

Original article

Rolled Vaginal Wall Flap for The Treatment of Stress Urinary Incontinence

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ABSTRACT

Objectives: Anterior vaginal wall slings (AVWS) have been used for decades in the treatment of female stress urinary incontinence (SUI). The main drawback of using the vaginal wall as a sling is its tendency to weaken and stretch over the course of years. The use of synthetic tapes for the treatment of SUI is effective but costly. For patients who cannot afford synthetic tapes, we describe the preliminary results of a modified AVWS technique for the treatment of SUI types II and III.

Patients and Methods: In this series, a modification of the AVWS was applied in 35 female patients with SUI. A fortified and rolled flap is used to provide compression and support of the urethra. The vaginal mucosal surface of the flap is cauterized and two diagonal sutures are placed across it. The flap is then rolled on itself with a running 2/0 vicryl suture. Two sutures attached to both ends are passed retropubically to the anterior abdominal wall and tied over the rectus sheath.

Results: All 35 female patients had type II/III SUI. After a median follow up of 43 months, 91% of the patients were dry or used 0-1 pad per day. Only one patient suffered from transient retention for one week post-operatively.

Conclusion: This is a simple method to reinforce vaginal wall flaps. It could offer a durable and effective option for the treatment of SUI in patients who can not afford synthetic tapes. Long-term follow up is required to evaluate the durability of the procedure.

Key Words: Stress urinary incontinence, vaginal wall, sling

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INTRODUCTION

Anterior vaginal wall sling (AVWS) has been used for decades in the treatment of stress urinary incontinence (SUI). Initially, pubovaginal slings using autologous fascia, either rectus fascia or fascia lata, were the gold standard treatment of SUI. In an effort to reduce the morbidity and discomfort associated with fascial harvesting, synthetic tapes placed by a retropubic or transobturator route were developed and have been applied successfully for over a decade. They offer ease of availability, simplicity and high long term effectiveness¹. Nowadays, they are the most favorable method of treatment of SUI.

Tension free vaginal tape (TVT) and transobturator tape (TOT) procedures may have an acceptable rate of complications such as infection, organ injuries and erosion, but they are costly. Patients with SUI and limited financial resources may still prefer autologous materials for sling surgery to avoid the cost of modern tapes. It is our aim to modify and improve traditional procedures such as AVWS to offer these patients an effective and durable alternative to the successful modern tapes.

The AVWS procedure was described by Raz et al. in 1989². This technique uses

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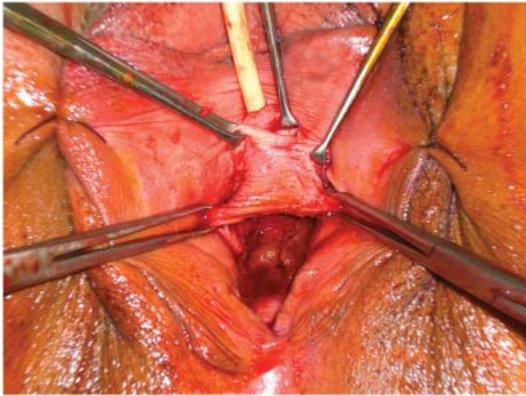


Fig. 1: A rectangle of anterior vaginal wall skin that will be used as a sling is freed from all attachments.

in situ vaginal wall over the bladder neck and proximal urethra as the sling material. It avoids the morbidity of autologous fascial harvesting, does not have an increased rate of infection or erosion and is available at no cost. The advantages are its simplicity, need for only a small incision, short operative time and hospital stay and reliance on healthy, well vascularized in situ tissue.

Various modifications of Raz's original technique have been introduced, but the concept of an in situ patch of tissue functioning as a backboard beneath the bladder neck and proximal urethra remains the same³. In patients with type III SUI, a higher degree of tension is required to offer the patient better results. The procedure is not appropriate in women with significant intrinsic sphincter deficiency (ISD), history of prior vaginal surgery with significant scarring and postmenopausal women with very atrophic vaginal skin³.

The main drawback of using the vaginal wall as a sling is its tendency to weaken and stretch over time. In this series, a modification of the AVWS was tested. The aim of this modification was to reinforce the vaginal wall flap and prevent its laxity over time for the treatment of SUI due either to urethral hypermobility or ISD.

PATIENTS AND METHODS

The procedure was performed on 35 female patients with SUI type II and III presen-



Fig. 2: Two diagonal rows of 0 polypropylene sutures are taken through the flap to fortify the vaginal flap and make it less stretchable.

ting to the department of Urology, Faculty of Medicine, Alexandria main hospital. Preoperative evaluation included history, voiding diary, physical examination, stress test, Q-tip test, pad count and urodynamic study in the form of filling cystometry with evaluation of Valsalva leak point pressure (VLPP). Patients with hypermobility and/or VLPP > 60 cm/H₂O were defined as type II SUI, while those with VLPP < 60 cm/H₂O were defined as type III SUI.

The patients had a median parity of 3.4. Eleven patients (31%) were menopausal and 8 patients (23%) had a history of previous vaginal surgery. Outcome measures included operative data, complications, operating time, length of urethral catheterization and length of hospitalization. Only patients who completed at least two years of follow up were included in the study. Postoperative evaluation was done by the operator himself. It included both objective and subjective evaluation. This includes stress test, evaluation of incontinence secondary to stress or detrusor instability, number of pads used, filling cystometry and evaluation of VLPP.

Surgical technique: After appropriate anesthesia has been achieved, the patient is placed in a modified dorsal lithotomy position. Labial retraction sutures, a weighted vaginal speculum and a Foley catheter are placed. A rectangle of anterior vaginal wall skin that will be used as a sling is freed from all attachments, but left completely in situ (Fig. 1). Using first sharp and then blunt

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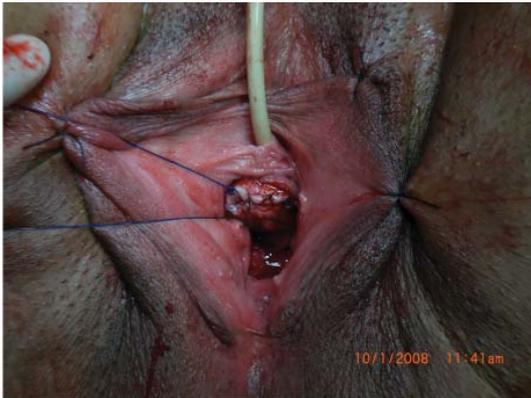


Fig. 3: The flap is then rolled on itself and suspended by two sutures attached to both ends.

dissection, the lateral spaces are dissected. The surface of the vaginal flap is cauterized using diathermy in order to reinforce the flap. Two diagonal rows of 0 polypropylene sutures are taken through the flap to further fortify the vaginal flap and make it less stretchable. Two 1-cm transverse incisions are made one fingerbreadth above the pubis on both sides of the mid line. The flap is then rolled on itself (Fig. 2) and suspended by two threads attached to both its ends, then passed on a ligature carrier to the suprapubic area and tied together over the rectus fascia. More tension is used in patients with VLPP < 60 cm/H₂O. This is guided by the Q-tip test intra operatively. The vaginal wall is closed with a running, locking 2-0 polyglactin suture. A vaginal packing impregnated with antibiotic ointment is placed.

RESULTS

Thirty five women aged 28 to 64 years (mean age 45.3) underwent the vaginally reinforced sling for SUI. Of these patients 25 (71%) presented with urethral hypermobility and the remaining 10 (29%) had ISD, either alone or combined with urethral hypermobility. Preoperatively, all patients had a positive standing stress test and 30 patients had urethral hypermobility. On urodynamics, all patients had absence of involuntary detrusor contractions on subtracted cystometry. Filling cystometry revealed VLPP >60 cm/H₂O in 25 patients and <60 cm/H₂O in the other 10 patients.

Operating time ranged between 26 and 43 minutes (mean 32.8). There were no major intraoperative, perioperative or postoperative complications. All patients were discharged after 24 hours after removal of the catheter. Only 1 patient had postoperative retention, was discharged with the catheter and successfully voided after 10 days. Vaginal infection was detected in 3 patients and successfully managed.

