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RESEARCH ARTICLE
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EFFECTIVENESS OF SLING PROCEDURES FOR UTERO-VAGINAL PROLAPSE: A CROSS-SECTIONAL STUDY AT AYUB TEACHING HOSPITAL, ABBOTTABAD

Dr. Ruqqia Sultana[1*], Ata Ur Rehman[2], Asad Zia Khan[3], Irrat Ayesha[4], Laraib Sarwar[5], Asfand Yar Ahmad[6], Javeria Rehman[7], Bahar Ali[8].

[1*]Professor at Department of obstetrics and Gynecology, Head of Department, Obstetrics and Gynecology Unit C, ATH, Abbottabad.
[2]Final year MBBS student at Ayub Medical College Abbottabad.
[3]Final year MBBS student at Ayub Medical College Abbottabad.
[4]Final year MBBS student at Ayub Medical College Abbottabad.
[5]Final year MBBS student at Ayub Medical College Abbottabad.
[6]Final year MBBS student at Ayub Medical College Abbottabad.
[7]Final year MBBS student at Ayub Medical College Abbottabad.
[8]Final year MBBS student at Ayub Medical College Abbottabad.

***Corresponding Author:** Dr. Ruqqia Sultana
[1]Professor at Department of obstetrics and Gynecology, Head of Department, Obstetrics and Gynecology Unit C, ATH, Abbottabad.

Abstract:

Background: Uterovaginal prolapse (UVP) can significantly impair quality of life in women, underscoring the need for evidence-based treatment solutions. While sling procedures have gained popularity in managing UVP, their effectiveness requires further evaluation.

Objective: To assess the safety and efficacy of sling procedures in management of UVP and assess patient satisfaction.

Design: Cross-sectional study.

Setting: Ayub Teaching Hospital, Abbottabad.

Population or sample: We included 17 patients aged 30-59 years who underwent sling procedures over a 2-year period, with varying degrees of prolapses.

Methods: A retrospective analysis of case records from 2022 to 2024 was conducted to assess improvements in quality of life, prolapse symptoms, complications and patient satisfaction. Data were collected using structured questionnaires, analysed using SPSS 202, and presented with MS Word.

Main outcome measures: Study aimed to measure the effectiveness of sling procedure in improving symptoms, recurrence and complications.

Results: The study included 17 female patients with an average age of 41.18 ± 9.221 years, ranging from 30 to 59 years, with the majority falling within the 30-39 age group. Most patients (82.35%) underwent spinal anesthesia, while the remaining received general anesthesia. The severity of prolapse varied, with 11 patients diagnosed with second-degree prolapse, 4 with third-degree, and 2 with first-degree prolapse. There was a significant correlation between age and prolapse severity, with older patients more likely to experience advanced stages of prolapse ($p=0.036$). No intraoperative or postoperative complications were noted, and all patients expressed high levels of satisfaction with the

procedure. Follow-up assessments showed no reported complaints, demonstrating a successful surgery with no complications during recovery.

Conclusion: This retrospective case report analysis confirms the effectiveness of sling procedures in treating UVP, offering a valuable treatment option for patients. The findings support the use of sling procedures as a safe and effective treatment for UVP, with high patient satisfaction and low complication rates.

Funding: This study was conducted independently without any external or institutional funding, based on researchers' own interest.

Introduction:

Utero-vaginal prolapse is a prevalent condition among women seeking gynecological care, accounting for a significant proportion of cases in outpatient departments worldwide, including Pakistan. The incidence of UV prolapse is significantly high among young and middle-aged women, both in our country and around the world, with somewhat similar risk factors and complications. Notably, younger women are disproportionately affected by utero-vaginal prolapse, making it essential for surgical interventions to not only alleviate symptoms but also consider the patient's reproductive potential and ability to conceive in the future. In Pakistan, where family planning and fertility are significant concerns, addressing utero-vaginal prolapse requires a comprehensive approach that balances symptom relief with preservation of reproductive capabilities. This highlights the need for tailored treatment strategies that take into account the unique needs and priorities of young women affected by this condition. By acknowledging the intersection of prolapse management and reproductive health, healthcare providers can provide better healthcare meets the needs of this demographic.[1]

Pelvic organ prolapse is a common concern for women and their healthcare providers, affecting approximately 10% of women by age 80. Normal uterine suspension consists of bones, muscles and connective tissues and has three levels of support.

