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Diagnosis and treatment of pelvic organ prolapse complicated with stress urinary incontinence: A Chinese expert consensus

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Pelvic organ prolapse (POP) and stress urinary incontinence (SUI) share common pathological mechanisms,[1] and are both manifestations of pelvic floor dysfunction, often co-occurring and developing concomitantly. Although POP develops concomitantly with evident SUI in some cases, there have been instances wherein POP occurs without prior urine leakage before repositioning the prolapsed organs, but urinary incontinence develops after the prolapsed organs are repositioned. The condition in such cases is termed as occult SUI (OSUI), with an incidence of approximately 23.5% among patients with POP.[2]

1. Epidemiology and pathological mechanisms

Despite sharing several epidemiological risk factors such as pregnancy, increased gravidity and parity, obesity, advanced age, persistently elevated intra-abdominal pressures (IAP) (eg, persistent cough or constipation), menopause, and family history, POP and SUI have complex and multifactorial etiologies. Furthermore, advanced age and Green type III cystocele (bladder prolapses to the level of the urinary meatus, the posterior urethrovesical angle <140°, urethral rotation angle ≥45°) are risk factors for concomitant OSUI in patients with POP.[3]

Although POP and SUI represent distinct clinical manifestations with a shared cause, which is currently believed to be a class of disorders linked to an imbalance of pelvic floor dynamics, the majority of POP cases involve the anterior vaginal wall or the bladder. This type of prolapse is highly likely to result in laxity and protrusion of the bladder's neck and posterior wall, causing impaired support from the middle posterior urethra. This, in turn, leads to a reduced functional length of the urethra and the development of SUI symptoms.[4] Although current surgical procedures for POP repositioning can correct the anatomical positions of the involved organs, they cannot address problems involving the mechanisms of urinary control, such as sphincter dysfunction, thinning of the urethral mucosa, and autonomic dysfunction of the involved organs. Consequently, SUI becomes particularly prominent in the postoperative period.[5,6]

Biomechanical finite element analyses of the pathological mechanisms of pelvic floor stress dysfunction reveal that SUI and POP are disorders of mechanical imbalance inexorably linked to each other. Moreover, they serve as pelvic manifestations of the overall systemic deterioration of the body's mechanical properties. Achieving optimal therapeutic efficacy requires more than just correcting SUI or POP in isolation. It necessitates restoring the overall health of the body and its mechanics through a comprehensive understanding of the body's overall condition and mechanical imbalance post–pelvic floor stress dysfunction.[7,8]

2. Diagnosis and evaluation

The diagnosis of POP accompanied by SUI primarily relies on a thorough medical history and specialized examination. Questionnaires and laboratory examinations are not suitable for clear differential diagnosis from POP or SUI alone.

2.1. Medical history

The typical symptom of POP accompanied by SUI involves protrusion of a mass from the vagina that can be seen, palpated, or otherwise sensed, which may also be accompanied by urine leakage during activities that increase IAP, such as exercise, laughing, coughing, or sneezing. Some patients may also present with frequent urination, urinary urgency, urge incontinence, or difficult urination.

2.2. Specialist examination

Patients should be positioned in lithotomy or, if necessary, a standing position for examination. Observation includes checking for urinary leakage from the external urethral meatus, prolapse of pelvic organs, and maximum extent of organ prolapse at rest, during coughing or breath holding. Results should be recorded using the POP-Q system.

Vaginal repositioning testing should be performed to avoid missing a diagnosis of OSUI. Specifically, stress induction testing should be performed after repositioning of the prolapsed organs, preferably in the standing position if possible. In addition, pad weight testing should be performed as a preliminary evaluation of urine leakage. Many methods of repositioning are available, with reliable results achieved by restoring the normal position of the vagina using an appropriately sized pessary or sterile cotton gauze.[9,10]

2.3. Urodynamic testing

The 2019 National Institute for Health and Care Excellence guidelines serve as the international consensus to determine whether

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urodynamic testing is required in cases of POP accompanied by SUI. Urodynamic testing is currently recommended in the following situations: (1) mixed urinary incontinence or urinary incontinence of unknown cause; (2) voiding dysfunction as the primary symptom; (3) SUI with concomitant anterior or apical prolapse; (4) previous history of surgical treatment for urinary incontinence. Notably, this testing should be conducted only after repositioning of the prolapsed pelvic organs, distinguishing it from other urodynamic testing methods.

2.4. Differential diagnosis

It is necessary to differentiate among the types of urinary incontinence associated with POP, primarily including the following:

1. Urge incontinence: Involuntary urine leakage associated with a strong and sudden need to urinate, rather than leakage triggered by activities such as coughing or sneezing that elevate IAP.
2. Overflow incontinence: Involuntary leakage of urine due to an overdistended bladder. This is commonly encountered in cases of chronic urinary retention caused by various factors, resulting in continuous or intermittent urine leakage when bladder pressure exceeds urethral resistance.
3. Genuine stress incontinence: A loss of urine due to a rise IAP, even when the bladder is not full. Common causes include urethral sphincter damage and congenital or acquired neurogenic diseases.