Thirty-three patients were available after a median follow up of 43 months (range 25 to 49). Twenty-nine patients (88 %) were continent or used 0-1 pad per day. The objective success rate for type II SUI was 91 % while the success rate was 80% for type III SUI and mixed type II and III SUI. Most of the failures were detected in the first year of follow up. They were offered alternative antiincontinence surgical procedures.

DISCUSSION

The role of health care providers is to maintain a wide variety of procedures that suit all kinds of patients. Midurethral synthetic tapes offer a simple, successful and minimally invasive procedure for the treatment of SUI, but their cost remains a barrier to their widespread use. Tapes are expensive, especially for patients in third world countries such as Egypt. On the other hand, serious complications with the use of tapes, such as bowel perforation, retropubic hematoma, venous injury, bladder perforation and urethral erosion, have been reported in the literature^{4,5}. Low cost, reasonable effectiveness and low incidence of urethral or bladder erosion are the most important potential advantages of the AVWS technique. Our aim was to revive the AVWS procedure and offer a better reinforcement of the vaginal flap to improve its long term efficacy.

Since the AVWS was introduced in 1989, the reported success rates ranged from a high of 100% to a low of 61% (subjective cure). The majority of authors reported success in 70–95% of patients. Some of the differences in the reported outcomes may

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be due to variations in the definition of success^{6,7}. Women with significant ISD may not be ideal candidates for an AVWS. In this study, patients with type III SUI had a lower success rate. A number of studies that reviewed outcomes in women after an AVWS showed a trend toward higher failure rates in patients with lower VLPP. Several studies noted this and based on these findings women with a VLPP <60 cm/ H₂O may do better with a fascial or other type of sling⁸⁻¹⁰. Nonetheless, using a higher degree of AVWS tension guided by the Q-tip test may improve the success rate in such patients.

Some authors noted a trend toward late recurrence of SIU in patients with ISD¹¹. A number of reports support the concept that patients with a lower VLPP (<50 cmH₂O) and more significant ISD have a worse outcome than those with a higher VLPP¹⁰. In contrast, Kaplan et al. found no difference in outcome between patients with ISD (VLPP <60 cmH₂O) and those with anatomic incontinence (VLPP >60 cmH₂O)¹². Their findings are clearly different from those of the aforementioned groups and this difference is difficult to explain.

Rodrigues et al. noted shorter duration of efficacy in vaginal wall sling operations. They observed that the AVWS group started to lose efficacy after 6 months¹³. Also, Metin et al. observed a yearly trend of decrease in efficacy with vaginal wall slings¹⁴. The failure rates were found to be 16% after 3 years follow up, 23% after 4 years follow up and 30% after 5 years follow up. Mikhail et al. reported that the overall success rate after 4 years of follow up was 91%¹⁵. They stated that the modified vaginal wall patch sling technique appears to have a good long term success rate with low operative morbidity and minimal postoperative voiding dysfunction.

The modifications of the vaginal wall sling in our work include fortification of the vaginal island flap by polypropylene sutures in diagonal fashion to provide extra support and to prevent laxity of the flap. Also, cauterization of the surface of the

vaginal flap and rolling of the flap improve and strengthen the layer of vaginal wall support. This will make vaginal wall support less elastic and hence less stretchable.

The limitations of this study are the small patient cohort and the moderate duration of follow up (mean three and a half years). However, the preliminary results indicate that the strengthened AVWS is highly effective, durable and safe for both types of SUI over a medium term follow up. Longer follow up is required to establish the long term durability of this procedure. A randomized study comparing the efficacy of the modified AVWS and modern tapes is required.

CONCLUSIONS

The rolled, reinforced AVWS seems to be both effective and durable. It gives additional support to the urethral hammock and offers a cheap solution to SUI for those who can not afford synthetic tapes. The technique is a straightforward, minimally invasive procedure for the treatment of female SUI. It minimizes patient morbidity and avoids some of the potential problems associated with the use of synthetic materials. Longer follow up in a larger patient cohort is needed before a final conclusion can be drawn.

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