

A SIMPLE SURGICAL TECHNIQUE TO MINIMIZE POSTOPERATIVE URINARY RETENTION WITH A PUBOVAGINAL SLING

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ABSTRACT

Purpose: Suburethral sling surgery has traditionally been associated with a high incidence of permanent urinary retention. We describe a method of pubovaginal sling placement that limits permanent postoperative urinary retention and restores continence.

Material and Methods: A total of 100 women with clinically proven stress urinary incontinence who received a suburethral pubovaginal sling were reviewed retrospectively. Each patient had an autologous abdominis rectus fascia pubovaginal sling placed by the identical technique of adjusting tension by tying over an inverted Kelly surgical clamp with the operative table in a 20° reverse Trendelenburg position. Emphasis of chart review was on rate of surgical success and incidence of permanent postoperative urinary retention.

Results: Ninety-eight of the women were continent of urine. No patient suffered from permanent urinary retention.

Conclusions: This method provides a simple way of placing a suburethral sling that limits permanent urinary retention and still achieves good surgical results.

Key words: urinary incontinence; female; prostheses and implants; urination disorders

Braz J Urol, 27: 275-280, 2001

INTRODUCTION

The suburethral sling procedure may be among the most durable of all forms of surgical treatment for stress urinary incontinence (SUI) (1-5).

Despite increased acceptance of suburethral sling procedures, the technical aspect of intraoperative adjustment of sling tension remains unclear. The goal of the standard suburethral sling procedure is to cure urinary incontinence without inducing unwanted outflow obstruction. To achieve this result, different technical methods of adjusting the sling tension have been suggested: cystoscopic appearance, urodynamic variables, or ultrasonography (5-8). Others have been based on simplified trigonometric analysis using the cystoscope sheath or cotton swab angle (9-11).

We present a simple method of suburethral sling placement not dependent on radiographic or cystoscopic visualization or rotational adjustment.

MATERIAL AND METHODS

Patients

Between January 1995 and May 1998, 100 consecutive women with SUI underwent a pubovaginal sling procedure with autologous rectus abdominis fascia by one of two surgeons using the identical technique. The patients' hospital charts, urodynamic tests, and clinical records were reviewed retrospectively.

Preoperative evaluation included a urologic-based history and physical examination, urinalysis, videourodynamic studies, and, when indicated, cystourethroscopy. Urethral mobility was assessed by fluoroscopic visualization of the urethra with maximal straining and 200 ml of 20% iodinated contrast medium in the bladder. Patients' incontinence was classified urodynamically in a previously described manner (12): urethral hypermobility if the abdominal leak point pressure was greater than 90

cm H₂O, intrinsic sphincter deficiency if the abdominal leak point pressure was less than 60 cm H₂O, and a combination of the two if the abdominal leak point pressure was between 60 and 90 cm H₂O.

Postoperatively, several clinical variables were assessed. The first was whether the patients were continent of urine. Continence was defined by the combination of patient perception, no pad usage, and no visualized leakage per urethra while the patient strained with 200 ml of isotonic saline in the bladder. The second was whether they had urinary retention. This was defined by inability to void for more than 30 days from the placement of the suburethral sling. The third was the determination of the presence of postoperative urgency.

Surgical Technique

All patients underwent a modified pubovaginal suburethral sling procedure utilizing a Cobb-Ragde needle (13). With this technique, a 2 x 10-cm rectus fascial strip is harvested from the anterior rectus sheath. Each end of the sling is oversewn with a number one blue monofilament polypropylene suture, which will act as the sling-suspending suture (Figure-1). The harvest site is closed with a running number one violet monofilament polydioxanone suture. Standard transvaginal dissection through an inverted U incision allows access to the retropubic space. A Cobb-Ragde needle is passed from an intact region of the anterior rectus fascia, at least 2 to 3 cm inferior to the harvest site, under digital con-

