Management of Stress Urinary Incontinence

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Introduction:
Stress urinary incontinence (SUI) is defined as the involuntary loss of urine during effort or exertion or during sneezing or coughing.1 It has been estimated that 10 to 20% of adult women are affected by SUI. It severely affects every facet of the patients’ life – work, home, social, physical, sexual, psychological and medical.

Aetiology:
In females SUI is most often caused by pelvic floor muscle laxity as a result of repeated childbirths. As a result of the laxity there is loss of anatomical support to the bladder neck and the proximal urethra. During increase in intra-abdominal pressure the weakened anatomical support allows the bladder neck and proximal urethra to rotate down and posteriorly. The resulting shearing force opens up the urethra and thus incontinence occurs.2, 3 A less common cause of SUI is intrinsic sphincter deficiency (ISD) in which the urethral sphincter is intrinsically weak, regardless of its anatomical position. It is characterised by an open bladder neck and proximal urethra even at rest, with minimal or no urethral descent during stress. ISD can result from previous surgery that damage urethral sphincter, neurological insult, radiation damage and ageing.

Assessment
Evaluation of patients with SUI should consist of structured micturition history, physical examination, micturition diary, pad test, urinalysis and culture, renal function test and urodynamic study.

History is important in assessing the characteristics and severity of SUI as well as its impact on quality of life. It is also important in identifying risk factors or underlying causes for the incontinence.

Physical examination should focus on detecting anatomical and neurological abnormalities that contribute to the SUI. A vaginal examination should be performed to assess the tone of the pelvic floor muscles and also to check for pelvic organs prolapse. With the bladder comfortably full the patient is asked to cough or strain in an attempt to reproduce the stress urinary incontinence.

Micturition diary is useful in providing information on patient’s drinking and voiding patterns. The patient is asked to record the timing and amount of fluid intake, urine voided, any leakage of urine and the activities associated with leakage of urine.

Pad test provides a semi-objective measurement of urine loss over a given period of time. Various pad tests have been described but the International Continence Society recommends using the one-hour pad test during which a series of standard activities is carried out and the weight gain of the pad is then measured. Weight gain of less than 1 g is within experimental error and the patient should be regarded as essentially dry. The pad test also provides an objective assessment of improvement after treatment for SUI.

Urodynamic study is an useful tool to determine the exact aetiology of the patient’s incontinence and to evaluate the detrusor function and determine the likelihood of voiding dysfunction after treatment of SUI. If facility is available, synchronous measurement and display of urodynamic parameters with radiographic visualisation of the lower urinary tract (video-urodynamics) would be even more ideal as it allows us to determine the degree of pelvic floor prolapse. Patients with wide open bladder neck and proximal urethra even at rest are indicative of ISD.

Conservative Treatment:
Conservative measures like proper fluid management and timed voiding are simple and effective ways for patients to regain their bladder control. Patients are asked to avoid excessive fluid intake and also caffeine. Life style adaptations such as weight loss, smoking cessation, avoidance of straining and constipation are also advocated.

Drug treatments using alpha-adrenoceptor agonists have been tried in the past to augment the urethral sphincter function. However most the currently available alpha agonists are non-selective and their systemic side effects have limited their use in treating SUI.4 Duloxetine, a selective serotonin and norepinephrine reuptake inhibitor is currently being researched as a treatment for SUI. Preliminary studies showed that it produces significant improvement in symptoms compared with placebo.5 However it is still under clinical trial and is not available in the market yet.

Pelvic floor exercise (PFE) is often advocated for patients with mild symptoms or before their consideration for surgery.6 It entails the voluntary contraction of the pelvic floor muscles. It is difficult for the patient to identify and isolate the pelvic floor muscles properly. Therefore a dedicated continence nurse is necessary to instruct the
patient to contract the correct group of muscles. The patient is then asked to do it on a daily basis and regular assessments by the continence nurse is necessary to provide reinforcement and also to assess the progress. It has been shown that PFE used in conjunction with biofeedback improves the outcome of treatment. One method of biofeedback is the weighted vaginal cones, which are inserted into the vagina and held in place by voluntary contraction of the pelvic floor muscles. Or we can use the sophisticated perineometers with vaginal pressure balloons.

