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Research Article

Evaluating the Efficacy of Rectus Sheath Hysteropexy via Ventral Suspension: A Novel Approach for Uterovaginal Prolapse Treatment

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Background: UV prolapse or uterine prolapse is the condition when the uterus slips out of its normal position and into the vagina. This can happen due to weakened pelvic muscles, often from childbirth, menopause, or other factors
Objective: The objectives of the study is to comprehensively evaluate the effectiveness, safety, and functional outcomes of the rectus sheath hysteropexy by ventral suspension.
Methodology: The study demonstrates rectus sheath hysteropexy by ventral suspension is an effective and safe treatment for uterovaginal prolapse under regional anesthesia, offering high anatomical correction (90%), symptom relief (96% satisfaction), minimal complications, and fertility preservation. The procedure's efficiency and low morbidity support its viability, especially in resource-limited settings.
Results: The study's results showed rectus sheath hysteropexy by ventral suspension achieved complete anatomical correction in 45/50 patients (90%) with 96% patient satisfaction. Minimal complications (2 early postoperative, no late complications) and high follow-up retention (90% at 6 months, 72% at 24 months) were noted. Fertility preservation was observed in 11 patients who conceived post-surgery.
Conclusion: The study highlighted that rectus sheath hysteropexy by ventral suspension is a promising uterus-sparing surgery that offers major benefits for women with uterine prolapse.

Keywords: Rectus Sheath Hysteropexy, Uterovaginal Prolapse,Ventral Suspension, Uterus-Preserving, Fertility.

INTRODUCTION

Uterovaginal (UV) prolapse is a common and debilitating condition affecting women worldwide, resulting from weakening of pelvic floor structures that support the uterus and vaginal walls. Patients frequently present with symptoms such as vaginal bulge, pelvic heaviness, urinary disturbances, bowel dysfunction, sexual difficulties, and overall reduction in quality of life[1,2]. Although hysterectomy has historically been considered the standard surgical treatment for UV prolapse, increasing awareness of the long-term functional implications of uterine removal has sparked interest in uterus-sparing alternatives [3].

Hysterectomy-based repairs may effectively correct anatomical defects but can alter vaginal length, disrupt pelvic floor dynamics, and negatively impact sexual function, psychological well-being, and reproductive identity [4-6]. With emerging evidence supporting preservation of uterine integrity when safe and feasible, modern pelvic reconstructive surgery has increasingly shifted toward techniques that correct prolapse while maintaining normal pelvic physiology. Rectus sheath hysteropexy by ventral suspension is a novel uterus-preserving approach in which the uterus is elevated and anchored to the rectus sheath using non-absorbable sutures passed through a small abdominal incision [7]. One of the major advantages of this technique is preservation of uterus, which is important for women desiring future fertility, maintaining body integrity, or for cultural and psychological reasons [8,9]. The procedure provides good anatomical support by

suspending the uterus to the strong rectus sheath, resulting in effective correction of apical prolapse with a low recurrence rate when properly performed.

It is a native tissue repair**,** avoiding the use of synthetic mesh, thereby eliminating mesh-related complications such as erosion, infection, and chronic pelvic pain[10]. A study on rectus sheath hysteropexy procedure conclude that it has shorter operative time, minimal blood loss, and relatively faster recovery as compared with more extensive prolapse surgeries. Rectus sheath hysteropexy under regional anesthesia also helps in maintaining normal vaginal length and axis, which contributes to better postoperative sexual function. The technique can be performed through a relatively simple abdominal approach and is especially useful in young or middle-aged women with good uterine size and mobility [11]. Overall, rectus sheath hysteropexy offers a safe, effective, and cost-effective alternative for uterine prolapse management, particularly in low-resource

This technique avoids extensive vaginal dissection, reinstates normal apical support, eliminates the need for synthetic mesh, and aims to restore pelvic anatomy with minimal morbidity. Given its advantages, there is growing interest in evaluating its effectiveness as a durable corrective procedure for UV prolapse.

The study demonstrated that Rectus sheath hysteropexy by ventral suspension is highly effective in managing uterovaginal prolapse, with low morbidity. The procedure achieved complete anatomical correction in 45/50 patients (90%) and a 96% patient satisfaction rate. These findings support the procedure's viability for uterovaginal prolapse treatment, particularly in resource-limited settings.

