding groups, while some variables were adjusted for 2x2 Fischer Exact test. Any associated p-value less than 0.05 alpha were considered statistically significant.

Results. Of the 876 patients operated on for prolapse between 2009 to 2014, 254 were included in the study. They were divided into those with iliococcygeal fixation (n=171) and those without (n=83). Recurrence was significantly lower in the group who underwent iliococcygeal fixation (23.39% vs 36.14%, p=0.037) after a median follow-up of 28.98 months for those with fixation and 31.08 for those without. The posterior compartment prolapse recurrence rate is higher in those without fixation (16.87% vs 6.43%, p=0.013).

Longer duration of menopause (16.96 ± 7.16 vs 13.37 ± 7.1, p=0.001), unemployment (52.85% vs 36.41%, p=0.22) and longer time from surgery (37.84 ± 15.69 vs 26.55 ± 12.59, p=0.000) were significantly associated with recurrence. Moreover, higher pre- (6.24 ± 1.41 vs 5.78 ± 0.95, p=0.003) and post-operative genital hiatus (4.53 ± 0.97 vs 4.23 ± 0.54, p=0.002) and shorter pre-operative perineal body (1.86 ± 0.35 vs 1.97 ± 0.35, p=0.025) measurements were also significantly associated with recurrence. Both groups have no significant difference in urinary, sexual or bowel symptoms.

Conclusion. Iliococcygeus fixation is an effective method of preventing prolapse recurrence. Increased duration of menopause, longer time from surgery, longer genital hiatus, and shorter perineal body all contribute to recurrence. Moreover, urinary, sexual and bowel symptoms do not differ significantly between those with and without iliococcygeus fixation. Thus performing prophylactic vaginal vault fixation should be contemplated in patients undergoing prolapse surgery, with careful consideration of patient factors and potential morbidities.

Keywords: pelvic organ prolapse, recurrence, vaginal hysterectomy

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INTRODUCTION

The incidence of vaginal vault prolapse after a hysterectomy ranges from 6% to 12%.[1-3] Post-hysterectomy pelvic organ prolapse (POP) recurrence that requires surgical repair is seen in 3.6 per 1,000 cases.[4] The Section of Urogynecology and Pelvic Reconstructive Surgery of a Philippine tertiary center has seen 1,847 cases of pelvic organ prolapse at the out-patient clinic from 2006 to 2014, 2.8% of them are recurrent prolapse cases.

Several authors have reported good subjective and objective outcomes with the use of sacrospinous fixation, iliococcygeus fixation, or cul-de-sac obliteration (McCall culdoplasty) as prophylaxis for post-hysterectomy vault prolapse.[5-8] The Division of Urogynecology and Pelvic Reconstructive Surgery has adopted the performance of McCall culdoplasty in patients who undergo vaginal hysterectomy for prolapse while iliococcygeus fixation is done for patients with advanced-stage disease.

However, the question of the clinical value of these prophylactic procedures remains. A study by Prodigalidad et al. concluded that the probability of vault prolapse was not found to correlate with the degree or severity of uterine prolapse.[9] This is supported by the findings of Colombo et al., showing that the outcomes of McCall culdoplasty and sacrospinous ligament suspension (SSLS) were not significantly different.[6] Moreover, there is apprehension in doing such procedures because of the potential for complications.

This study is a retrospective study that aims to evaluate the incidence of recurrence of prolapse in women who have undergone vaginal hysterectomy with and without vaginal vault fixation for pelvic organ prolapse stage II or higher. Moreover, the study also desires to identify risk factors for recurrence following vaginal hysterectomy as well as evaluate urinary, bowel, and sexual symptoms in those who undergo vaginal vault fixation and those without.

MATERIALS AND METHODS

This is a retrospective study conducted in a Philippine tertiary referral center from January to December 2015, approved by the Research Ethics Board of the institution.

