

Managing SUI - Moving Towards A Holistic Approach.

I don't have any solution, but I certainly admire the problem - Ashleigh Brilliant

Urinary incontinence (UI) and overactive bladder (OAB) are the most common types of lower urinary tract dysfunction, occurring in about one-third of adult women. It is sad but true that even in this millennium we are still completely at sea when the patient asks us "doctor do you know why I have stress urinary incontinence; can you cure me of it"? Sure, we have many theories, some plausible and others bordering on the absurd. Moreover we have treatments and surgeries based on these theories which actually amount to all women being treated the same way with minor differences depending on which surgery is chosen. This makes it imperative for gynecologists to realize that this complex problem needs to be studied in much greater depth and detail.

Evaluation

Urinary symptoms and signs in these conditions are nonspecific and often overlapping. The patient with stress incontinence characteristically has no urgency or frequency, manages to reach the toilet in time after she gets the urge to void, and seldom has to get up at night to pass urine. Her main complaint is the leakage of urine on physical exertion. Contrary to this, a patient who has urge incontinence typically has urgency, frequency, has to get up to pass urine often at night and may not be able to reach the toilet in time to pass urine after an urge to void. There could however be a patient with a mixed picture of incontinence.

Testing for evaluation of the lower urinary tract

With time the tests for evaluating the lower urinary tract have become more sophisticated and specific. However, there still is no single test which can serve as a gold standard for the definitive diagnosis of stress incontinence. Since the etiology and clinical presentation is varied different approaches have to be adapted to arrive at a final diagnosis.

Several studies have shown that there could be a discrepancy between the history and urodynamic diagnosis in a significant number of patients. Many studies show only 50% to 70% specificity and sensitivity'. There is no doubt that urodynamic

testing has an important role to play in the evaluations and management of these patients.

Drug therapy for stress incontinence

Most attempts at the pharmacologic treatment of stress incontinence have aimed to increase the alpha-adrenergic input to the urethra. As with other studies of pharmacologic therapy, results tend to be better in nonrandomized studies than in controlled trials.

Phenylpropanolamine is no longer marketed in the USA because of severe side effects including cardiac events. Prospective randomized controlled trials validating the apparent success rates of several small, uncontrolled series for norephedrine and imipramine are not available. Anecdotal clinical experience suggests that the success rate is significantly lower than reported'.

Given that estrogen may enhance the sensitivity of alpha-adrenergic receptors in the bladder neck and urethra, several investigators have examined the clinical utility of combined estrogen and alpha-adrenergic therapy for the treatment of stress incontinence. Most studies of combination therapy show an improvement in symptoms; however, objective findings such as increases in urethral pressure are less consistent",

New serotonin and norepinephrine reuptake inhibitors show promise. A large, randomized, placebo-controlled trial assessed the impact of duloxetine on stress incontinence in women. Five hundred fifty-three women between the ages of 18 and 65 years were randomly assigned to placebo or to three different doses of duloxetine. After 12 weeks, the median number of incontinent episodes decreased in all groups, with the greatest reduction in women taking the highest dose viz., 80 mg per day. A substantial improvement rate noted in women taking placebo mimics that reported in other randomized trials of drug therapy. While this is in part due to the placebo factor itself, it also demonstrates the therapeutic effect of keeping a voiding diary, in itself an intervention as well as an outcome measures.

Behavioural interventions for SUI

Behavioral interventions either target the bladder (bladder training and behavioral modification) and/or the bladder outlet (pelvic floor muscle rehabilitation, electrical stimulation).

Behavioral treatments have several advantages that make them attractive interventions. In addition to their safety, they are usually without side effects (except for electrical stimulation and vaginal weights) and most patients report that they are comfortable.

One of the disadvantages of behavioral treatments is their reliance on the active participation of an involved and motivated patient who can learn and acquire new skills. One of the greatest challenges lies in how to motivate patients to be actively involved and to sustain their efforts long enough to experience noticeable changes in bladder control. Another limitation is that cure rates in controlled trials are usually in the 25% to 35% range. Thus, there is a need to enhance the effectiveness of these conservative therapies.

Surgery for SUI

*Even a clock that does not work is right twice a day.
- Polish Proverb.*

Long-term data suggest that Burch colposuspension and sling procedures, using autologous or synthetic materials, produce similar objective cure rates ranging from 50% to 80%. These results are, however, supported by only a few randomized trials but a large number of case series. Anterior colporrhaphy, Kelly's stitch, needle urethropexy, and paravaginal defect repair have lower cure rates for SUI.

For slings, due to the presence of an increasing number of new (and unproven) materials, further study is needed to determine whether the choice of material influences the outcome. In the American Urological Association review by Leach et al, the level of evidence for articles on sling procedures was B (intermediate) or C (low) by AHCPR guidelines^v.

The TVT holds out promise for the future but it certainly cannot be regarded as the panacea for SUI that it is sometimes made out to be. It had a rapid

uptake after introduction but this can be attributed to the ease of the procedure. However, it is not a procedure without complications.

In a multicenter study, intra-operative bladder perforation was recognized in 9% of procedures, but no long-term sequelae resulted. Short-term voiding disorders occurred in 4.3% of women, and retention requiring transection of the tape in 1% to 2.8%. Mesh erosion into the vagina or urinary tract, pelvic hematoma, and bowel perforation can occur, but are very rare".