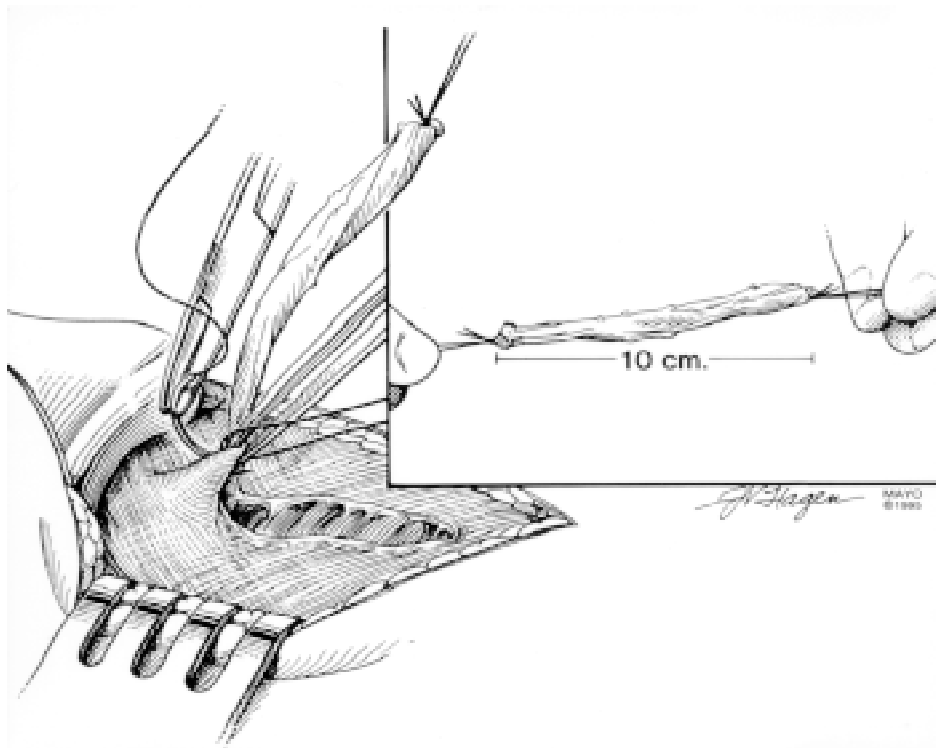


Figure 1 - A 10 x 2-cm anterior rectus fascial strip is harvested (by permission of Mayo Foundation).

trol through the retropubic space and out through the vaginal incision. The sling sutures are threaded and transferred suprapubically and then elevated to remove all slack (Figures-2 and 3). The sling is positioned just distal to the bladder neck. To prevent twisting, the sling is sutured in place to the periurethral fascia with 4-0 Vicryl. Indigo carmine is ad-

ministered intravenously and cystourethroscopy is done to ensure that no suture material has violated the bladder and to document bilateral blue-tinged ureteral efflux (14). A suprapubic tube is placed with standard technique. After cystoscopy, a 16F Foley catheter is reinserted. The weighted vaginal retractor previously placed is removed. The patient is

placed in 20° reverse Trendelenburg position (Figure-4). The ipsilateral sling-suspending sutures are now tied over an inverted 10-inch Kelly clamp (the convex side), yielding an approximately 1-cm air knot (Figure-5). The bilateral sutures are tied to each other over the midline in a loose loop. Surgical closure is now completed.

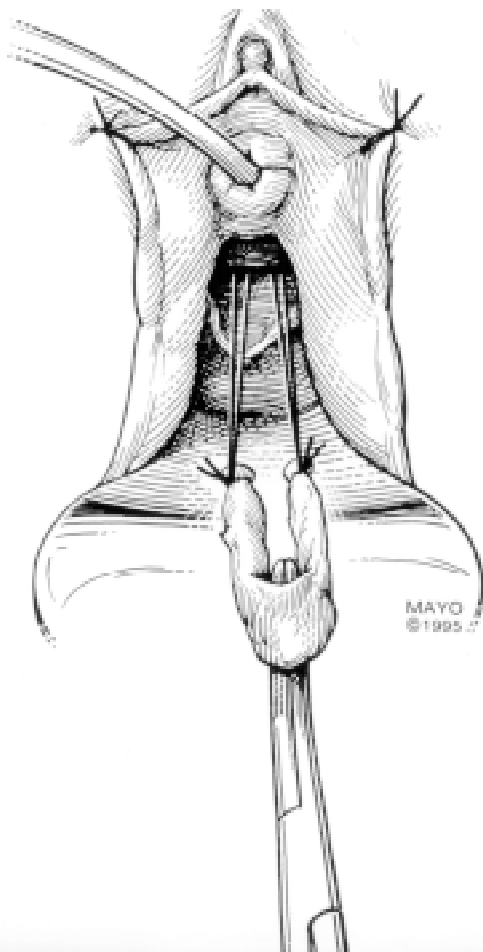


Figure 2 - The sling is appropriately positioned (by permission of Mayo Foundation).