The study population consisted of adult women with pelvic organ prolapse stage 2 or greater who underwent vaginal hysterectomy with and without vaginal vault fixation from 2009 to 2014 consulting at the urogynecology clinic of a tertiary referral center. Purposive sampling was used. A total of 460 patients, 230 for each group, are necessary for the study to gain 80% significance, computed using the Open Epi Info Tool. Non-ambulatory patients and those operated on for post-hysterectomy vaginal vault prolapse were excluded from the study.

The lead investigator discussed the details, goals, and benefits of the research to each patient before seeking their consent to participate in the study. Hospital case records and urogynecology clinic charts were reviewed for pre-operative and perioperative data. An information data form documenting demographic data, risk factors for prolapse recurrence, and surgical characteristics of each patient were also completed.

At the consult, the patients were evaluated using a comprehensive questionnaire with 24 questions on urinary, bowel, and sexual symptoms. The questions are quantified through an arithmetic sum of responses to each. Values of 1 to 4 are assigned for each question in ascending order of severity. A high total score reflects poor quality of life while a low score indicates a good quality of life.

After completing the questionnaires, the patients were examined in the dorsal lithotomy position using the Pelvic Organ Prolapse Quantification (POP-Q) system. Maximum prolapse is demonstrated by asking the patient to cough or perform a Valsalva maneuver along with an examination of each of the compartments.

Recurrence of prolapse was defined as the prolapse of any of the compartments to stage 2 or greater using the POP-Q scoring system. The values used to identify recurrence of prolapse within the anterior compartment was Ba, in the posterior compartment was Bp, and the apical compartment was C. Secondary outcomes include identification of risk factors and bladder, bowel and sexual symptoms.

Patients' profiles which were categorical types were expressed in frequency and percentages while those profiles which were continuous were indicated using mean and standard deviation.

In comparing the average values between the two groups (with and without vaginal vault fixation), the Z test of mean difference was used. On the other hand, in comparing the proportions of patients as stratified by various variables and their corresponding groups (with and without vaginal vault fixation), the Chi-square test of independence was used with appropriate contingency tables while some variables were adjusted for the 2 x 2 Fischer Exact test. Any associated p-values lesser than 0.05 alpha were considered statistically significant. IBMSPSS version 21 was used as statistical software.

RESULTS

Of the 1,847 prolapse patients seen at the urogynecology clinic from 2006 to 2014, 876 patients underwent prolapse surgery. Of these 876 patients, 254 patients were included in the study, 607 were either lost to follow-up or could not be contacted while the rest were non-ambulatory or had undergone post-hysterectomy prolapse surgery, thus falling into exclusion. (Figure 1)

Of the 254 patients included in the study, 16 underwent vaginal hysterectomy with anterior and posterior colporrhaphy only, 67 underwent vaginal hysterectomy, anterior and posterior colporrhaphy with McCall culdoplasty alone while 171 underwent a vaginal hysterectomy, anterior

