Comparison of Laparoscopic Burch and Tension-Free Vaginal Tape in Treating Stress Urinary Incontinence in Obese Patients

Maurice K. Chung, RPh, MD, Rosemary P. Chung, BSN, PA-C

ABSTRACT

Objective: To compare the efficacy and safety of the tension-free vaginal tape (TVT) and laparoscopic Burch procedures in treating genuine stress urinary incontinence in obese patients.

Methods: This was a retrospective evaluation of 91 consecutive cases of TVT alone or TVT combined with other procedures from April 1999 through March 2000 and 51 consecutive cases of the laparoscopic Burch procedure from January 1998 through February 1999. All procedures were performed in a private practice and community hospitals in the midwest. One hundred forty-two women (ages 34 to 79) with stress urinary incontinence documented by clinical examination and preoperative cystometric and urodynamic evaluation were included in the study. They were also divided into 5 groups based on their body mass index (BMI): NL (normal-BMI < 25), OW (overweight-BMI 25 to 29), OBI (obesity I-BMI 30 to 34), OBIi (obesity II-BMI 35 to 39), OBIii (obesity III-BMI > 40). In the TVT group, 66% were obese (OBI-21, OBIi-17, OBIii-22) versus 36% in the laparoscopic Burch (OBI-13, OBIi-5) group.

Results: All TVT patients remain cured or symptoms improved in their genuine stress urinary incontinence, which favorably compares with the laparoscopic Burch procedure after 1 year. Operating time for the TVT portion ranged from 18 to 40 minutes. The laparoscopic Burch procedure in general took over 1 hour. No bladder, bowel, or vascular injuries have occurred in the TVT group. Superficial suprapubic ecchymoses have occurred in the TVT group occasionally but required no interven-

INTRODUCTION

Urinary incontinence affects more than 25 million American women.1 Currently, more than 100 different surgical procedures are available to treat this disorder. The 2 most common procedures are the pubovaginal sling and retro-urethropexies, such as the Marshall-Marchetti-Krantz (MMK) and Burch procedures. These techniques have a success rate of over 80% regardless of whether they are open2 or laparoscopic.2-4 Obesity increases not only the operative complications but also the postoperative failure rate. Numerous articles have been published about obesity as both a cause of stress urinary incontinence and postsurgical failure.5-10 Tension-free vaginal tape (TVT) is a relatively new, minimally invasive procedure for treating genuine stress urinary incontinence. Although the reports have been uniformly positive with a success rate averaging 90%,11-26 currently, no data are available concerning the procedure in obese women. We studied the effectiveness and complications of laparoscopic Burch and TVT procedures in the obese female in a private midwestern community hospital setting.
METHODS

We studied 51 consecutive cases of the laparoscopic Burch procedure from January 1, 1998 through February 28, 1999. We also studied 91 consecutive cases of the TVT procedure in women, aged 34 to 79, during the 12 months between April 1, 1999 and March 31, 2000. These women had documented urinary stress incontinence and underwent a TVT, either as a separate procedure (44 patients) or combined with another procedure (47 patients).

In the laparoscopic Burch group, 17 patients had the Burch procedure done alone, and 34 patients had combined procedures. In the TVT group, 41 patients underwent the TVT only, and 47 patients had combined procedures.

All patients had a preoperative history and physical examination, including a Bonnie Marshall Miyasaki test to detect accompanying paravaginal defects, a cotton-tipped swab test to detect urethral hypermobility, and supine and standing Valsalva maneuvers to diagnose genuine stress incontinence. Other laboratory testing included urinalysis, fasting blood glucose, 2-hour postprandial glucose, and a TSH to rule out any underlying diseases that may be associated with urinary incontinence.