With this technique, once the Kelly clamp is removed, there is no tension on the suspending sutures because of the air knot. Cystoscopy is not performed to confirm urethral wall coaptation. The procedure is performed in the same fashion for patients with urethral hypermobility and for those with intrinsic sphincter deficiency, including stovpipe urethra.

The urethral catheter is removed on the first postoperative day, and the suprapubic tube is plugged.

The patients begin their voiding trial and measure postvoid residuals via the suprapubic tube after each void. The suprapubic tube is removed once the postvoid residual is consistently less than 100 ml.

Follow-up

Follow-up in these 100 patients ranged from 4 to 36 months (mean, 6.3 months). Face-to-face interviews with the patients, telephone interviews, and chart review were done.

RESULTS

Preoperative evaluation determined that 55 patients had urinary incontinence secondary to urethral hypermobility, 21 had urinary incontinence due to intrinsic sphincter deficiency, and 24 had both.

Concomitant procedures performed with the pubovaginal sling in the 100 patients included: anterior repair (6), posterior repair (3), anterior and posterior repair (2), vaginal hysterectomy (1), transurethral resection of bladder tumor (1), urethral diverticulectomy (1), abdominal panniculectomy (1), urethrovesical fistulectomy (1), and pelvic lipoma resection (1).

The operative procedure was well tolerated by all the patients; no patients required transfusion or experienced any medical or surgical complications.

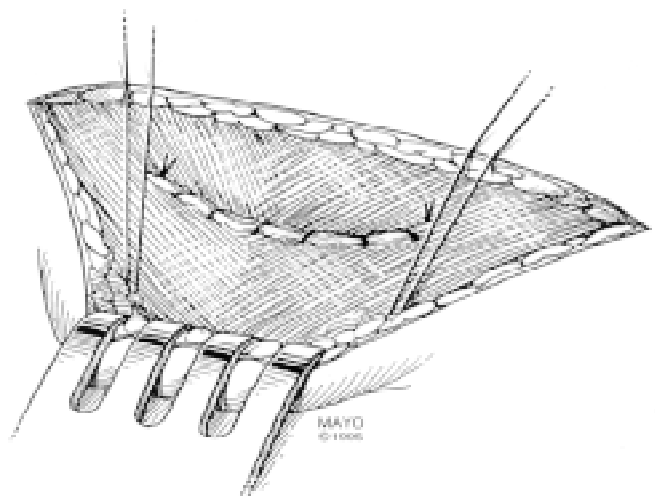


Figure 3 - Sling suspension sutures are brought through the anterior rectus fascia (by permission of Mayo Foundation).

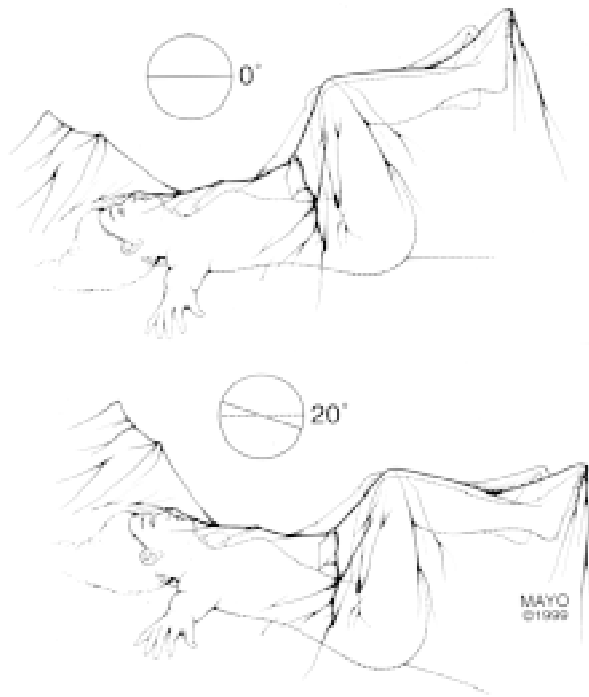


Figure 4 - The patient is placed in a 20° reverse Trendelenburg position (by permission of Mayo Foundation).

The suprapubic tube was removed within 4 weeks after operation in all patients. Actual date of removal depended on the combination of acceptable residuals and when the patient could come to the clinic.

