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Recent advances in the management of urinary incontinence in the female

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Abstract

Urinary incontinence is a distressing problem that has a significant impact on quality of life. Physiotherapy should be tried prior to considering surgical treatment for this condition. Mid-urethral sling procedures are recommended when conservative treatment fails in women with stress urinary incontinence. Primary surgical procedures offer the best success rates, and therefore, proper selection of the patient, along with appropriate counselling regarding success rates and the risks attending the procedure, should help to meet the patient's goals and expectations following surgery. Overactive bladder symptoms are treated conservatively with lifestyle modifications, bladder training and anticholinergic agents. When there is no improvement after anticholinergic treatment, botulinum toxin A (Botox) can be considered, but this has not been licensed for this indication. Sacral or ankle nerve stimulation can be an effective alternative when medical treatment fails.

Keywords: overactive bladder, management, tension-free vaginal tape, transobturator tape, urinary incontinence.

Introduction

Urinary incontinence (UI) is defined as any involuntary loss of urine and this condition commonly affects women of all ages. It can seriously affect physical, psychological and social well-being. An estimated 4 million women over 40 years of age are regularly incontinent in UK, and the projected current cost to the National Health Service is £233 million annually.

Stress urinary incontinence (SUI) is essentially caused by pelvic floor muscle (PFM) weakness. It is characterized by the loss of small amounts of urine accompanying coughing, laughing, sneezing, exercising or other movements that increase intra-abdominal pressure, and thus, increase pressure on the bladder. Physical changes resulting from pregnancy, childbirth and the menopause often cause SUI.

At the initial clinical assessment, a woman's UI should be categorized as SUI, mixed UI (MUI), or urge UI (UUI)/overactive bladder (OAB) syndrome. Preliminary treatment should

be started on this basis. In cases of MUI, treatment should be directed towards the predominant symptom (NICE 2006).

The use of multi-channel cystometry is not recommended before starting conservative treatment. For the small group of women with a clearly defined clinical diagnosis of pure SUI, the use of multi-channel cystometry is not routinely recommended (NICE 2006).

Urinary incontinence

Conservative treatment

Lifestyle intervention and treatment of medical co-morbidities can be helpful in order to reduce urinary symptoms.

A trial of supervised PFM training of at least 3 months in duration should be offered as a first-line treatment to women with SUI or MUI (Hay-Smith *et al.* 2006). Pelvic floor muscle training should be offered to women during their first pregnancy as a preventive strategy for UI because this reduces the likelihood of postnatal UI (NICE 2006). The role of conservative therapy following previous continence surgery has not been established.

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Duloxetine is not recommended as a first-line treatment for women with predominant SUI. It may be offered as second-line therapy if women prefer pharmacological to surgical treatment or are not suitable for surgical treatment, but they should be counselled about its adverse effects (Cardozo *et al.* 2004).

Surgery for incontinence

Hundreds of procedures for the treatment of female incontinence have been devised. The risks and benefits of surgical and non-surgical options should be discussed. The woman's child-bearing wishes should be considered during the dialogue. The long-term efficacy of most incontinence operations is unknown.

Primary surgery should only be considered after a period of conservative treatment from a specialist therapist has been offered and rejected, or has failed. Primary surgical procedures offer the best success rates. Any prognosis regarding the success of a surgical procedure following a previous failed surgery should be guarded (Lee *et al.* 2007). Burch colposuspension is an effective surgical procedure for SUI (Kjølhede 2005), with a continence rate of 85–90% at one year. Although the continence rate falls to 70% 5 years after surgery, this procedure still shows more longevity than other methods of treatment (RCOG 2003).

Anterior repair is less successful as an operation for continence than retropubic procedures and has been superseded by sling procedures. The role of other suprapubic operations, such as the Marshall–Marchetti–Krantz procedure, paravaginal repair and laparoscopic colposuspension, is unclear (RCOG 2003).

Retropubic mid-urethral tape procedures using a 'bottom-up' approach with macroporous (type 1) polypropylene meshes are recommended as treatment options for SUI when conservative management has failed. Open colposuspension and autologous rectus fascial sling are the recommended alternatives when these are clinically appropriate (NICE 2006).

Tension-free transvaginal tape (TVT) was introduced in Sweden in the 1990s by Ulf Ulmsten and Papa Petros. Over one million procedures have been carried out world-wide to date. This is a minimally invasive surgical procedure that utilizes the unique monofilament Prolene mesh. This procedure can be performed under local, general or spinal anaesthetic. Side effects of the procedure can include bladder perforation, postoperative voiding problems,

urgency, erosion and infection of the mesh (Novara *et al.* 2008).