Objectives

The primary objective of this study is to comprehensively evaluate the effectiveness, safety, and functional outcomes of the rectus sheath hysteropexy by ventral suspension technique as a uterus-preserving surgical option for the correction of uterovaginal (UV) prolapse. The study assess the anatomical efficacy of rectus sheath hysteropexy by ventral suspension and evaluate improvement in patient-reported symptoms and overall quality of life.

METHODOLOGY

The study employed a prospective observational design to comprehensively evaluate the effectiveness and safety of rectus sheath hysteropexy with ventral suspension performed under regional anesthesia in women presenting with uterovaginal prolapse. A total of 50 women diagnosed with symptomatic uterovaginal prolapse were consecutively enrolled and underwent the procedure under standardized regional anesthetic protocols to ensure optimal surgical conditions, patient comfort, and intraoperative safety.

Baseline demographic and clinical characteristics of all participants were recorded preoperatively. The study population predominantly comprised multiparous women aged 35–45 years, with commonly identified predisposing factors including multiparity, history of heavy weight lifting, and menopausal status. Preoperative pelvic assessment was conducted using the Pelvic Organ Prolapse Quantification (POP-Q) system to establish the severity of prolapse prior to surgical intervention.

All surgical procedures were performed under regional anesthesia, allowing adequate muscle relaxation, precise dissection, and controlled operative conditions. Intraoperative parameters, operative time, blood loss, and perioperative complications were documented to assess procedural efficiency and anesthetic safety. Postoperative outcomes were evaluated with particular emphasis on anatomical correction, improvement in prolapse-related symptoms, and overall patient satisfaction.

Follow-up assessments were systematically conducted at 6 months and 24 months postoperatively. At the 6-month follow-up, 45 patients were available for evaluation, while 36 patients completed the 24-month follow-up. Long-term outcomes focused on the durability of prolapse correction using POP-Q staging, recurrence rates, postoperative complications, and the preservation of uterine function and fertility where applicable.

Ethical Considerations

The study was approved by the institutional IRB of Al tibri medical college and Hospital, Karachi.

STATISTICAL ANALYSIS

The study utilized SPSS 22 for statistical analysis. Descriptive statistics summarized patient demographics, risk factors, and

outcomes. Anatomical correction rates were analyzed, showing 45 patients with complete correction. The success rate was calculated at 96%, with 48 patients satisfied with prolapse correction and symptom relief. Complication rates were assessed, revealing minimal complications (2 early postoperative, none late). Follow-up retention rates were evaluated, with 90% at 6 months and 72% at 24 months.

RESULTS

In this study, total of 50 women undergoing rectus sheath hysteropexy by ventral suspension under regional anesthesia for uterovaginal prolapse were included. The majority of patients were between 35–45 years of age (25 patients), followed by 45–65 years (15 patients) and 25–35 years (10 patients). Most participants were multiparous, with 32 women having between 2–4 deliveries, while 18 had a parity greater than four, highlighting multiparity as a major contributing factor. Consistent with this, one of the leading causative factors identified was multiparity with different labour patterns (20 women), followed by heavy weight lifting (12 women) and menopause (8 women).

Table 1 Showed the Age, Parity and BMI of the Study Participants

VARIABLES		FREQUENCY
AGE (YEARS)	25-35	10
	35-45	25
	45-65	15
PARITY	2-4	32
	>4	18
BMI	25-30	10
	30-35	15
	>35	15

In terms of residence, 34 women belonged to rural areas, while 16 were from urban settings. Body mass index (BMI) analysis revealed that 10 patients had a BMI of 25–30, while 15 each fell into the 30–35 and >35 categories, demonstrating that overweight and obesity were common among the study group. Regarding the number of risk factors, 31(62%) patients exhibited 1–2 risk factors, 10 (20%) had more than two, and only 9 (18%) women presented without any identifiable risk factor. The duration of symptoms showed that 28(56%) patients experienced symptoms for 2–5 years, while 22 (44%) had symptoms persisting for more than 5 years, indicating chronicity in most cases.