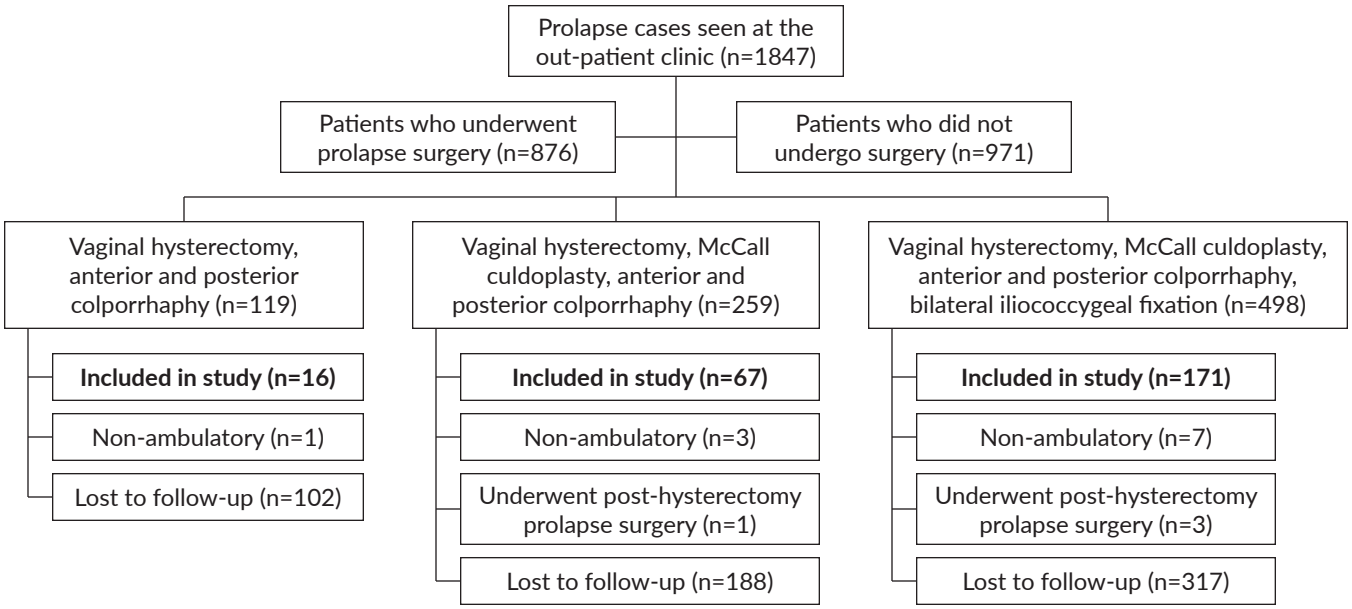

Figure 1. Summary of Subject Inclusion and Exclusion.

and posterior colporrhaphy, McCall culdoplasty and bilateral iliococcygeal fixation.

Those who underwent vaginal hysterectomy with anterior and posterior colporrhaphy only and those who underwent McCall culdoplasty alone were grouped as those without fixation. Those who had accompanying iliococcygeal fixation procedures were taken as another group.

Table 1 summarizes the demographic data of the two groups showing homogeneity between them in age, marital status, BMI, parity, sexual activity, menopausal status, smoking history, and employment status Baseline surgical characteristics were also homogenous save for the duration of surgery. Most patients who do not undergo fixation take only 1-2 hours for surgery while those with fixation take 2 hours or longer, showing a statistically significant difference.

Table 2 shows the recurrence rate in those with iliococcygeal fixation and those without. The results show a statistically significant difference in the recurrence rate between the two. The table also indicates recurrence per compartment. Only posterior compartment prolapse recurrence is significantly associated with the procedure, showing a higher rate of occurrence in those without fixation.

Table 1. Demographic data

	Without fixation (n=83)	With fixation (n=171)	p-value
Age, years	64 ± 7.44	63.83 ± 8.07	.872
Marital status			1.000
Single	4 (4.82%)	10 (5.85%)	
Married	49 (59.04%)	99 (57.89%)	
Widow	30 (36.14%)	62 (36.26%)	
Body mass index			.681
<18.9 underweight	3 (3.61%)	9 (5.26%)	
18.9-23 normal	30 (36.14%)	67 (39.18%)	
23.1-25 overweight	26 (31.33%)	53 (30.99%)	
25.1-30 obese I	21 (25.3%)	36 (21.05%)	
30.1-35 obese II	3 (3.61%)	6 (3.51%)	
Number of vaginal deliveries			.776
0	1 (1.2%)	1 (0.58%)	
1-3	25 (30.12%)	57 (33.33%)	
4-6	47 (56.63%)	72 (42.11%)	
>6	10 (12.05%)	41 (23.98%)	
Menopausal state			1.000
Non-menopausal	7 (8.43%)	16 (9.36%)	
Menopausal	76 (91.57%)	155 (90.64%)	
Years since menopause	15.24 ± 7.27	16.37 ± 7.32	.270