The only randomized trial comparing the results of TVT versus Burch colposuspension showed similar objective and subjective cure rates from both procedures. In this study, where TVT and colposuspension were employed as a primary procedure, complete continence was reported in 38% after TVT and 40% after Burch. Stress continence was reported in 66% and 68%, respectively. The success rates seem to be low in this study probably due to the strict criteria used to denote cure. Be as it may, it again highlights the several deficiencies in the current surgeries for SUI⁹.

Current literature suggests that laparoscopic Burch has lower cure rates but more studies with higher power are needed":

Long-term complications after Burch colposuspension, pubovaginal slings, and TVT are mostly related to voiding dysfunction and urgency. The TVT procedure seems to result in more rapid return to voiding although, as with other slings, a small number of cases still result in retention requiring sling transection.

Bulking agents provide a relatively noninvasive method of treatment for SUI. Short term data suggest a cure rate of 48%, and an overall cure and improvement rate of 76%. Longer-term results suggest a continued decline in success rate necessitating repeat injections. It is not known whether non-absorbable bulking agents last longer; in the short term, there is no difference in results".

The treatment of symptomatic SUI with Stage III or IV pelvic organ prolapse generally follows the route of the prolapse repair procedure; a Burch colposuspension is

done if the prolapse repair is abdominal, and a pubovaginal or midurethral sling is done if the prolapse repair is transvaginal. Treatment of potential SUI in women with severe prolapse remains controversial and recommendations are based only on few studies^v".

In the current state of affairs there is not much to choose between a Burch colposuspension, sling procedures or the TVT. Although the classic methods like Kelly's stitch have lower success rates they cannot be dismissed off hand. When the other methods are not available they can still be used particularly in low tech settings. In a country like ours they are still not irrelevant.

Tissue engineering

Recently tissue engineering techniques have been applied to the treatment of SUI. Several tissue types have been investigated including myoblasts, fibroblasts, neuronal stem cells, and adipose-derived stem cells¹³. Transurethral ultrasound-guided injection of cultured autologous myoblasts and fibroblasts into the external urethral sphincters has been described in pigs, rats, and even humans".

Injected muscle cells were able to functionally incorporate into the external urethral sphincter. If these data are confirmed, it will mark a significant advancement in the use of bulking agents in the treatment of intrinsic sphincter deficiency in that the injected agent not only mechanically "bulks up" the sphincter but actually improves its muscular function. This technique offers the promise of improved sphincter function as well as treatment durability.

References

1. Colli E, Artibani W, Goka J et al. Are urodynamic tests useful tools for the initial conservative management of non-neurogenic urinary incontinence? A review of the literature. *Eur Urol* 2003;43:63-9.
2. Ek A, Andersson KE, Gullberg B et al. The effects of long-term treatment with norephedrine on stress incontinence and urethral closure pressure profile. *Scand J Urol Nephrol* 1978;12:105-10.
3. Ahlstrom K, Sandahl B, Sjoberg B et al. Effect of combined treatment with phenylpropanolamine and estriol, compared with estriol treatment alone, in postmenopausal women with stress urinary incontinence. *Gynecol Obstet Invest* 1990;30:37-43.
4. Beisland HO, Fossberg E, Moer A et al. Urethral sphincteric insufficiency in postmenopausal females: treatment with phenylpropanolamine and estriol separately and in combination. A urodynamic and clinical evaluation. *Urol Int* 1984;39:211-6.
5. Norton PA, Zinner NR, Talcin I et al. Duloxetine versus placebo in the treatment of stress urinary incontinence. *Am J Obstet Gynecol* 2002;187:40-8.
6. Clinical Practice Guideline. Urinary Incontinence in Adults: Acute and Chronic Management. U.S. Department of Health and Human Services. Public Health Service. Agency for Health Care Policy and Research. 1996; Rockville, Maryland. *AHCPR Publication NO. 96-0682*.
7. Leach GE, Dmochowski RR, Appell RA et al. Female Stress Urinary Incontinence Clinical Guidelines Panel summary report on surgical management of female stress urinary incontinence. [The American Urological Association]. *J Urol*. 1997;158:875-80.
8. Tamussino KF, Hanzal E, Kolle D et al. Tension-free vaginal tape operation: results of the Austrian registry. *Obstet Gynecol* 2001;98:732-6.
9. Ward K, Hilton P. Prospective multicentre randomized trial of tension-free vaginal tape and colposuspension as primary treatment for stress incontinence. *BMJ* 2002;325:1-7.
10. Moehrer B, Carey M, Wilson D. Laparoscopic colposuspension: a systematic review. *Br J Obstet Gynaecol* 2003;110:230-5.
11. Dmochowski RR, Appell RA. Injectable agents in the treatment of stress urinary incontinence in women: where are we now? *Urology* 2000;56(Suppl 6A):32--40.
12. Black NA, Downs SH. The effectiveness of surgery for stress incontinence in women: a systematic review. *Br J Urol* 1996;78:497-510.
13. Yoo JJ, Snyder E, Atala A. Engineering of innervated sphincteric muscle using neuronal stem cells (Abstract #1055). *J Urol*. 2003;169:272.
14. Lee JY, Cannon TW, Pruchnic R et al. The effects of periurethral muscle-derived stem cell injection on leak point pressure in a rat model of stress urinary incontinence. *Int Urogynecol J Pelvic Floor Dysfunct* 2003;14:31-7.