Level I support consists of the uterosacral and cardinal ligaments, while Level II support comes from the endopelvic fascia and its lateral insertion into the pelvic side wall. Level III （distal vaginal） support is maintained by the endopelvic fascia and perineal body. Congenital weaknesses in the endopelvic fascia and nervous tissue can lead to nulliparous prolapse, while obstetrical factors like mismanaged labor and oversized babies can also contribute. Postmenopausal atrophy of pelvic organs due to hormonal withdrawal further increases the risk of prolapse.[2]

UV prolapse is more prevalent in underdeveloped countries, where a significant number of women deliver at home without proper medical care, often assisted by traditional birth attendants. Limited awareness and lack of access to healthcare services contribute to a higher incidence of prolapse cases. These patients typically experience symptoms and require treatment, which can be either conservative or surgical. However, conservative management often fails and has poor patient compliance, making surgical intervention a more viable option.[3]

There are a number of surgical procedures, each with its advantages and disadvantages. Manchester repair is the most common technique used, especially in women with cervical lengthening. Abdominal sling operations are also used, each with their own set of benefits and drawbacks. A significant advantage of the abdominal approach is that it maintains the normal vaginal length and caliber.[4]

The benefits of uterine preservation via sling surgery are the maintenance of pelvic anatomy. It helps to reduce blood loss, decrease operative time, and reduce the stay in hospital. Furthermore, preserving the uterus appears to have a positive impact on patients' body image, satisfaction, confidence, and their sexual life also. This helps towards an overall betterment in quality of life.[5]

Primary objective of surgical intervention in cases of utero-vaginal （UV） prolapse is to reestablish the normal anatomical and physiological relationships of the pelvic organs, thereby enabling patients to regain a high level of functional capacity and overall well-being. The sling procedures have

demonstrated exceptional efficacy and effectiveness, and they can prove to become the preferred treatment approach for UV prolapse.[6]

Utero-vaginal prolapse is a common condition affecting many women, particularly those who have undergone childbirth or are postmenopausal. It can lead to various symptoms, including pelvic pressure, urinary incontinence, and sexual dysfunction. Sling procedures, which involve the placement of a mesh or tape to support the pelvic organs, have emerged as a popular surgical option for managing this condition. A study was conducted in India on 19 patients with the age group of 17 to 27 years old. The procedure successfully corrected the position of the uterus, maintaining its anteverted orientation. In one instance, an examination during a cesarean in which they confirmed that the sling remained intact and no notable complications during or after the surgery, and none of the cases reported a recurrence of prolapse.[7]

A cohort study was conducted in Scotland which shows that the mesh procedures for addressing anterior and posterior compartment prolapse are not advised as primary repair of prolapse. Both the mesh techniques of vaginal vault prolapse repair shows equal effectiveness and drawback to traditional and other vaginal repair techniques. Consequently, these findings do not distinctly support any specific approach.[8]

A retrospective study was conducted on Sub urethral sling treatment in women with severe vaginal prolapse.In this study patients were divided into two groups. Group 1 of anterior compartment vaginal prolapse and group 2 of posterior compartment vaginal prolapse. Group contain 39 patients while group 2 contain 25 patients. Grade III or IV prolapse of anterior compartment are compared with posterior compartment. By comparing the groups we concluded that only parity shows significant differenceThe stress urinary incontince（SUI） cur rate of group 2 was 100% while that of group 1 was 87% but this difference is of no significant. But this procedure has no effect on the urge incontinence and no urinary retention cases were reported.Patient of SUI and intrinsic sphincter deficiency with severe vaginal prolapse were treated effectively with sling procedure.[9]

A retrospective study was in Canada on patient with severe pelvic organ relaxation and stress urinary incontinence can be effectively treated by surgical procedure, pubovaginal sling combined with colpocleisis. In order to reduce the risks associated with general anesthesia and other invasive surgical techniques, this procedure can be performed quickly and safely under local anesthesia with mild sedation.[10]

An observational study was conducted on patients of utero-vaginal and vault prolapse. In this study, posterior intravaginal slingplasty （IVS） was performed with hysterectomy, anterior colporrhaphy, and transobturator mid-urethral tape insertion,then morbidity associated posterior intravaginal slingplasty was determined. After the procedure, the patients were regularly followed up to 14 months, in which many patients maintained upper genital support, although some developed cystocele and recurrent rectocele. The study shows a significant risk of tape erosion and many patients has high re-operation rate. Increased age over 60 and diabetes treatment were linked to higher erosion risk, while other factors like parity and body mass index did not influence this rate. Overall, posterior IVS is a safe and minimally invasive procedure for upper genital prolapse with high success rate but carries risks of vaginal erosion and re-operation.[11]

A study was conducted in Multan on Abdominal Suspension Operation in which rectus sheath was used as a sling which shows that the abdominal suspension procedure for second-degree uterine prolapse is a straightforward and modified technique that effectively supports the uterus, vagina, bladder, and rectum. There is very less blood loss and a short recovery time.[3]

A cross sectional stud was conducted on 20 patients for the treatment of utero-vaginal prolapse in which modified sling procedure was performed. All 20 patients underwent successful surgery, with only one patient experiencing postoperative fever and another developing a recurrence of prolapse. There were no major intra-operative or postoperative complications. In conclusion,this modified sling procedure is considered easier to perform, associated with negligible blood loss, fewer complications, and shorter operation times, yielding good results. It is also suitable for residents to perform.[12]

Objectives:
The objectives of this study were to analyse the effectiveness of sling procedure in patients with utero-vaginal (UV) prolapse.

Materials and Methodology:
Study design: Cross-Sectional Study.
Setting: Ayub Teaching Hospital Abbottabad.
Study population: Patients of Ayub Teaching Hospital.
Study Duration: 2022-2024
Sampling technique: Consecutive Sampling.
Sample size: We included all 17 consecutive patients who underwent sling procedure and completed all the follow ups.

Inclusion Criteria: Patients diagnosed with UV prolapse (1^{st} degree, 2^{nd} degree or 3^{rd} degree), who underwent sling operation at ATH and completed the follow-ups.

Exclusion Criteria: Patients who did not complete follow-ups, patients with contraindication to surgery and patients who underwent additional surgeries such as TOT or TVT.

Data collection procedure: A close-ended questionnaire was developed for data collection. We collected data from different wards and OPDs of ATH after taking consent from the patients and explaining the study objectives. The data was analyzed by SPSS 22.

Data analysis:
Data was analyzed by using SPSS version 22. Descriptive analysis of the continuous variables such as age was done in the form of mean and standard deviation.Data is presented in the form of figures, charts, and tables with the help of Microsoft Word and SPSS version 22.

Surgical procedure:
The UV prolapses were treated by sling procedure. The women were placed in supine position and after all the surgical SOPs incision was made to explore the abdomen. Dissection was carried out up to rectus sheath and in which horizontal incision was made which can vary according to the degree of prolapse and surgeon's need. A sling was created using the rectus sheath and passed through the inguinal canal. After retracting the peritoneum, it was placed on the posterior side of the uterine isthmus to provide structural support for the prolapsed organs. The sling was then anchored firmly to ensure proper tension and long-term support.

Results:

Table 1: Age of patients

	N	Minimum	Maximum	Mean	Std. Deviation
age of the patient	17	30	59	41.18	9.221
Valid N	17				

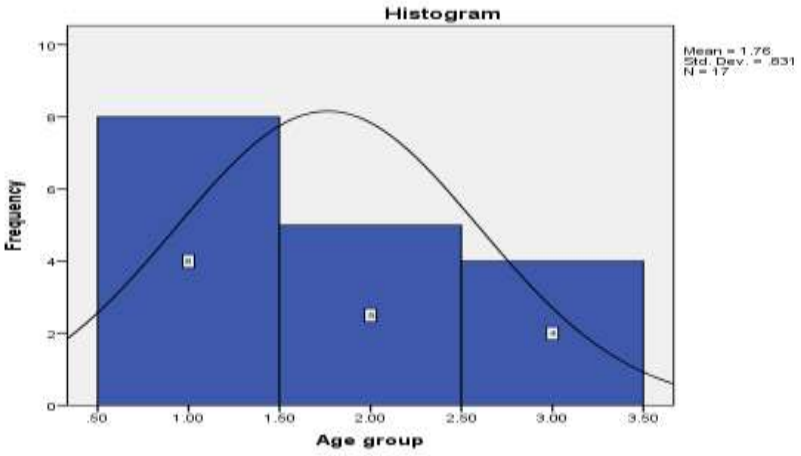

Figure 1: Age groups of patients

We have chosen study population comprising of 17 female patients with mean age of 41.18±9.221 years ranging from 30 to 59 years, as shown in Table 1 and divided them into different age groups as shown in Figure 1. The highest number of patients lied between the age group 30-39 years; i-e 8,5patients between 40-49 years and 4 patients between the age group of 50-60 years.

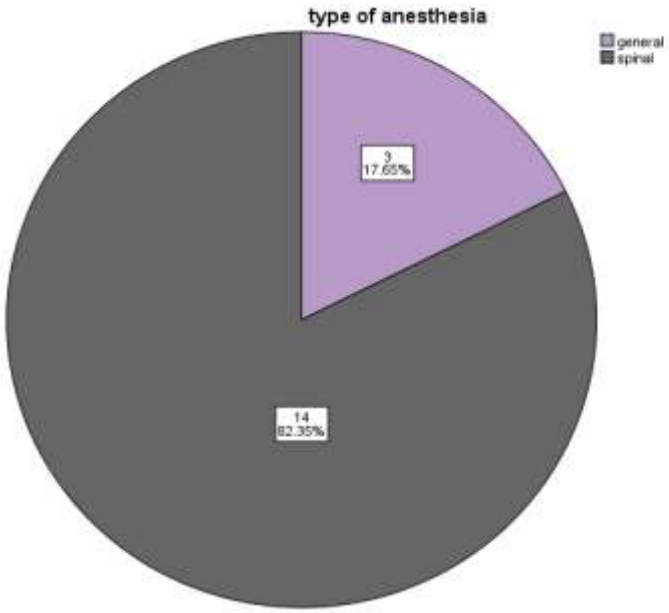

Figure 2: Type of anesthesia

The figure 2 depicts that 82.35% (14) patients were given spinal and 17.65% (3) patients were given general anaesthesia.

Table 2: Symptoms of prolapse VS Indication of operation

		symptoms of prolapse before surgery					
		something coming out of vagina	pressure symptoms	none	Total	p-value	pelvic pain or discomfort before surgery
indication of operation	1st degree prolapse	0	0	2	2	0.00	2
	2nd degree prolapse	0	11	0	11		11
	3rd degree prolapse	4	0	0	4		4
Total		4	11	2	17		17

Table 2 shows the relation between symptoms of prolapse and indication of operation. All the 17 patients came with pelvic pain or discomfort before surgery irrespective of degree of prolapse. Patients with degree 1 prolapse (2) have no specific symptoms of prolapse, second degree prolapse

patients (11) presented with pressure symptoms and third degree patients (4) with something coming out of vagina, with a significant p-value of <0.001.

Table 3: Comorbid conditions prior to surgery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	hypertension	1	5.9	5.9	5.9
	diabetes	1	5.9	5.9	11.8
	none	15	88.2	88.2	100.0
	Total	17	100.0	100.0	

Table 3 shows that 15 out of 17 patients have no comorbid conditions prior to surgery, one has hypertension and one has diabetes.

Table 4: Age group vs indication of operation

		indication of operation						
		first degree prolapse	second degree prolapse	third degree prolapse	Total	df	X2	P-Value
Age group	30-39yrs	2	5	1	8	4	10.287	0.036
	40-49yrs	0	5	0	5			
	50-60yrs	0	1	3	4			
Total		2	11	4	17			

Table 4 shows that as the age progresses severity of prolapse increases, as 5 out of 8 patients (62.5) in age group 30-39 years have second degree prolapse,5out of 5 patients (100%) in age group 40-49 years have second degree prolapse and 3 patients out of 4 (75%) in age group 50-60 years have third degree prolapse, with a significant p-value of 0.036.

Table:5 Surgical Complications

Intra-op complications	Frequency
Hemorrhage	0
Organ injury	0
Bladder perforation	0
Blood transfusion during or after surgery	0
Post-op complications	Frequency
Urinary symptoms	0
Post-op infections	0
Post-op interventions or surgery	0

Table 5 shows there were no complications during or after surgery which show 100% effectiveness of sling procedure.

Table 6: Follow-up complaints

	Number of patients having complaints (out of 17)		
Follow-up complaints	1st week	3rd week	6th week
Pelvic pain or discomfort	0	0	0
Bulge symptoms	0	0	0
Pressure symptoms	0	0	0
None	17	17	17

As shown by table 6, no patient came with any follow up complaints implying perfect success rate with guaranteed results.

Table 7: Satisfaction with the procedure outcome

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	17	100.0	100.0	100.0

All the patients reported high satisfaction with the procedure outcome.

DISCUSSION:

Main findings:

Due to the high frequency of utero-vaginal prolapse in middle-aged women, surgical procedures are crucial for both symptom relief and future fertility assurance. We have examined the efficacy and results of the sling operation in our research and have contrasted it with other previous studies.

In our study, we discovered that 62.5% of women complained of grade 2 prolapse, for which they had surgery within the 30-39 age range, and 75% had third-degree prolapse in older age. These findings are comparable to a population-based study carried out in Pakistan, which found that 37.8% of women had POP of grade III or IV, requiring surgical treatment[13].

Strengths and limitations:

While no intraoperative or postoperative problems were noted in our investigations, a 2012 study found that the sling group had increased incidence of bladder perforation, urinary tract infection, significant bleeding issues, and incomplete bladder emptying in the first six weeks following surgery[14].

Perhaps as a result of the larger sample size used in a later investigation.

While less than 1% of procedures result in significant bleeding, this is in line with our research, which found no evidence of intraoperative or postoperative hemorrhage. Significant bleeding is a potential intraoperative consequence of mid urethral sling insertion.[15]

In contrast to our research, where women do not come in with any problems later on—possibly due to our smaller sample size—one study found that the rate of urine incontinence at three months and twelve months following sling surgery was 23.6% and 27.3%, respectively, in a large sample size.

Interpretation:

All 17 patients, or 100%, had experienced pelvic pain or discomfort prior to surgery, regardless of the severity of prolapse. One study conducted in India found that 88% of women had a mass per vagina, indicating third degree prolapse, while 11% of patients with degree 1 prolapse (2) had no specific symptoms of prolapse,64%of patients with second degree prolapse (11) had pressure symptoms, and 23% of third degree patients (4) had something coming out of the vagina. These findings were statistically significant with a p-value of less than 0.001. Twenty patients (80%) experienced vaginal discharge, eight patients (32%) experienced abdominal pain, four patients (16%) experienced infertility, and eight patients (72%), backaches.[16]

While in a 2016 comparative study, it was discovered that monitored anesthesia care may offer significant benefits over general anesthesia in women undergoing retro pubic midurethral sling, including shorter recovery and operating room times, lower costs, and less voiding dysfunction in the immediate postoperative period. In our setting, spinal anesthesia was preferred, so 82.35% of women received it while 17.65% of women received general anesthesia. In women having a retro pubic midurethral sling, monitored anesthetic care may have several advantages to general anesthesia, such as reduced recovery and operating room times, lower expenses, and less voiding problems in the early postoperative phase.[17]

In general in our research having small sample size outcomes of sling procedure are excellent with reduced intra op and post op issues and no follow up concerns.

Conclusion: This retrospective case report analysis from 2022 to 2024 shows that the sling procedure was completely effective in treating UVP, offering a valuable treatment option for patients, as no patient experienced a recurrence or symptoms after surgery.The findings support the use of sling procedures as a safe and effective treatment for UVP, with high patient satisfaction and low complication rates, though further studies with larger groups could helped confirm these findings.

Recommendation:

1. The sling procedure, with a 100% success rate and no complications, should be considered a standard treatment for UV prolapse, particularly in patients with pelvic pain or pressure symptoms.

2. While results are promising, larger studies are needed to confirm these findings and improve generalizability across diverse populations.
3. Spinal anesthesia, used in 82.35% of cases with positive results, should be considered the preferred option for sling procedures due to lower risks than general anesthesia.

Declarations:

Author Contributions:

All authors contributed significantly to this research. Dr. Ruqqia Sultana and Ata Ur Rehman conceived and designed the study. The introduction and literature review was written by Asfand Yar Ahmad and Asad Zia Khan. Data collection was done be all the authors. Materials and methodology were prepared by Javeria Rehman. Ata Ur Rehman developed the questionnaire and assisted with data entry. Data analysis, as well as the creation of results, tables, and figures, were performed by Irrat Ayesha. Laraib Sarwar took the lead in drafting the discussion. Manuscript was prepared and submitted by Ata Ur Rehman and Asad Zia Khan. Dr. Ruqqia Sultana provided supervision and critical revisions. The manuscript was reviewed and approved by all authors.

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Ethical Statement:

This study was conducted following ethical standards as approved by the ethics committee of "Institutional Medical & Ethics Review Committee of Ayub Medical Teaching Institution Abbottabad" with approval granted on 20th August 2024. Fully informed consent was taken from all the participants.

Ethics Approval:

Ethics approval for this study, titled "Effectiveness of Sling Procedure in UV Prolapsed Patients: A Cross-Sectional Study at ATH Abbottabad", was obtained from the Institutional Medical & Ethics Review Committee （IM&ERC） of Ayub Medical Teaching Institution, Abbottabad. The approval was granted on 20th August 2024, with the reference number RC-EA-2024/251.

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