Apart from the active pelvic floor exercise mentioned above, the pelvic floor muscles can be rehabilitated passively by either electrical stimulation or magnetic stimulation. The advantage of these modalities of treatment is that they are not dependent on patient’s effort and no supervision is required. However there is considerable disagreement in the literature on the efficacy of this passive pelvic floor exercise. Some studies have shown that they are no better than other forms of conservative treatment.

Operative Treatment:
The goals of surgical treatment for SUI are to prevent abnormal descent of the urethra that occurs during increases in abdominal pressure and to provide a backboard against which the bladder neck and proximal urethra can be compressed during increase in abdominal pressure. Treatment falls into the following 4 major categories:

1. Transvaginal needle suspension
2. Colposuspension
3. Sling procedure
4. Injectables

Transvaginal needle suspension procedure was once very popular in the 80’s and early 90’s. It involves the suspension of the paraurethral tissue to the rectus sheath using non-absorbable sutures. However the sutures will soon cut through the paraurethral tissue and thus the long term result is very poor. The success rate drops from 90% in the early post-operative period to only 50-60% at 5 years after the operation. Thus the procedure only has a limited role in the treatment of SUI nowadays.

Burch colposuspension has been considered the gold standard for treatment of SUI due to pelvic floor laxity for almost 40 years. First described in 1961, it involves the lateral fixation of the urethro vaginal tissue to the Cooper’s ligament. It produces long term durable results. Studies have shown that the success rate is more than 80% even after 10 years.

In the era of minimal invasive surgery, laparoscopic colposuspension was once an enthusiasm for urologists. The blood loss was less and the hospital stay was shorter. However the results was not able to mimic the open procedure. The study by McDougall showed that the success rate after 36 months was only 30%, so this procedure has fallen out of favour nowadays.

Over the past decade, urethral slings have become the treatment of choice for females with SUI. In 1978 McGuire reported the use of free rectus slings positioned under the bladder neck and sutured to the abdominal fascia with permanent suture. The strip is placed under minimal tension and anchored to the underside of the urethra to prevent displacement. Other materials have been used including autologous fascia lata and cadaveric fascia. This procedure produces good long term success rate of 80-90%. In the past few years, the use of suburethral tape has gained wide popularity. It involves the placement of a tension free synthetic tape to the mid-urethra. It is first introduced by Ulmsten in 1996 and various modifications including the SPARC procedure and the IVS have been described. It is a minimal invasive procedure with short learning curve. It could be done under local anaesthesia and the patient can be discharged on the same day. The success rate is more than 80% up to 5 years but we have yet to see the long-term outcome. Possible complications include prolonged retention, de novo detrusor instability and erosion.

Periurethral injection of bulking agents is another option for increasing the outlet resistance especially in patients with ISD. It involves the deposition of bulking agent within the submucosa of the proximal urethra and bladder neck. Various materials have been described including collagen, Teflon, silicone microimplants (Macroplastique), hylauronic acid and dextranomer microspheres (Deflux) and autologous fat. Although minimally invasive, this procedure carries a success rate of only 25-50% only and is not durable. Repeated injections are often required. Thus it is only reserved for patients who are poor surgical candidates.

Conclusions:
Women in Hong Kong are becoming more aware of the condition of SUI and are more willing to seek medical advice for this condition as SUI significantly affects the quality of life. The treatment depends upon the nature and severity of the condition. Conservative and non-invasive measures should be advocated to patients with mild symptoms and prior to considering surgery. The pubovaginal sling procedure and the Burch colposuspension both provide good and durable results but they involve prolonged post-operative recovery as a result of the large abdominal incision. The use of synthetic suburethral tape is very appealing because of the minimal access, short hospital stay and rapid recovery time. However we still need long term follow up to assess its durability and late complications.

References: