**Evaluation of Sacrospinous Hysteropexy vs. Uterosacral Suspension for the Treatment of Uterine Prolapse: A Retrospective Assessment**

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**Objective:** This single-center retrospective study aimed to compare the outcomes of vaginal hysterectomy with utero-sacral suspension (VH/USS) versus sacro-spinous hysteropexy (SSHP) in the management of uterine prolapse at a tertiary care center specializing in Urogynecology.

**Methods:** The medical records of 50 women with stage 2 or more uterine prolapse treated with VH/USS (n = 26) or SSHP (n = 24) were assessed between January 2006 and December 2012.

**Results:** There were no significant differences between the two groups in terms of body mass index (BMI) and parity P = 0.881 and 0.304, respectively. VH/USS procedure was significantly more successful than SSHP procedure with regard to anatomical success (84.62 vs. 41.67%, P = 0.0028). There was a significantly higher anterior prolapse recurrence with SSHP procedure than with VH/USS (33.3 vs. 7.7%; P = 0.034). SSHP was associated with the lower likelihood of anatomical success and a higher risk of recurrent anterior prolapse in multivariate logistic regression analyzes adjusting for potential confounders.

**Conclusion:** The findings of this retrospective study indicate that SSHP appears to be associated with less anatomical objective success and an increased risk of recurrent anterior prolapse in comparison to VH/USS. Further validation of our observations by independent investigators is required.

**Key words** sacrospinous hysteropexy, uterine prolapse, uterosacral suspension

1. **INTRODUCTION**

Uterine prolapse has become a very common health problem in recent decades due to the increasing longevity in parallel with the enormous human population growth, while its prevalence reaches 41% in parous women over 50 years of age.1 It has significant adverse effects on a woman’s quality of life, ranging from physical discomfort, psychological and sexual complaints to occupational and social limitations.2 One in every 10 women will have a pelvic organ prolapse that requires surgery. Unfortunately, the prolapse recurs in 29% of women, causing a need for a second surgical intervention.3

In the current debate over the optimal surgical treatment of uterine prolapse, several procedures have been described. Vaginal hysterectomy with utero-sacral suspension (VH/USS) is traditionally the leading surgical procedure for patients with symptomatic uterine prolapse. However, literature has shown that sacro-spinous hysteropexy (SSHP) is a safe and efficient alternative with higher satisfaction in the majority of women.4–6

Comparative non-randomized studies have demonstrated that SSHP is associated with significant quicker recovery, less pain and shorter hospital stay and no significant differences in the anatomical outcome.7–9 On the other hand, the only randomized controlled trial, comparing the two procedures at 1 year follow-up concluded there were more recurrent apical prolapses in the sacro-spinous group than in the hysterectomy group (27 v/s 3%).10 Because of this conflicting evidence there is no clear preference for one procedure over the other. We aimed to compare the anatomical outcomes of VH/USS and SSHP in the surgical management of symptomatic uterine prolapse in a single-center, retrospective study. Additionally, we sought to evaluate the effect of age, parity, and BMI on outcomes of women treated with VH/USS and SSHP.

2. **METHODS**

2.1. Study design

This study is a single-center retrospective study conducted at a tertiary care center specializing in

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Urogynecology (Women’s Specialized Hospital, KFMC Riyadh Saudi Arabia). IRB approval was obtained prior to data collection.

2.2. Study population

The medical records of all the patients who had suffered from symptomatic uterine prolapse of stage 2 or more had subsequently undergone one of the two surgical corrections; VH/USS or SSHP, during the period from January 2006 and December 2012 were assessed. Patients chose the procedure voluntarily after proper counseling of risks and benefits of each surgery.