Cystometric and urodynamic procedures were performed in all patients. The majority of the patients had some form of urinary urgency and frequency consistent with an overactive bladder. In the Burch group, all of the patients had genuine stress urinary incontinence. Patients with intrinsic sphincter deficiency (ISD) were excluded. The Bonnie Marshall Miyasaki tests were done and were able to stop the leakage of urine as the patients were performing a Valsalva maneuver. Any patients that failed the Bonnie Marshall Miyasaki test with detrusor instability only, were excluded. In the TVT group, 24 patients (25%) were diagnosed with detrusor instability and stress urinary incontinence. Another 26 patients (29%) were diagnosed with stress urinary incontinence with both intrinsic sphincter deficiency and a positive Bonnie Marshall Miyasaki test with urethral hypermobility. These patients were further divided into 5 groups based on their body mass index (BMI) (Table 1).

In the Burch group, about 65% of patients were considered normal or overweight; only 35% of the patients were considered obese. The Obesity I group contained 26% of the study patients, the Obesity II group had 9%, and no patients were in the Obesity III group. However, in the TVT group, 66% of the patients were considered obese, and 43% were in Obesity II-III (Table 2).

Anesthesia

In the Burch group, all patients required general anesthesia. The TVT group, however, had the surgeries performed under either general anesthesia, spinal anesthesia, epidural anesthesia, or local anesthesia with intravenous (IV) sedation. In all cases, a local anesthetic mixture of 30 cc Lidocaine 1% with epinephrine (1-100,000 dilution), 30 cc of Marcaine 1/2% with epinephrine (1-100,000 dilution), and 60 cc of saline were used to form a 1/4% dilution of the anesthetic solution. This was used for hydrodistention, hemostasis, and postoperative analgesia.

Operation

Burch procedures were all performed with the laparoscopic intraperitoneal approach, as this enabled us to evaluate the peritoneal cavity and treat all possible pelvic organ defects. The majority of Burch procedures, in general, required over 1 hour of operative time and were performed the same way as the classical Burch colposuspension. We utilized nonabsorbable O Gore-Tex, Prolene, or Ethibond sutures. We sutured the peri-urethral endopelvic pubocervical fascia to Cooper ligament in a figure eight fashion.

The TVT procedures were performed according to the recommended directions from Gynecare.27 The operative time related to the TVT portion of the surgery ranged from 18 to 40 minutes. In combined procedures, the TVT was always performed last. The tape was set as the patients were waking up from the general anesthesia or when they were able to generate a good cough or Valsalva during regional or local anesthesia.

RESULTS

In the Burch group, 6 patients had slight urinary leakage with a full bladder although their symptoms were much improved. Further investigation suggested they were experiencing a combination of urgency incontinence and not anatomical failure.

One small perforation at the bladder dome occurred due to adhesions as we were dissecting into the space of Retzius, and we repaired it with endoscopic suturing.
Another case with complications was a right urethral occlusion secondary to suture ligature, which was released intraoperatively.

The average length of stay for the Burch procedure was 1.1 days. The urinary catheters were removed by the first postoperative appointment that was the week following the surgery.

At 12 to 24 months follow-up postoperatively, no patients in the TVT group have had a recurrence of the stress component of their urinary incontinence. They do not leak urine with physical stress, such as lifting, jumping, coughing, or sneezing. Some of the patients have demonstrated urgency incontinence, especially those patients diagnosed with detrusor instability preoperatively.

In the TVT group, 37 patients who had urinary frequency and urgency were taking Tolterodine preoperatively, and 29 of these patients remain on Tolterodine postoperatively. Eight of the 37 patients stopped taking Tolterodine because the symptoms of urinary urgency and frequency had improved postoperatively. Another 40 patients had similar symptoms preoperatively for which they did not take any type of anticholinergic. Twenty-eight of them had symptoms disappear or improve significantly. Only 12 of the 40 patients were required to take Tolterodine postoperatively to help with the symptoms of urinary urgency and frequency.

No bladder, bowel, or vascular injuries have occurred related to the TVT procedures. Superficial suprapubic ecchymosis has occurred occasionally, but these minor complications have not required further intervention.

In the TVT group, the length of stay was 1 day with most patients being released on the same day as the procedure. When additional procedures are performed, the patients are usually released the following day. Fifty percent of patients were discharged without an indwelling Foley catheter. Home health nursing visits were scheduled to check postvoid residual urine on postoperative days 1, 4, and 8. The patients were seen in the office 1 week after the procedure, by which time 81 patients (90%) were free of urinary catheters. The remaining patients with urinary retention longer than 1 week all had combined procedures. One patient had urinary retention for 4 months. She performed intermittent self-catheterizations and finally underwent a TVT unilateral tape release. Postoperatively, she has remained continent and has not required further self-catheterization.

### Table 1.
The Burch Group.

| The normal group (BMI < 24) | 7 normal patients | 14% |
|----------------------------|-------------------|-----|
| Overweight group (BMI 25-29) | 26 overweight patients | 50% |
| Obesity I group (BMI 30-34) | 13 obesity I patients | 26% |
| Obesity II group (BMI 35-39) | 5 obesity II patients | 10% |

### Table 2.
The TVT Group.

| The normal group (BMI < 24) | 11 normal patients | 12% |
|----------------------------|-------------------|-----|
| Overweight group (BMI 25-29) | 20 overweight patients | 22% |
| Obesity I group (BMI 30-34) | 21 obesity I patients | 23% |
| Obesity II group (BMI 35-39) | 17 obesity II patients | 19% |
| Obesity III group (BMI > 40) | 22 obesity III patients | 24% |
CONCLUSION

Laparoscopic Burch colposuspension is an excellent minimally invasive procedure. It enables us to treat genuine stress urinary incontinence with a very good success rate.\textsuperscript{2-4} In addition, it allows us to correct the coexisting pelvic organ relaxation and treat pelvic pathology. We have performed over 150 laparoscopic Burch procedures over the last 6 years before the availability of the new TVT technology. We chose the most recent 51 cases because of the availability of the office cystometric-urodynamic testing and standardization. The laparoscopic Burch approach requires general anesthesia, longer operative time, advanced endoscopic surgical skill, and is technically very difficult in obese patients. We offered the procedure mostly to the normal group through the obesity I group (65\%) because we do fear operative failure due to the obesity as reported in previous literature.\textsuperscript{5,8-10} We found that the TVT procedure is extremely successful in controlling urinary stress incontinence regardless of patients’ weight. The procedure also appears to be very effective in patients with ISD in addition to their genuine stress urinary incontinence. Complications like superficial ecchymosis and urinary tract infection are minor. No bladder injuries or any other major complications occur with TVT. The procedure is easily taught to surgeons who are familiar with other retropubic suspension procedures. Forty-three percent of our TVT patients were morbidly or massively obese (OB II and III), whereas the laparoscopic Burch group had only 9 patients in the OB II group and had no massively obese patients. Even skilled surgeons often avoid these patients because of concern about technical difficulties, surgical complications, and postoperative failures.

Traditional open retropubic urethropexies are even more difficult with massively obese patients and carry a high failure rate and more trauma to the patients.\textsuperscript{5,8-10} The pubovaginal sling procedure can be performed to correct stress urinary incontinence in obese patients, but skillful surgeons may still be reluctant to offer the choice due to the patient’s body habitus.\textsuperscript{5,8-10}

We noted that the TVT procedure also helped many of our patients with complaints of urgency and frequency. Of the 40 patients with urgency and frequency who were not on preoperative medication, 28 experienced significant improvement in their symptoms postoperatively. The remaining 12 improved with anticholinergic therapy. Thirty-seven patients were taking anticholinergics prior to surgery. Of those 37 patients, 8 have been able to stop the medication postoperatively.

Therefore, this preliminary study indicates that TVT is a safer, easier, and more effective minimally invasive surgery to perform for genuine stress urinary incontinence regardless of the patient’s BMI and can be favorably compared with the laparoscopic Burch approach, which requires advanced surgical skill. It is very important to select the appropriate surgical continent procedures for the different groups of patients to achieve the best results.\textsuperscript{28}

Based on our study, we believe that the TVT procedure may be the treatment of choice for obese women. It appears to be very effective regardless of the patients’ obesity and is beneficial when the stress incontinence is combined with intrinsic sphincter deficiency. In addition, the TVT procedure appears to improve many women’s symptoms of urgency and frequency.

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