Male Sling Procedures for Stress Urinary Incontinence

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Male stress urinary incontinence (SUI) is a common complication after prostate surgery due to urethral sphincter dysfunction or bladder dysfunction (Cornu et al., 2009; Moul, 2011; Rehder & Gozzi, 2007). It is even more common after a radical prostatectomy (RP), with the incidence varying from 1% after a transurethral resection of the prostate (TURP) to 84% after a RP (Cornu et al., 2009). Other causes of SUI include radiation therapy, any surgery for benign prostatic hypertrophy (BPH), neurological lesions, or trauma.

Incontinence improves with time after radical retropubic prostatectomy (RRP). One year after an RRP, 27% of patients experience incontinence significant enough to wear protection (Augustin et al., 2002). Two years after an RRP, 88% were continent, 8% had stress incontinence, and 2% had significant incontinence requiring four or more pads daily (Maffezzini et al., 2003). Decreased quality of life is common in men who have problems with incontinence following prostate surgery (Augustin et al., 2002; Cornu et al., 2009). They experience embarrassment, social isolation, and depression (Augustin et al., 2002, Robinson, 2000).

Treatments/Background

There are several treatment options for male SUI. Possible treatments include behavioral therapy, pharmacotherapy, periurethral bulking, male incontinence slings, and artificial urinary sphincters (AUS) (Cornu et al., 2009; Moul, 2011). Less invasive measures, such as behavioral modifications, pelvic floor muscle training, penile clamps, pharmacotherapy, periurethral injections of bulking agents, and biofeedback/electrostimulation, are initiated as first steps in treating SUI (Gill et al., 2010). If continence is not achieved through these options, a sling or artificial sphincter may be an alternative.

Male incontinence slings, such as the InVance® Bone Anchor (see Figure 1), the AdVance® Transobturator, bone-anchored.

Key Words: Radical prostatectomy, prostate surgery, male stress urinary incontinence, urethral sphincter dysfunction, bladder dysfunction, urinary sling, men’s health, transobturator, bone-anchored.

Objectives:

1. List treatment options for male stress urinary incontinence.
2. Discuss male slings as an option for male stress urinary incontinence.
3. Describe the different male sling procedures.
4. Identify post-operative complications of the male sling procedure.

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the Virtue®, are newer interventions for male SUI. The authors’ experience extends to the use of the bone-anchor and transobturator slings; thus, the rest of this article will focus only on these two approaches for male sling placement. Advantages of a sling include decreased risk for infection, fewer complications, minimally invasive, and more economical (Bauer et al., 2010; Carmel, Hage, Hanna, Schmutz, & Tu, 2010; Cornel, Elzevier, & Putter, 2010; de Leval & Waltregny, 2008). A urinary sling is an alternative for patients in whom an AUS is contraindicated. Patients who cannot use a mechanical device due to poor hand dexterity or limited mental capacity, or who have incontinence requiring minimal pad use would be potential candidates for male slings (Bauer et al., 2010; Cornu et al., 2009; de Leval & Waltregny, 2008; Gill et al., 2010; Guimarães et al., 2008).

Male slings are not recommended for men who have had prior radiation therapy, radiotherapy, TURP, a history of osteomyelitis, or chronic urinary tract infections (Cornel et al., 2010; de Leval & Waltregny, 2008; Guimarães et al., 2008). Further contraindications include those who have neurogenic SUI, poor bladder storage, osteoporosis, a blood coagulation disorder, a small bladder with low compliance, an overactive bladder, or urinary obstruction problems (Bauer et al., 2009; de Leval & Waltregny, 2008; Guimarães et al., 2008; Rehder & Gozzi, 2007). Patients with these conditions are not ideal candidates for male slings due either to the increased risks for complications or to decreased effectiveness of the procedure. For example, research has determined that patients who have undergone prior radiation therapy or had associated urethral stenosis requiring urethrotomy have no improvement in their SUI after receiving the transobturator sling. This lack of
improvement was hypothesized to be related to reductions in tissue compliance as a result of strictures and radiation-related lesions in the urethra (de Leval & Waltregny, 2008). Further, men who have undergone previous TURP or radiotherapy after RRP have demonstrated limited improvement in incontinence from the transobturator sling (Cornel et al., 2010).

**Procedures**

**Bone-Anchored Procedure**

The bone-anchored male sling is placed during an outpatient surgical procedure. The required operative time for sling placement is usually less than one hour. The patient is placed in a dorsal lithotomy position, and then either spinal or general anesthetic is administered. Following anesthesia, a urinary catheter is inserted to drain the bladder during the procedure and to assist in urethra location. To place the sling, a 3 to 4 cm vertical incision is made in the perineum just below the scrotum (see Figure 3). The bulbospongious urethra is then exposed (see Figure 4). The synthetic mesh is stretched to maximum tension over the urethra and secured to each descending pubic ramus with three titanium screws and polypropylene sutures (see Figure 5) (Carmel et al., 2010; Guimarães et al., 2008).