Of the 100 patients, 98 had no postoperative SUI. Both failures were reevaluated with videourodynamics. The first patient had urethral hypermobility preoperatively and had a pubovaginal sling only. Postoperative urodynamics revealed a decline of her Valsalva leak point pressure from 126 to 86 cm H₂O. On fluoroscopic imaging, her bladder neck and urethra revealed increased mobility as well as leakage of contrast medium consistent with new-onset intrinsic sphincter deficiency. The second patient also had urethral hypermobility preoperatively and had a pubovaginal sling only. Her postoperative urodynamics showed an increase of her Valsalva leak point pressure from 127 cm H₂O to 135 cm H₂O. On fluoroscopy with stress maneuvers, her urethra no longer had any hypermobility but she did have leakage per urethra of contrast medium. There were no patients with permanent urinary retention.

Seven of the 100 patients had new-onset urgency after operation. Four manifested the urgency symptoms immediately after operation, and three presented with the symptoms more than 1 year after the procedure. Patients with de novo urgency underwent evaluation, including repeat assessment of postvoid residual and urethral sounding to eliminate the possibility of any undue tethering and videourodynamics when indicated. Average postvoid residual in the new-onset urgency group was 60 ml (range, 20-100 ml). No objective evidence of outflow obstruction was found, and none of the patients underwent a later urethrolisis.

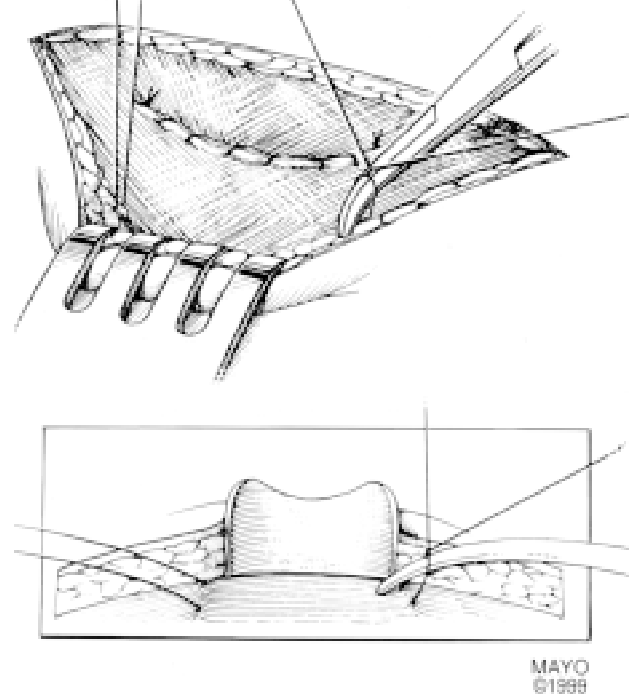


Figure 5 - Sutures are tied, leaving a 1-cm air knot (by permission of Mayo Foundation).

DISCUSSION

An active debate continues over the optimal sling tension that produces urinary continence but avoids permanent urinary retention. Urinary retention is a well-known potential complication of suburethral sling surgery (1). Our technique is simple and has yielded excellent results with regard to continence and retention. The rate of new-onset urgency compares well with other studies (1,12). The association and causes of urgency after anti-incontinence proce-

dures have been discussed in the literature and are not within the scope of this report (1,9,12); nevertheless, a technique that minimizes permanent urinary retention may reduce partial obstruction as well. This approach removes any emotionality from determination of sling tension and is devoid of the need for any intellectual exercise or special equipment during that portion of the surgery. Placement of the patient in the reverse Trendelenburg position shifts the abdominal contents into a more dependent position in the pelvis and may limit the potential inadvertent oversupport of the urethra by the sling. Cystoscope rotation has provided a method of determining intraoperative sling tension with good results, but it does add an operative step, with the need for urethral angle assessment, and a measure of subjectivity.

It would be difficult to tie the sutures any more loosely than with this method, yet there was minimal postoperative SUI. We did not alter surgical methods for urethral hypermobility and intrinsic sphincter deficiency and still were successful. The proximal urethral pressures after a suburethral sling have been reported to be approximately 10 cm H₂O (15), with the sling increasing the closing pressure in the urethra just beneath the sling by only 5 to 6 cm H₂O (16). Perhaps this amount of suburethral sling support can be achieved by just removing the slack from the suspension sutures, and this is truly all the tension that is needed.

CONCLUSION

This method of adjusting sling tension should be considered secondary to its ease of performance while providing acceptable surgical results. It allows the surgeon to place the sling with no undue tension in a reproducible and satisfactory fashion.

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Received: July 28, 2000

Accepted after revision: March 30, 2001

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