3. Conservative treatment

Conservative treatment is recommended for patients with POP of grade ≤2, as assessed by the POP-Q, accompanied by mild or moderate SUI. The selection of treatment depends on the patient's preferences, disease severity, the benefits and risks of the chosen treatment, and other relevant factors. Various treatment methods are available, including follow-up observation, lifestyle interventions, pelvic floor muscle training (PFMT), pelvic floor physical therapy, pessaries, medication, and traditional Chinese medicine and acupuncture.

3.1. Follow-up observation

Follow-up observation is a suitable option for asymptomatic patients, but it should be accompanied by lifestyle intervention guidance and health education.

3.2. Lifestyle interventions

All patients diagnosed with POP accompanied by SUI should actively receive behavioral guidance to mitigate factors that exacerbate pelvic floor injury. This may involve weight loss, smoking cessation, avoidance of activities that increase pelvic floor stress, and the treatment of constipation and cough.

3.3. Pelvic floor muscle training

Numerous PFMT methods are available, with Kegel exercises being simple yet effective in increasing the strength and coordination of weak pelvic floor muscles. Currently, a recommended duration of 3 continuous months of muscle training is advised for improving pelvic floor dysfunction, especially in cases of mild or moderate SUI.[11,12]

3.4. Physical therapy

Biofeedback, adjuvant electrical stimulation, and electromagnetic therapy can enhance the effectiveness of PFMT and shorten the duration of therapy.

3.5. Pessaries

Pessaries are devices inserted into the vagina to enhance pelvic floor function by restoring the normal anatomical positions of the uterus, vaginal wall, urethra, and bladder. They represent a first-line conservative treatment option for POP. Specifically, pessaries designed to address urinary incontinence can alleviate the majority of symptoms in patients with mild to moderate POP accompanied by SUI[13] and are particularly suitable for patients with fertility requirements or those for whom surgery is contraindicated. However, proper guidance on usage and regular follow-up visits are essential.

3.6. Medication

Generally, medication is not considered a first-line treatment for POP accompanied by SUI. However, local estrogen treatment may be considered if the patient presents with genitourinary syndrome of menopause, which can help alleviate vaginal dryness, reduce urinary tract symptoms, and increase the thickness of the urethral mucosa, indirectly improving symptoms of urinary incontinence.[14]

3.7. Traditional Chinese medicine

Electroacupuncture, traditional Chinese medicine, and other procedures can improve pelvic floor support and alleviate symptoms of prolapse and urinary incontinence to some extent, serving as adjuvant treatments.

4. Surgical treatment of POP with SUI

Nearly 70% of patients with severe POP exhibit symptoms of SUI.[15] For POP patients with evident SUI, surgical treatments solely addressing POP have limited efficacy for SUI. Hence, we recommend simultaneous surgical treatment of SUI (evidence grade C). Surgical interventions for SUI encompass midurethral slings (MUS) and Burch colposuspension (Burch procedure).

4.1. Midurethral sling

Midurethral sling corrects urinary incontinence by strengthening the overactive middle segment of the urethra. With a subjective cure rate of 75%–94% and an objective cure rate of 57%–92% for SUI, MUS stands as a superior treatment for urinary incontinence compared with the Burch procedure, establishing itself as the criterion standard for surgical treatment of female SUI. Medical evidence indicates that, in POP patients with evident SUI preoperatively, simultaneous MUS during pelvic floor reconstruction can reduce the subjective incidence of postoperative SUI and further decrease the need for surgical management of SUI.[16] For SUI patients with characteristics such as small bladder volume, urinary retention, or detrusor muscle dysfunction, preoperative urodynamic testing should be conducted to assess bladder function, and the option of surgical SUI management should be carefully considered. In cases where MUS is performed simultaneously with surgical POP management, it is recommended to tighten the sling and adjust tension after completing pelvic floor reconstruction. Complications of MUS may include bladder and urethral injury, difficult urination, pain in the medial thigh and pelvic cavity, and mesh exposure or erosion.

4.2. Burch procedure

The Burch procedure addresses urinary incontinence by elevating the neck of the bladder and restoring the posterior urethrovesical angle. It is currently employed in laparoscopic POP reconstruction when surgical SUI management is necessary. Studies have demonstrated that patients undergoing the Burch procedure exhibit significantly lower overall cure rate and objective cure rate than those

undergoing MUS. Thus, the Burch procedure is not considered the first choice for surgical SUI management in patients with POP accompanied by SUI.

5. Surgical treatment of POP with OSUI

The choice between a "one-step" and a "two-step" treatment for POP accompanied by OSUI remains a matter of debate. Conducting MUS simultaneously with the surgical management of POP has shown advantages, such as reducing the risk of new-onset SUI postoperation, diminishing the need for postoperative SUI treatment, decreasing the requirements of anesthesia, and lowering medical costs. In addition, it does not affect the patient's ability to void and retain urine, nor does it compromise bladder compliance. However, this approach is associated with an increased incidence of overactive bladder, difficult urination, urine retention, urinary tract infections, and elevated risks of sling erosion and bladder perforation.[17,18]

Pelvic organ prolapse patients lacking symptoms of SUI are particularly susceptible to developing OSUI, especially in cases of anterior and central POP. Preoperatively, prolapsed tissues should be repositioned through the vagina before detailed examination to confirm the presence or absence of OSUI to prevent postoperative SUI.

We recommend the following methods in the formulation of the surgical plan (Fig. 1): For patients with POP in which SUI was not preoperatively confirmed, vaginal repositioning testing should be performed first. If the result is negative, SUI surgery is not necessary. If the result is positive, the strategy should be formulated considering whether the patient has a previous history of SUI. For patients with a confirmed history of SUI that resolved with increasing prolapse and for those without a history of SUI who do not wish to undergo a second operation, simultaneous SUI surgery can be performed. In summary, patients with POP accompanied by OSUI should be examined on an individual basis to weigh the risks and benefits, the surgical procedure should be carefully selected, and communications with the patient and family members should be timely and thorough.

If simultaneous SUI surgery is deemed necessary, the primary options include both the Burch procedure and MUS, with the choice dependent on the surgical approach for POP (transabdominal or transvaginal). Notably, the efficacy of MUS is better than that of the Burch procedure, and the effectiveness of MUS via the retropubic approach or the transobturator approach is comparable.

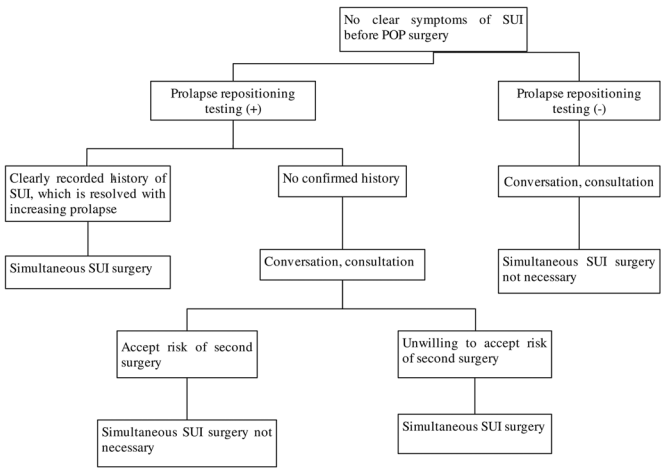

Figure 1. Diagnostic flowchart for POP accompanied by OSUI. OSUI = occult stress urinary incontinence; POP = pelvic organ prolapse; SUI = stress urinary incontinence.

6. Prevention and surveillance

6.1. Prevention

Pelvic organ prolapse and SUI have the same epidemiological risk factors and therefore similar preventive measures.

1. Improving health during pregnancy and the postpartum period through interventions such as weight control and PFMT exercises combined with breathing exercises.[19]
2. Avoiding activities that increase IAP, such as managing constipation and minimizing intense physical activity.
3. Controlling body weight, avoiding/quitting smoking, and maintaining nutritional balance.
4. Postmenopausal patients can undergo appropriate hormone replacement therapy after evaluation by a physician, thus improving overall health and managing symptoms of genitourinary syndrome of menopause.

6.2. Surveillance

Surveillance of patients with POP accompanied by SUI should include the following:

1. Follow-up for conservative treatment: At 3–6 months of treatment, follow-up should include a 72-hour voiding diary, a 1-hour urine pad test, pelvic floor muscle myoelectric testing, the International Consultation on Incontinence Questionnaire—Urinary Incontinence Short Form, and urodynamic testing if necessary.[20]
2. Follow-up for surgical treatment: At 6 months postoperatively, the patient should be examined for short-term complications such as infection, bleeding, and tissue injury. After 6 months, the patient should be examined for long-term complications and efficacy of surgical treatment. Follow-up examination should include a 72-hour voiding diary, a 1-hour urine pad test, the International Consultation on Incontinence Questionnaire—Urinary Incontinence Short Form, Pelvic Floor Distress Inventory-20, Pelvic Organ Prolapse Distress Inventory-6, Urinary Distress Inventory-6 Colorectal-Anal Distress Inventory-8, Pelvic Floor Impact Questionnaire-7, the American Urological Association Symptom Score, and other questionnaires, as well as urodynamic testing, B-scan ultrasound of the pelvic floor, cystography, and other examinations as necessary to evaluate bladder function and mechanical recovery of the pelvic floor. Patients with mesh exposure should be referred to a trained and experienced pelvic floor specialist for further diagnosis and treatment.[21] The use of standardized Category, Time and Site terminology and standardized documentation for complications is recommended to facilitate future management and referral.

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Statement of ethics

Not applicable.

Conflict of interest statement

The authors declare no conflicts of interest statement.

Author contributions

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Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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