During implantation of the sling, a urethroscopy is performed to determine the ideal point to elevate the urethra. Urethroscopy after sling placement is also useful to rule out urethra perforation (Bauer et al., 2010). The sling reduces or eliminates urine leakage by compressing and elevating the urethra, “allowing better intra-abdominal pressure transmission” (Carmel et al., 2010, p. 1015). It can be difficult to standardize the degree of sling tension needed to restore continence. A balance between adequate bladder emptying and patient satisfaction is necessary.

**Transobturator Procedure**

The transobturator sling procedure is performed similarly to the bone-anchored sling with the following differences: sling placement, two additional smaller bilateral incisions, and anchoring (Cornel et al., 2010). de Leval and Waltregny (2008) explain how the transobturator sling is placed with the inside-out transobturator approach. Passers, a thin pair of stainless steel instruments with a vertical segment – the handle – and a perpendicular curved segment, are used to insert the precut polypropylene monofilament mesh. A stainless steel device with a blunt-ended semicircular gutter is used as a guide for the passer handle to slide into, and two small parallel and proximal wings hold onto the device. Not only does the guide help hold the passers during insertion of the sling, but it also prevents the passers from compressing the urethra.
Guided by the passers and guide, the mesh is placed on the urethral bulb, and the two lateral arms of the mesh are passed through the obturator foramina, rotated around the inferior pubic rami, pulled through the two smaller bilateral incisions, and tied to each other across the midline. The mesh is self-anchoring, and therefore, no screws are required (Bauer et al., 2009). It is secured onto the urethra bulb and perineal body with resorbable sutures (Rehder & Gozzi, 2007) (see Figure 6). As the mesh is pulled, the center of it moves the bulbar urethra upward. The sling is tensioned until the urethra is moved proximally 3 to 4 cm (Rapp, Reynolds, Lucioni, & Bales, 2007) (see Figure 7). The transobturator sling does not work by compression, but rather, supports and moves the urethra into the “normal” anatomic position, allowing the sphincter to restore bladder control (Bauer et al., 2009).

Comparison of the Bone-Anchored And Transobturator Approaches

Defined by the number of incontinence pads used per day, after the bone-anchored male sling procedure, approximately 40% of the patients were “completely dry,” 40% were “significantly improved,” and 20% were “surgical failures” (Moul, 2011). Continence rates of the bone-anchored male sling improved to 71% from 58% when they had a 24-hour pad weight of less than 423 gm (Kumar, Rosenberg Litt, Ballert, & Nitti, 2009). Success rates for patients with mild incontinence were 90%, moderate incontinence 76.6%, and severe incontinence 50% (Fassi-Fehri et al., 2007). Improvements in SUI were greater for bone-anchored sling if the patient used less than 5 pads per day, and did not have adjuvant radiotherapy or a previous surgery for urinary incontinence. Within this subgroup, 88% were cured, and 8% were improved (Guimarães et al., 2008).

Clinical results evaluating patients who had the AdVance transobturator male sling found that 63% were cured and 17% were improved, with an overall success rate of 80% (Cornu et al., 2009). Patients had a significant reduction in pad weight and pad use, as well as improved quality-of-life measures using the Patient Global Impression of Improvement Questionnaire 12 months following a transobturator sling placement (Cornu et al., 2009). Factors influencing success appeared to be experience, severity of baseline incontinence (patients with 6 pads per day or more demonstrated poor success), and co-morbidities, such as irradiation (de Leval & Waltregny, 2008). A later study by Leruth, Waltregny, and de Leval (2012) reported that 72% of 173 patients were moderately to completely satisfied with the procedure two years out, and that 49% were cured, 35% improved, and 16% not improved for an overall success rate of 84%. Obesity, a history of pelvic radiation, and bladder neck stenosis were the main cause of failure.

The inside-out transobturator male sling procedure is more commonly performed than the bone-anchored male sling. Surgeons at the authors’ facility prefer the transobturator male sling because 1) it is less invasive and quicker to insert because there are no bone anchors, and 2) it is noncompressive. The transobturator sling works by moving the urethra into its normal position, allowing the sphincter to control urine flow again. It only relieves SUI for men who have sphincter control. Since the bone-anchored sling works through compression, it is optimal for patients who do not have sphincter function. However, because the bone-anchored sling puts patients at risk for developing osteomyelitis, physicians at the authors’ facility, as well as in other facilities, prefer not to use this device.

Post-Operative Complications

As with any surgical procedure, there are potential complications. Acute urinary retention after catheter removal was found to be a complication for 21% of patients who received the Ad-
Vance transobturator male sling (Bauer et al., 2010). These patients were re-catheterized post-procedure, with all but one able to have the catheter removed between 2 days to 12 weeks without any further treatment (Bauer et al., 2010). Other rare complications following placement of the transobturator male sling included 1) urinary tract infection, 2) persistent perineal pain, 3) mild perineal pain, and 4) perineal hematoma (Bauer et al., 2010; de Leval & Waltregny, 2008). Erosion of the urethra occurred once in a patient who presented with symptoms of worsening incontinence and dysuria. When the sling was explanted, it was discovered that the erosion was caused from errors in surgical placement of the sling through the urethra (Bauer et al., 2009).

The most common complications following a bone-anchored sling procedure include transitory acute urinary retention at 10% to 12% and persistent perineal or scrotal pain at approximately 19% (Bauer et al., 2010). Seven percent of patients had temporary urinary retention requiring a Foley catheter that was removed after seven days (Carmel et al., 2010). This same study suggests 22% of the men had scrotal/perineal numbness or pain that resolved spontaneously after three months. Two percent of the patients had a mesh infection that occurred after one year and required removal of the device (Carmel et al., 2010). Anchor dislodgement and bone infection are uncommon complications (Moul, 2011). Even though the cause is not well understood, perineal pain has been reported by some men. It is hypothesized that it may be a result of either trauma to the superficial perineal nerves or compression of the neurovascular bundles (Carmel et al., 2010).

**Nursing Interventions**

Following prostate surgery, men present to the clinic for treatment options to treat their SUI. Nurses provide education and reinforce options available to patients. Nurses also play an important role in teaching patients post-operatively how to manage their care after a sling procedure. The surgery is usually done as an outpatient procedure. For this reason, a follow-up telephone call would be beneficial to monitor post-operative progress and reinforce education. Patients are often taught self-intermittent catheterization pre-operatively in the event they may have urinary retention. The nurse assists patients post-operatively by assessing for any complications. These can occur immediately following surgery and resolve quickly (Fassi-Fehri et al., 2007).

Complications associated with slings may include bleeding, urinary retention, infection, pain, screw dislodgement, and failures. The nurse should monitor for bleeding immediately post-operatively, and pressure should be applied to the bleeding site if indicated. Urinary output is closely monitored. After the patient urinates for the first time, a bladder scan is performed to check for urinary retention. If a patient is experiencing retention, he is encouraged to drink additional fluids to promote spontaneous urination. If a patient continues to have retention, the nurse reinforces self-intermittent catheterization or indwelling catheter care per physician orders (Gill et al., 2010). Either type of catheter can be used until retention resolves, which usually takes only a few days (Gill et al., 2010).

Patients are taught signs and symptoms of infection, which include dysuria, cloudy urine, and hematuria. Perineal pain has also been reported as a post-operative complication. Nursing interventions used to relieve perineal pain consist of administering pain medications, offering a hemorrhoid pillow, and application of ice. Nurses offer psychosocial support to patients who may experience surgical failure, sexual dysfunction, continued incontinence, or perineal pain (Maliski, Heilemann, & McCorkle, 2001).

**Post-Operative Instructions**

Post-operative instructions are reviewed and reinforced by the nurse with patients before they leave the hospital. Restrictions include no lifting 10 pounds or more for 6 weeks, no submerging in water for 3 to 4 weeks, no sexual activity for 4 to 6 weeks, and limited bending over and squatting. Patients are encouraged to drink plenty of fluids, walk frequently, shower 3 days following the procedure, and eat a regular diet. They should call their health care provider if they are unable to urinate or have difficulty with the self-catheterization procedure (Mayo Clinic, 2011).

**Summary**

The option of using male slings as a treatment for SUI is relatively recent; therefore, it is premature to know if men prefer the sling over other treatment choices. When patients were assessed for preferences between a male sling and an AUS, 92% of the men chose a male sling even though they were informed that the efficacy of the male sling is almost equal or slightly lower than the AUS. Even when they were told that the procedure may be less effective, 25% of the men chose to have a male sling instead of an AUS (Kumar et al., 2009).

Male slings are an alternative to an AUS for patients with mild to moderate incontinence, uncontrolled stricture disease, and men who cannot manage a mechanical device. AUS continues to be the gold standard treatment for SUI that has not responded to less invasive treatments. AUS still has the best suc-
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