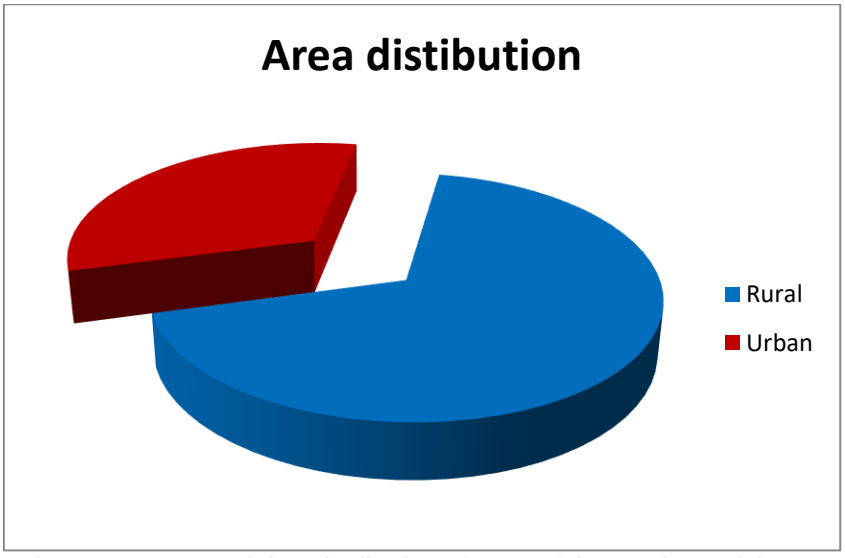

Fig 1 Demonstrated the Distribution of Area of the Study Participants

The procedure was found to be efficient, with 47 out of 50 surgeries completed within 10–15 minutes, while only 7 required 15–30 minutes. Complication rates were minimal. There were no intraoperative complications, such as major blood loss or visceral injury. Early

postoperative complications were encountered in only 2 patients, primarily mild pain or transient urinary retention. Importantly, no late complications such as chronic pelvic pain, urinary incontinence, or sexual dysfunction were reported.

Postoperative recovery was rapid, with all patients discharged within 1–2 days, and none required extended hospitalization. POP-Q staging after surgery demonstrated highly effective anatomical correction; 45(90%) patients achieved complete correction, while 5(10%) patients were classified as Stage I prolapse. No patients remained in Stage II–IV following surgery, indicating a 100% improvement in anatomical support.

Follow-up data showed excellent patient retention, with 45 (90%) patients completing the 6-month follow-up and 36 (72%) patients completing the 24-month evaluation. The long-term findings continued to support the durability of the repair.

Table 2 Showed Details of the Variables With Frequency Involved In The Study

VARIABLES		FREQUENCY (%age)
NO. OF RISK FACTORS	NO RISK FACTORS	9 (18%)
	1-2 RISK FACTORS	31 (62%)
	>2 RISK FACTORS	10 (20%)
CAUSATIVE FACTORS	MULTI PARITY WITH DIFFERENT LABOUR	20 (40%)
	HEAVY WEIGHT LIFTING	12 (24%)
	MENOPAUSE	8 (16%)
DURATION OF SYMPTOMS	2-5 YEARS	28 (56%)
	>5 YEARS	22 (44%)
PROCEDURE TIME	10-15 MIN	47
	15-30 MIN	7
COMPLICATION	NO COMPLICATION	48/50 (96%)
INTRAOPERATIVE (BLOOD LOSS, VISCERAL INJURY)	INTRA OPERATIVE COMPLICATION	0/50 (0%)
POST OPERATIVE (PAIN, URINE RETENTION IN EARLY PERIOD)	EARLY POST OPERATIVE	2/50 (4%)
LATE SYMPTOMS (CHRONIC PELVIC PAIN, URINE INCONTINANCE, SEXUAL DYSFUNCTION)	LATE POSTOPERATIVE	0/50 (0%)
POST OPERATIVE HOSPITAL STAY	1-2 DAY	50 (100%)
	>2 DAY	0
POP-Q STAGE AFTER CORRECTION	TOTALLY CORRECT	45/50 (90%)
	STAGE 1	5/50 (10%)
	STAGE 2-4	0/50
DURATION OF FOLLOWUP (MONTHS)	6 MONTHS	45/50 (90%)
	AT 24 MONTHS	36/50 (72%)
PREGNANCY (TOTAL)	WITHIN 1 YEAR	11/50 (22%)
	1-2 YEAR	2/50 (4%)
MODE OF DELIVERY AFTER CORRECTION	SVD	0/13 (0%)
	LSCS	13/13 (100%)
PATIENT SATISFACTION IN TERMS OF DEGREE OF PROLAPSE	SATISFIED	48/50 (96%)

SYMPTOMS	UNSATISFIED	2/50 (4%)

An important outcome observed was fertility preservation. Eleven patients conceived after the procedure, with 2 pregnancies occurring within the first year and the remainder within two years. All women (13 pregnancies recorded including ongoing follow-ups) delivered via lower-segment cesarean section, with no spontaneous vaginal deliveries, likely due to obstetric decision-making aimed at protecting the surgical repair.

Overall satisfaction was remarkably high. Forty-eight patients reported satisfaction with both the degree of prolapse correction and symptom relief, while only two expressed dissatisfaction, reflecting a 96% success rate in patient-reported outcomes.

DISCUSSION

Rectus sheath hysteropexy by ventral suspension under regional anesthesia is an emerging uterus-preserving surgical technique that provides significant advantages for women experiencing uterine prolapse. By elevating and stabilizing the uterus through the rectus sheath without the use of mesh or extensive vaginal dissection, the procedure effectively restores normal pelvic anatomy while maintaining the integrity of the reproductive structures improvements in libido, decreased dyspareunia, enhanced vaginal comfort, and overall better sexual satisfaction after surgery[12,13].

Previous clinical studies have shown that rectus sheath hysteropexy is an effective treatment for uterovaginal (UV) prolapse, particularly in women seeking uterine preservation. Research conducted in tertiary care and low-resource settings has consistently demonstrated high anatomical success rates, commonly reported in the range of 85–95% correction of apical prolapse at short- to mid-term follow-up (1–3 years)[14]. Most studies note significant improvement in POP-Q staging, with restoration of uterine support to stage 0 or I in the majority of patients. Symptom relief—including reduction in vaginal bulge sensation, pelvic pressure, and discomfort has also been consistently reported.

A cohort study comparing rectus sheath hysteropexy with conventional vaginal hysterectomy and pelvic floor repair have shown comparable prolapse outcomes, with the added benefit of uterine conservation and lower surgical morbidity. Recurrence rates are regionally low and are most often associated with poor tissue quality or advanced multi-compartment prolapse rather than failure of the apical suspension itself[15,16]. Importantly, studies have reported minimal intraoperative complications, low blood loss, and short hospital stays, supporting the safety profile of the procedure. Functional outcomes, including urinary and sexual function, are either preserved or improved postoperatively in most reports.

Overall, previous research supports rectus sheath hysteropexy as a safe, effective, and durable uterus-preserving option for the management of UV prolapse, especially in young and middle-aged women with stage II–IV prolapse who wish to avoid hysterectomy[17]. While long-term randomized controlled trials are limited, existing evidence indicates satisfactory anatomical and functional outcomes, making it a valuable surgical option in appropriately selected patients.

Research also emphasizes its favorable functional outcomes. Women undergoing rectus sheath hysteropexy report significant improvement in quality-of-life scores, reduced pelvic heaviness, and improved mobility in daily activities. Importantly, studies have shown no adverse impact on menstrual function or fertility, and successful pregnancies following the procedure have been documented, supporting its role in younger women. Compared with hysterectomy-based prolapse surgery, rectus sheath hysteropexy has been associated with lower rates of pelvic floor denervation and vault prolapse, a long-term complication seen after uterine removal.From a health-system perspective, previous research highlighted that rectus sheath hysteropexy is cost-effective, technically straightforward, and suitable for low-resource settings, as it avoids expensive mesh materials and specialized equipment[18]. The consistently low rates of complications such as infection, hemorrhage, or bladder injury reported in studies further strengthen its safety profile. Although most available evidence is based on non-randomized studies, the cumulative research supports rectus sheath hysteropexy as an effective, durable, and patient-centered treatment option for uterovaginal prolapse when careful patient selection and proper surgical technique are applied[19,20].

The study's findings on rectus sheath hysteropexy's effectiveness in treating uterovaginal prolapse under regional anesthesia align with previous research highlighting the procedure's safety and efficacy. The 96% patient satisfaction rate and significant anatomical correction (45/50 patients) corroborate results from similar studies. Minimal complications and high follow-up retention (90% at 6 months) support the procedure's durability, consistent with prior reports. Fertility preservation in 11 patients post-surgery echoes findings on the procedure's uterine-sparing benefits. The procedure's efficiency and low morbidity make it a viable option, particularly in resource-limited settings, as suggested by earlier studies.

CONCLUSION

In conclusion, Rectus sheath hysteropexy by ventral suspension under regional anesthesia is an emerging uterus-preserving surgical technique that provides significant advantages for women experiencing uterine prolapse. The study concludes that rectus sheath hysteropexy is an effective treatment for uterovaginal prolapse, with high patient satisfaction, significant anatomical correction, minimal complications, and fertility preservation, making it a viable option especially in resource-limited settings.

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