The following points should be noted:

- Tension-free TVT has been shown to produce similar objective and subjective continence rates to colposuspension, but involves a shorter hospital stay (Latthe *et al.* 2007).
- A 7-year follow-up of the tension-free TVT procedure revealed an 81% cure rate and a 98% improvement rate (Nilsson *et al.* 2004).
- Cure rates obtained with the TVT obturator (TVT-O) system compared favourably with those reported for the retropubic and outside-in transobturator tape (TOT) approaches, but longer-term data are not available (Latthe *et al.* 2007).
- Five randomized controlled trials (RCTs) have compared TVT-O with TVT and six RCTs have compared TOT with TVT, leading to the conclusion that bladder injuries and voiding difficulties are reduced, but that the risk of vaginal erosions and groin pain is increased with TVT-O/TOT (Latthe 2008).
- Updated longitudinal data on the TVT Secur system revealed a declining continence rate over time following the procedure. This method was associated with a higher failure rate, which was 27% at 6 months following the procedure (Debodinance *et al.* 2007).

Injectable agents

Injectable agents have a role after other procedures have failed; for example, when a diagnosis of intrinsic sphincter deficiency is made. The short-term continence rate is 48%, with an improvement rate of 76%. The effect decreases over time and repeat injections may be needed (Martins *et al.* 2007).

Silicone treatments using Macroplastique[®] (Uroplasty Ltd, Manchester, UK) had cured or brought about improvements in 60% of a prospective cohort of women with recurrent stress incontinence at a 19-month follow-up (Radley *et al.* 2001).

Artificial sphincters

In 1972, the artificial urethral sphincter (AUS) was introduced for the treatment of severe intrinsic sphincter deficiency. These devices can be successfully used after a previous failed continence surgery, but AUSs have a high morbidity rate and can result in a need for further surgery (17%). As a primary procedure for SUI, the AUS has a cure rate of 80% and an improvement rate of 90%. The risks associated with this device

are malfunction of the AUS or cuff erosion (Richard *et al.* 1996).

Non-surgical options for stress urinary incontinence

The non-surgical options for SUI are as follows:

- Absorbent pads, diapers and Kegel exercises can be employed.
- Incontinence-modified pessaries can provide support beneath the urethra, compensating for the laxity of urethral support found in most SUI situations.
- Special devices such as urethral plugs, urethral implants, and intravaginal and intra-urethral devices are not recommended for the routine management of UI in women. Patients should not be advised not to consider such devices other than for occasional use when necessary to prevent leakage; for example, during physical exercise (NICE 2006).

Overactive bladder syndrome

Overactive bladder syndrome is defined as urgency that occurs with or without UUI, and usually with frequency and nocturia. These combinations of symptoms are suggestive of the urodynamic finding of detrusor overactivity, but can be the result of other forms of urethrovesical dysfunction.

Conservative treatment

A trial of supervised PFM training for 3 months should be initiated. Bladder training should be tried for a minimum of 6 weeks (NICE 2006).

The first-line drug treatment if bladder training is ineffective is immediate-release non-proprietary oxybutynin (OAB/MUI). Other medications that can be tried for management of OAB symptoms include darifenacin, solifenacin, tolterodine, trospium, or an extended release or transdermal formulation of oxybutynin (Hay-Smith *et al.* 2005). Intravaginal oestrogen can be helpful in postmenopausal women with vaginal atrophy (Long *et al.* 2006).

Sacral nerve stimulation

Sacral nerve stimulation is recommended for the treatment of UI caused by detrusor overactivity in women who have not responded to conservative treatments. This should be offered on the basis of their response to preliminary percutaneous nerve evaluation, and life-long follow-up is recommended. There is a stronger body of evidence for the effectiveness of sacral

nerve stimulation than for other procedures. Up to two-thirds of patients achieve continence or a substantial improvement in their symptoms after this treatment (Groenendijk *et al.* 2008).

Percutaneous ankle nerve stimulator

The percutaneous ankle nerve stimulator works by peripheral nerve stimulation, with the needle being placed near the ankle about three finger-breadths above the inside of the anklebone. Low-frequency electrical stimulation is applied for 30 min once a week for approximately 12 weeks. The success rate is 80%, with at least a 25% reduction from baseline in daytime or night-time frequency (Amarenco *et al.* 2003).

Botulinum toxin A

Botulinum toxin A (Botox) is only used for the treatment of idiopathic detrusor overactivity in women who have not responded to conservative treatments. This is a purified neurotoxin complex that blocks the release of acetylcholine and other transmitters from presynaptic endings, decreases muscle contractility and causes muscle atrophy at the injection site. The treatment is carried out by cystoscopy, and the injections are given directly into the inside of the bladder under local or general anaesthesia. It can cause urinary retention, and hence, women should be willing and able to self-catheterize. Studies have shown success rates of between 26% and 80%; however, there is a lack of long-term data, and the treatment may need to be repeated (Ehren *et al.* 2007).

Augmentation cystoplasty

Augmentation cystoplasty is an option for intractable detrusor instability when all other modalities of treatment have failed (Kim *et al.* 2008).

Conclusion

Surgical management has revolutionized the treatment of patients with genuine SUI in cases for whom physiotherapy has not helped to alleviate symptoms. Anticholinergic agents are the mainstay treatment for OAB symptoms, with dryness of mouth being the main side effect that limits treatment.

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