2.3. Surgeries

Surgeries were performed by two experienced urogynecologists. Unilateral SSHP was conducted by incising posterior vaginal epithelium in midline up to about 2 cm below the posterior cervical lip. Sharp dissection was done from underlying tissues. Dissection continued para rectally sharply and bluntly to reach right ischial spine. Tissues were retracted away with the help of Breisky vaginal retractor. Right sacro-spinous ligament was identified digitally, and two Polydioxanone (PDS) sutures were taken in the substance of the ligament 2 cm medial to the ischial spine with the help of a Capio device (Boston Scientific, Natick, MA, USA) or I stitch (American Medical Systems, Minnetonka, MN, USA) with Polypropylene (size 1) sutures. These sutures were passed through the posterior cervix with the help of Mayo needle as pulley sutures. Concomitant anterior or posterior repair and incontinence surgery (TVT, TVT-O) was done where necologists. Unilateral SSHP was conducted by incising posterior vaginal epithelium in midline up to about 2 cm below the posterior cervical lip. Sharp dissection was done from underlying tissues. Dissection continued para rectally sharply and bluntly to reach right ischial spine. Tissues were retracted away with the help of Breisky vaginal retractor. Right sacro-spinous ligament was identified digitally, and two Polydioxanone (PDS) sutures were taken in the substance of the ligament 2 cm medial to the ischial spine with the help of a Capio device (Boston Scientific, Natick, MA, USA) or I stitch (American Medical Systems, Minnetonka, MN, USA) with Polypropylene (size 1) sutures. These sutures were passed through the posterior cervix with the help of Mayo needle as pulley sutures. Concomitant anterior or posterior repair and incontinence surgery (TVT, TVT-O) was done where necessary. Finally, the pulley sutures were tied, after other repairs, whereby elevating the cervix above the levator plate.

Vaginal hysterectomy with utero-sacral suspension was performed in the standard fashion; utero-sacral suspension was done using one no. 1 PDS suture brought through the posterior vaginal wall, then taking a bite in the ipsilateral uterosacral ligament, as high as possible, then through the other site, and finally coming out through the posterior vagina. This is tied only after closing the vaginal cuff and repairs of other vaginal walls, lifting the vault above the levator plate. Concomitant prolapse repairs were done by plicating pubocervical or rectovaginal fascia with absorbable polyglactin (size 2-0) sutures and the incision was closed with continuous sutures using polyglactin. Incontinence surgeries were also performed where deemed necessary. Cystoscopy was done to check the integrity of the bladder and to visualize ureteric jets.

Pre-operative multichannel urodynamic studies were performed in all women with prolapse reduction to determine evidence of urodynamic stress incontinence or occult stress urinary incontinence. Women with confirmed urodynamic stress incontinence or occult stress incontinence had placement of a transvaginal mid-urethral polypropylene sling; transobturator tape (TOT) or Retro pubic Tension free Vaginal tape (Gynecare TVT, Ethicon US, LLC, Somerville, NJ, USA). All patients received prophylactic single dose antibiotic (intravenous Cefazolin 1–2 g) 30 min before surgery.

Postoperative thromboprophylaxis was given according to hospital policy. Foley catheter was removed at 4 or 24 h after surgery according to surgeon’s preferences.

2.4. Measurements

The following data were collected: demographic characteristics including age, BMI and parity, physical examination including urogynecologic assessment, and prolapse staging using pelvic organ prolapse quantification (POP-Q) system. Moreover, the following variables were recorded: perioperative and postoperative complications, objective anatomical success, recurrence and compartment of prolapse. Pelvic organ prolapse was assessed in the supine position at rest and at maximal strain/coughing. Pap smears were taken for all women on an initial assessment if there were not any in the previous 3 years. All women chose the type of procedure after having proper counseling of risk/benefits and expectations in the light of available evidence. Most recent postoperative exam data were analyzed for recurrences. Recurrence is defined as stage 2 or more on the POP-Q system.

2.5. Statistical analysis

Means, median, and standard deviations were computed for continuous variables and frequencies with percentages for categorical variables. Statistical comparisons were performed with subgroups of patients using the $\chi^2$ test (or Fisher’s exact test) and the unpaired $t$-test (or Mann–Whitney $U$-test) as indicated. Multivariate analysis was based on logistic regression techniques to model the log transform of the odds of recurrence/objective anatomical success as a function of procedure type adjusting for confounders as age, parity and follow up. In all analyses, statistical significance was achieved for $P < 0.05$. Analyses were conducted using SPSS version 22.

3. RESULTS

A total of 50 patients were identified fulfilling our inclusion criteria (26 cases of VH/USS and 24 cases of SSHP). Table 1 shows the demographic characteristics of the study population. The mean age of women who underwent VH/USS was 8.41 years older than the mean age of women who experienced SSHP (56.6 years, range: 42–77 vs 48.2 years, range: 38–63; respectively $P = 0.001$).

When women were grouped into two categories according to two age groups (≤50 years old or >50 years old). Younger women (16; 66%) were found to be more likely ($P = 0.046$) to undergo SSHP than VH/USS (9; 34%). There was no significant difference between SSHP and VH/USS groups in terms of BMI ($P = 0.881$) or parity ($P = 0.304$). The majority of women in both groups had five and more deliveries at baseline (mean parity 6 and 7 in SSHP and VH/USS group, respectively) showing the increased risk of developing uterine prolapse after multiple deliveries.
Pre-operatively, anterior prolapse of stage 2 or more was seen in 13 (54.2%) and posterior prolapse in 14 (58.3%) SSHP cases, compared to 18 (69.2%) anterior and 21 (80.8%) posterior in cases of VH/USS procedure. Concomitant anterior repairs totaled six (25%), posterior repairs totaled five (20.8%) and both anterior and posterior repairs together were 13 (54.2%) in the SSHP group, along with 19 (79.2%) mid-urethral slings; whereas VH/USS group had anterior repairs totaled two (7.7%), posterior repairs totaled seven (26.9%) and both 17 (65.4%), along with 21 (81%) slings.

The mean follow-up time was 25.5 months (range, 1–36) in SSHP group, and 13.9 months (range, 1–25.5) in VH/USS group. No serious intraoperative complications were observed in either group. One case of non-fatal pulmonary embolism (3.8%) and one case of ureter kinking (3.8%) that only required stent placement were observed in the VH/USS group. Two cases (8.3%) required stitches removal in the SSHP group, one of them due to persistent buttock pain, right side labial and perineal numbness and the other one due to vaginal pain.

Table 2 shows the objective anatomical success in patients who underwent VH/USS and SSHP procedures. VH/USS procedure was significantly more successful than SSHP procedure (84.62% [22/26] vs. 41.67% [10/24]; P = 0.0028).

Table 2 shows the number of uterine prolapse recurrences reported by women after SSHP and VH/USS procedures. There were no significant differences between the two groups in terms of central and posterior prolapses (P = 0.324 and P = 0.409, respectively). In contrast, there was a significantly higher anterior prolapse recurrence with SSHP procedure than with VH/USS procedure (33.3% [8/24] vs. 7.7% [2/26]; P = 0.034).

Multivariate logistic analysis adjusting for potential confounders (age, BMI, parity and follow-up duration) showed that SSHP was associated with an 18-fold increase in the risk of anterior prolapse recurrence (OR: 18.2; 95% CI: 2.4–316.5; P = 0.0155; Fig. 1).

4. Discussion

The findings of this retrospective, single-center study indicate that SSHP appears to be associated with less anatomical objective success and an increased risk of recurrent anterior prolapse in comparison to VH/USS. The former association retained its statistical significance after adjustment for potential confounders including age, parity, and BMI. Our study also showed that younger women were more likely to undergo SSHP, perhaps to retain their fertility. In their study by Romanzi and Tyagi,12 women in the hysterectomy group were older and heavier than the women in the utero-sacral hysteropexy group. Women want to preserve their uterus for fertility or gender identity, while SSHP may additionally reduce operative time, estimated blood loss and postoperative recovery time.

The other parameters (BMI and parity) were comparable between the two procedures groups at baseline, and they did not affect the outcomes of the procedures in terms of anatomical success and recurrence of prolapse. Although the duration of the follow-up period in the VH/USS was longer than in the SSHP group, this variable was not associated with objective anatomical success and recurrence of prolapse in multivariate logistic regression analyses.

Objective anatomical success was significantly greater in VH/USS patients than in SSHP patients, in contrast to previous comparative studies that showed no significant anatomical differences between the two groups.7–9 A multicenter randomized controlled study on 66 women showed favorable outcome in the hysterectomy group, with more apical recurrences observed in the SSHP than the hysterectomy group.10 These discrepant findings may be attributed to heterogeneity among the studied women, variable definitions of failure and potential differences in the concerned compartment in which failure was described.11 In some studies, women with preoperative stage 3 or 4 were not included,4,9 since this was considered a risk for surgical failure.13 Lin et al. described high association between recurrent prolapse (75%) and preoperative stage 3 or 4 prolapse.14 In our study 12% (three cases) in the SSHP group had stage 3 or 4 preoperative uterine prolapsed, which may have contributed to the higher failure rate in SSHP.

In parallel, recurrence of anterior prolapse was significantly more prevalent in the SSHP than in the VH/USS

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procedure. We observed that SSHP was associated with an 18-fold increase in the risk of recurrence of anterior vaginal prolapse. Anterior recurrence is a well-documented complication of SSHP in previous studies. More specifically, Paraiso et al. reported 37% cystocele formation after sacrospinous colpopexy that is comparable to our results.15 Similarly, Dietz et al. reported 30% recurrent cystocele following SSHP procedure.4 This high recurrence could be explained by the deviation in vaginal axis caused by unilateral stitch placement or due to damage to neurovascular support.16 Non-placement of anterior mesh is another risk factor13 and a Cochrane review proposed that use of mesh or graft at anterior colporaphy may reduce the risk of anterior prolapse.17 Six of our women in the SSHP group with recurrent cystocele had concomitant anterior repair and cannot be considered as de novo cystoceles. The majority of these women were asymptomatic, and only one woman had stage 3 cystocele that was asymptomatic. Consequently, repeat anterior repair surgery was not performed in any woman.

We found no significant differences between the two groups in terms of central and posterior prolapse. Furthermore, there were no apical recurrences in the hysterectomy group during a mean follow-up period of 25 months. This observation is in line with the reported incidence of apical failure following VH/USS (0–12%) and SSHP (0–15%).18

We observed two postoperative complications in SSHP. The first was due to persistent buttock pain and right side labial perineal numbness, and the second was due to persistent vaginal pain. Persistent buttock and vaginal pain were documented in 10–15% of patients undergoing SSHP in previous series.19 The pain was explained by an injury of surrounding nerves of the sacral plexus and variation in the branches of the pudendal nerve, one of the branches piercing the ligament.20 In most of the cases, these complications resolved spontaneously within 2 weeks and could be treated with analgesics,4 but in our current study, they required stitch removal as pain persisted longer than 3 months and women wanted to remove the SSHP stitches.

Certain limitations of the present report need to be acknowledged including the moderate sample size as well as a retrospective and nonrandomized design. Consequently, we cannot provide definitive data about which surgery is the optimal procedure for the management of uterine prolapse. Moreover, the technique used in SSHP was a unilateral sacrospinous fixation. However, it could be argued that a bilateral fixation might have improved results, yet it remains unclear whether it could have given better outcomes or might have been associated with more postoperative complications and buttock pain.2

5. CONCLUSION

Our retrospective, short-term outcome, single-center study showed that SSHP appears to be associated with less anatomical objective success and an increased risk of recurrent anterior prolapse in comparison to VH/USS. Further validation of our observations by independent investigators in prospective observational or optimally in randomized-controlled settings is required.
Ethics statement
IRB approval was obtained prior to data collection (13-084; Exempt, May 12, 2013).

Disclosure
The authors declare no conflict of interest.

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