Table 1. Demographic data *(continued)*

	Without fixation (n=83)	With fixation (n=171)	p-value
Sexual activity			
Pre-operative			.384
None	68 (81.93%)	149 (87.13%)	
Present	11 (13.25%)	16 (9.36%)	
Unknown	4 (4.82%)	6 (3.51%)	
Post-operative			.131
None	66 (79.52%)	150 (87.72%)	
Present	13 (15.66%)	15 (8.77%)	
Unknown	4 (4.82%)	6 (3.51%)	
Smoking history			.535
Non-smoker	78 (93.98%)	164 (95.91%)	
Former smoker	4 (4.82%)	6 (3.51%)	
Current smoker	1 (1.2%)	1 (0.58%)	
Occupation			1.000
Unemployed	34 (40.96%)	70 (40.94%)	
Employed	49 (59.04%)	101 (59.06%)	
Laundrywoman	6 (7.23%)	10 (5.85%)	
Vendor	15 (18.07%)	36 (21.05%)	
Factory worker	9 (10.84%)	6 (3.51%)	
Office clerk	0 (0%)	6 (3.51%)	
Seamstress	3 (3.61%)	9 (5.26%)	
Farmer	5 (6.02%)	9 (5.26%)	
Cook	0 (0%)	4 (2.34%)	
Teacher	5 (6.02%)	2 (1.17%)	
Others	6 (7.23%)	19 (11.11%)	
Prior prolapse surgery			1.000
None	83 (100%)	170 (99.42%)	
Present	0 (0%)	1 (0.58%)	
Months from surgery	31.08 ± 16.94	28.98 ± 12.99	0.275
Accompanying procedure			1.000
None	57 (68.67%)	116 (67.84%)	
With Accompanying procedure	26 (31.33%)	55 (32.16%)	
TVT	8 (9.64%)	22 (12.87%)	
PVS	14 (16.87%)	33 (19.3%)	
Burch colposuspension	2 (2.41%)	0 (0%)	
Others (rectal prolapse surgery)	2 (2.41%)	0 (0%)	
Estimated blood loss			.206
<200 cc	68 (82.93%)	127 (74.27%)	
200-400 cc	14 (17.07%)	43 (25.15%)	
>400 cc	0 (0%)	1 (0.58%)	
Duration of surgery			**0.000**
1-2 hours	28 (34.15%)	15 (8.77%)	
2-3 hours	48 (58.54%)	142 (83.04%)	
>3 hours	6 (7.32%)	14 (8.19%)	
Complications			.438
None	79 (96.34%)	157 (91.81%)	
With Complications	4 (4.82%)	14 (8.19%)	
Hemorrhage	0 (0%)	1 (0.58%)	
Infection	1 (1.22%)	10 (5.85%)	
Bladder injury	1 (1.22%)	0 (0%)	
Bowel injury	0 (0%)	2 (1.17%)	
Pudendal nerve injury	0 (0%)	1 (0.58%)	
Others	1 (1.22%)	0 (0%)	

This study also aims to determine risk factors for recurrence. The results show no statistically significant association between the presence of recurrence with the patient's age, BMI, parity, smoking status, concomitant continence procedures, blood loss, duration of surgery, or presence of complications. However, longer duration of menopause, unemployment, and longer time from surgery were significantly associated with recurrence. (Table 3)

Moreover, higher pre- and post-operative genital hiatus measurements and shorter pre-operative perineal

Table 2. Recurrence of prolapse with and without fixation

	Without fixation (n=83)	With fixation (n=171)	Total (n=254)	p-value
With recurrence (Stages 2-4)	30 (36.14%)	40 (23.39%)	70 (27.56%)	**.037**
Without recurrence (Stages 0-1)	53 (63.86%)	131 (76.61%)	184 (72.44%)	
Recurrence Rate Per Compartment				
Anterior compartment				.087
With recurrence	26 (31.33%)	36 (21.05%)	62 (24.41%)	
Without recurrence	57 (68.67%)	135 (78.95%)	192 (75.59%)	
Posterior compartment				**.013**
With recurrence	14 (16.87%)	11 (6.43%)	25 (9.84%)	
Without recurrence	69 (83.13%)	160 (93.57%)	229 (90.16%)	
Apical compartment				1.000
With recurrence	3 (3.61%)	7 (4.09%)	10 (3.94%)	
Without recurrence	80 (96.39%)	164 (95.91%)	244 (96.06%)	

Table 3. Risk factors for prolapse recurrence

	With Recurrence (Prolapse Stage 2-4) n=70	Without Recurrence (Prolapse Stage 0-1) n=184	p-value
Age, years	63.03 ± 7.82	64.21 ± 7.86	.284
Marital status			.764
Single	3 (4.29%)	11 (5.98%)	
Married	45 (64.29%)	103 (55.98%)	
Widow	22 (31.43%)	70 (38.04%)	
Body mass index			.773
<18.9 underweight	1 (1.43%)	11 (5.98%)	
18.9-23 normal	28 (40%)	69 (37.5%)	
23.1-25 overweight	19 (27.14%)	60 (32.61%)	
25.1-30 obese I	15 (21.43%)	42 (22.83%)	
30.1-35 obese II	7 (10%)	2 (1.09%)	
Number of vaginal deliveries			.767
0	0 (0%)	2 (1.09%)	
1-3	22 (31.43%)	60 (32.61%)	
4-6	39 (55.71%)	80 (43.48%)	
>6	9 (12.86%)	42 (22.83%)	
Menopausal state			.464
Non-menopausal	8 (11.43%)	15 (8.15%)	
Menopausal	62 (88.57%)	169 (91.85%)	
Years since menopause	16.96 ± 7.16	13.37 ± 7.1	**0.001**
Smoking history	13.37 ± 7.1		1.000
Non-smoker	67 (95.71%)	175 (95.11%)	
Former smoker	3 (4.29%)	7 (3.8%)	
Current smoker	0 (0%)	2 (1.09%)	
Occupation			**.022**
Unemployed	37 (52.86%)	67 (36.41%)	
Employed	33 (47.14%)	117 (63.59%)	
Laundrywoman	3 (4.29%)	13 (7.07%)	
Vendor	15 (21.43%)	36 (19.57%)	
Factory worker	4 (5.71%)	11 (5.98%)	
Office clerk	0 (0%)	6 (3.26%)	
Seamstress	3 (4.29%)	9 (4.89%)	
Farmer	1 (1.43%)	13 (7.07%)	
Cook	2 (2.86%)	2 (1.09%)	
Teacher	2 (2.86%)	5 (2.72%)	
Others	3 (4.29%)	22 (11.96%)	
Prior prolapse surgery			1.000
None	70 (100%)	183 (99.46%)	
Present	0 (0%)	1 (0.54%)	
Months from surgery	37.84 ± 15.69	26.55 ± 12.59	**0.000**

Table 3. Risk factors for prolapse recurrence *(continued)*

	With Recurrence (Prolapse Stage 2-4) n=70	Without Recurrence (Prolapse Stage 0-1) n=184	p-value
Accompanying procedure			.367
None	51 (72.86%)	122 (66.3%)	
With Accompanying procedure			
Tension-free vaginal tape	6 (8.57%)	24 (13.04%)	
Pubovaginal sling	10 (14.29%)	37 (20.11%)	
Burch colposuspension	1 (1.43%)	1 (0.54%)	
Others	2 (2.86%)	0 (0%)	
Estimated blood loss			
<200 cc	53 (76.81%)	142 (77.17%)	.868
200-400 cc	15 (21.74%)	42 (22.83%)	
>400 cc	1 (1.45%)	0 (0%)	
Duration of surgery			.970
1-2 hours	12 (17.39%)	31 (16.85%)	
2-3 hours	52 (75.36%)	138 (75%)	
>3 hours	5 (7.25%)	15 (8.15%)	
Complications			1.000
None	65 (94.2%)	171 (92.93%)	
With Complications	5 (7.14%)	13 (7.07%)	
Hemorrhage	0 (0%)	1 (0.54%)	
Infection	3 (4.35%)	8 (4.35%)	
Bladder injury	0 (0%)	1 (0.54%)	
Bowel injury	1 (1.45%)	1 (0.54%)	
Pudendal nerve injury	0 (0%)	1 (0.54%)	
Others	0 (0%)	1 (0.54%)	
Pre-Operative			
Genital Hiatus	6.24 ± 1.41	5.78 ± 0.95	**0.003**
Perineal Body	1.86 ± 0.35	1.97 ± 0.35	**0.025**
Total Vaginal Length	7.53 ± 0.9	7.48 ± 0.84	0.685
Post-Operative			
Genital Hiatus	4.53 ± 0.97	4.23 ± 0.54	**0.002**
Perineal Body	3.5 ± 0.5	3.49 ± 0.51	0.939
Total Vaginal Length	6 ± 0.42	5.97 ± 0.5	0.661

body measurements are also significantly associated with recurrence. (Table 3)

Both groups have no significant differences in urinary, sexual, or bowel symptoms. (Table 4)

DISCUSSION

Women have an 11% lifetime risk of undergoing surgery for prolapse by the age of 80. A third of these women have recurrent pelvic organ prolapse requiring surgery.[10] Risk increases with increasing time since surgery from 1% at 3 years to 5% at 15 years.[4] Because of this risk for recurrence, several prophylactic apical fixation procedures have been described.

The Section of Urogynecology and Pelvic Reconstructive Surgery of the UP-PGH has adopted the use of McCall culdoplasty for enterocoele prevention and bilateral ilio-coccygeal fixation to address apical compartment prolapse. McCall culdoplasty involves the placement of 1–3 'internal' (intraperitoneal) sutures from one uterosacral liga-ment to the other incorporating the peritoneum of the cul de sac, thus obliterating it. The most distal suture is then brought out into the vagina to anchor the distal uterosacral ligament pedicles to the vaginal vault. Iliococcygeal fixation, on the other hand, serves to suspend the vaginal apex to the muscular wall of the iliococcygeus and its overlying fascia, providing apical support.

The patients in this study were homogenous in both groups to demographic variables and surgical characteristics, save for the duration of surgery. The average age of the women included was 63 to 64 years. Most were married, of normal BMI, multiparous, menopausal, and non-smokers. The study also showed that most of these elderly women remain employed, with the majority being vendors. Here we were able to appreciate that the risk factors which may have predisposed them to develop the prolapse are still present post-operatively, exposing them to recurrence.

As reflected in the results, both methods are relatively safe for prolapse surgery. Blood loss is usually less than 200 cc and there is also no significant difference in the complication rates between the two. Only the duration of surgery showed a statistically significant difference possibly because, as one would expect, an additional procedure will increase the operative time. However, the duration of surgery did not affect prolapse recurrence.

Table 4. Prolapse-related urinary, sexual and bowel symptoms after vaginal hysterectomy with and without vaginal vault fixation

	Without Fixation (n=83)	With Fixation (n=171)	p-value
Prolapse-related urinary symptoms			
Frequency			1.000
None	79 (95.18%)	161 (94.15%)	
1-2 hrs	4 (4.82%)	10 (5.85%)	
Nocturia			0.087
0	50 (60.24%)	122 (71.35%)	
1	11 (13.25%)	19 (11.11%)	
2	17 (20.48%)	24 (14.04%)	
3	5 (6.02%)	5 (2.92%)	
4	0 (0%)	1 (0.58%)	
Dysuria			1.000
Never - 1	82 (98.8%)	169 (98.83%)	
Occasionally – 2	1 (1.2%)	2 (1.17%)	
Hematuria			
Never – 1	83 (100%)	171 (100%)	
Stress incontinence			0.250
Never – 1	81 (97.59%)	170 (99.42%)	
Occasionally – 2	2 (2.41%)	1 (0.58%)	
Urgency			1.000
Never – 1	79 (95.18%)	161 (94.15%)	
Occasionally – 2	4 (4.82%)	9 (5.26%)	
Weekly - 3	0 (0%)	1 (0.58%)	
Urge incontinence			1.000
Never – 1	79 (95.18%)	163 (95.32%)	
Occasionally – 2	4 (4.82%)	6 (3.51%)	
Weekly - 3	0 (0%)	2 (1.17%)	
Incomplete emptying			0.553
Never - 1	83 (100%)	168 (98.25%)	
Occasionally - 2	0 (0%)	3 (1.75%)	
Prolapse-related sexual symptoms			
Dyspareunia			0.722
Never – 1	81 (97.59%)	164 (95.91%)	
Occasionally – 2	2 (2.41%)	6 (3.51%)	
Weekly - 3	0 (0%)	1 (0.58%)	
Prolapse-related bowel symptoms			
Bowel movement			1.000
Normal - 1	82 (98.8%)	167 (97.66%)	
Constipated - 2	1 (1.2%)	4 (2.34%)	
Fecal incontinence			1.000
Never – 1	83 (100%)	170 (99.42%)	
Occasionally - 2	0 (0%)	1 (0.58%)	

Iliococcygeal fixation was performed in most cases of advanced prolapse. Recurrence was significantly lower in those with iliococcygeal fixation, showing the value of this prophylactic procedure in prolapse surgery. This is because iliococcygeal fixation reinforces apical support by suspending the vaginal vault to a fascial structure, increasing its stability.

Recurrence was also analyzed per compartment. The study shows a significantly higher posterior compartment recurrence in those without fixation compared to those who did. This is because the iliococcygeal fixation exerts its force posteriorly, thus effectively supporting this compartment. For both groups, the majority of the recurrence is seen in the anterior. In a standing female, the lower one-third of the vagina remains parallel to the long axis of the body, while the upper two-thirds of the vagina lies in a horizontal axis over the muscular levator plate. With straining, this axis becomes more marked as the vagina approaches the pelvic floor. As such, the anterior compartment is working against the effect of gravity, predisposing to the descent of this compartment.

A systematic review by Vergeldt and colleagues investigating the risk factors for recurrent POP showed that weight, age, previous prolapse surgery, and concomitant procedures had a significant association with recurrence, defined as prolapse of stage 2 or greater in any of the compartments.[11] These findings are not seen in our study.

This study shows a significant positive correlation between longer time from menopause, longer time from surgery, and unemployment with prolapse recurrence. The hypoestrogenic state during menopause reduces tissue elasticity and causes weakening of the pelvic floor musculature and connective tissue, which results in loss of pelvic organ support. Moreover, the longer the time from surgery, the higher the incidence of recurrent prolapse in these women, proving that there is deterioration in the durability of surgical repair with time. Recurrence is also seen more frequently in the unemployed population, which includes patients who remain housewives and who may still be performing heavy chores.

A wider genital hiatus and a shorter perineal body also predispose to recurrence. This occurs because of poor endopelvic fascial support and the detachment of the rectovaginal septum from the perineal body, called perineal descent. The weaker the remaining fascia is, the more prone it is to recurrence despite the correction. This finding allows doctors to counsel these patients pre-operatively on their higher risk for recurrence. This way, they can encourage patients to find other means to mitigate this possibility.

Furthermore, there was no significant difference in urinary, sexual, or bowel symptoms between those with and without vaginal vault fixation, indicating that iliococcygeal fixation does not significantly affect these functions post-operatively.

This study is limited by its small sample size, computed as achieving 51.6% significance using the Open Epi Info Tool. Moreover, it is retrospective in nature, thus prohibiting us from determining certain aspects such as random assignment and choice of prolapse procedure. Despite this, the study was able to show a statistically significant difference, favoring iliococcygeal fixation to help prevent a recurrence. The study's strength is the assessment of both anatomical and functional aspects after prolapse surgery, allowing us to gain a more thorough evaluation of patient satisfaction which ultimately will guide further decision-making. A randomized controlled trial with an ample sample size comparing objective and subjective outcomes after prolapse surgery is then recommended to confirm the findings.

CONCLUSION

Iliococcygeal fixation is an effective method of preventing prolapse recurrence. Increased duration of menopause, longer time from surgery, longer genital hiatus, and shorter perineal body all contribute to recurrence. Moreover, urinary, sexual and bowel symptoms do not differ significantly between those with and without iliococcygeus fixation. Thus performing prophylactic vaginal vault fixation should be contemplated in patients undergoing prolapse surgery, with careful consideration of patient factors and potential morbidities.

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Statement of Authorship

Concept and design; data acquisition, analysis, and interpretation; drafting, revising, and final approval of the manuscript; both agree to be accountable for all aspects of the work.

Both authors participated in data collection and analysis, and approved the final version submitted.

Author Disclosure

No real or apparent conflict of interest may have a direct bearing on this research. There is no collaboration with pharmaceutical companies or other entities whose products or services may be related to the subject matter of the study or who have sponsored the study.

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REFERENCES

1. Aigmueller T, Dungl A, Hinterholzer S, Geiss I, Riss P. An estimation of the frequency of surgery for posthysterectomy vault prolapse. Int Urogynecol J. 2010 Mar;21(3):299-302.
2. Bai SW, Kim EH, Shin JS, Kim SK, Park KH, Lee DH. A comparison of different pelvic reconstruction surgeries using mesh for pelvic organ prolapse patients. Yonsei Med J. 2005 Feb 28;46(1):112-8.
3. Marchionni M, Bracco GL, Checcucci V, Carabaneanu A, Coccia EM, Mecacci F, Scarselli G. True incidence of vaginal vault prolapse. Thirteen years of experience. J Reprod Med. 1999 Aug;44(8):679-84.
4. Mant J, Painter R, Vessey M. Epidemiology of genital prolapse: observations from the Oxford Family Planning Association Study. Br J Obstet Gynaecol. 1997 May;104(5):579-85.
5. Cruikshank SH, Cox DW. Sacrospinous ligament fixation at the time of transvaginal hysterectomy. Am J Obstet Gynecol. 1990 Jun;162(6):1611-5; discussion 1615-9.
6. Colombo M, Milani R. Sacrospinous ligament fixation and modified McCall culdoplasty during vaginal hysterectomy for advanced uterovaginal prolapse. Am J Obstet Gynecol. 1998;179(1):13-20.
7. Meeks GR, Washburne JF, McGehee RP, Wiser WL. Repair of vaginal vault prolapse by suspension of the vagina to iliococcygeus (prespinous) fascia. Am J Obstet Gynecol. 1994 Dec;171(6):1444-52; discussion 1452-4.
8. Maher CF, Murray CJ, Carey MP, Dwyer PL, Ugoni AM. Iliococcygeus or sacrospinous fixation for vaginal vault prolapse. Obstet Gynecol. 2001 Jul;98(1):40-4.
9. Prodigalidad LT, Peled Y, Stanton SL, Krissi H. Long-term results of prolapse recurrence and functional outcome after vaginal hysterectomy. Int J Gynaecol Obstet. 2013 Jan;120(1):57-60.
10. Olsen AL, Smith VJ, Bergstrom JO, Colling JC, Clark AL. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. Obstet Gynecol. 1997 April;89(4):501–6.
11. Vergeldt TF, Weemhoff M, IntHout J, Kluivers KB. Risk factors for pelvic organ prolapse and its recurrence: a systematic review. Int Urogynecol J. 2015 Nov;26(11):1559-73.