

TUGA guideline for female lower urinary tract dysfunction

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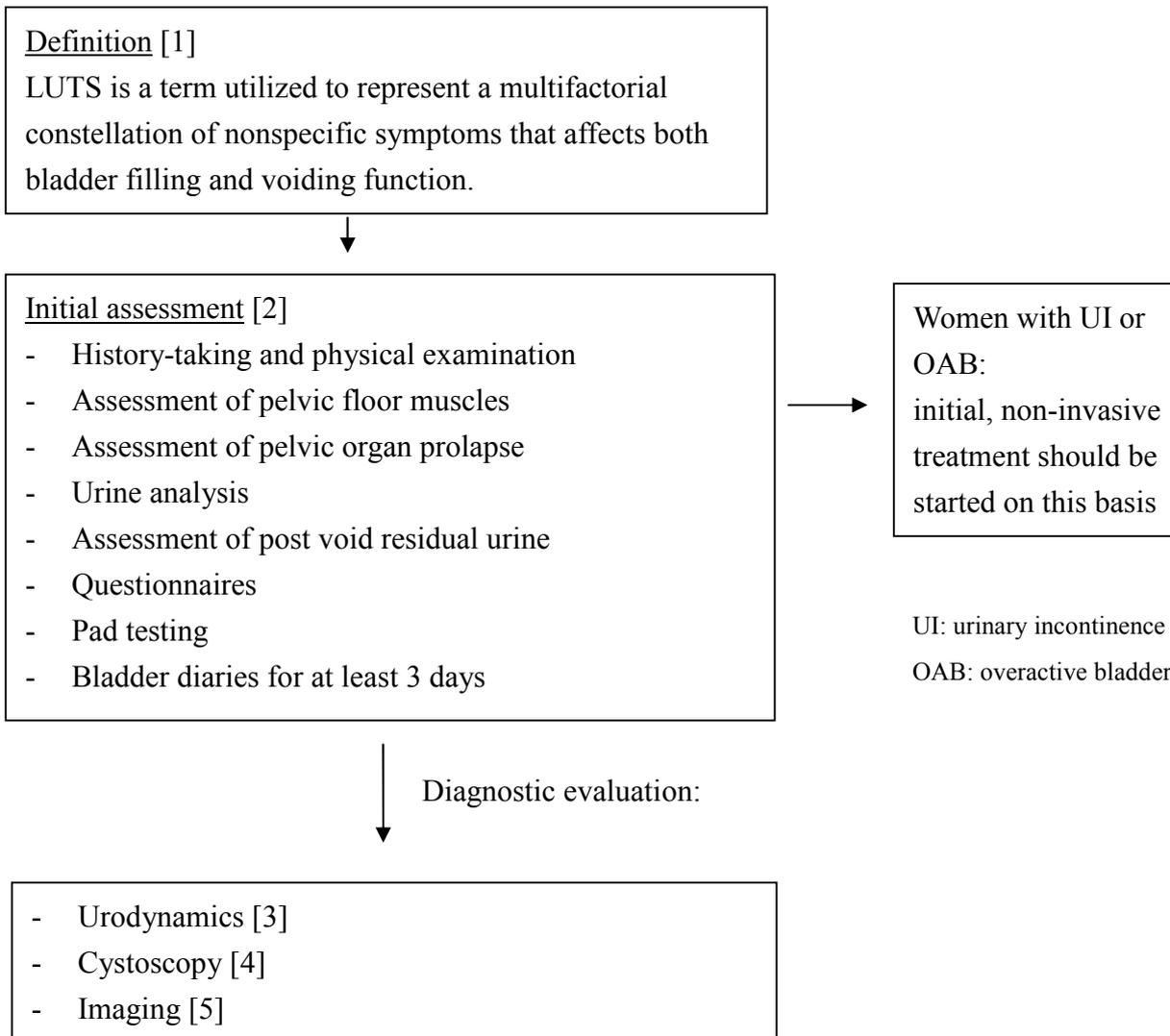
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Evaluation of lower urinary tract symptoms (LUTS)

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Evaluation of LUTS in Female



[1] Definition of lower urinary tract symptoms (LUTS):

According to the definition of LUTS in American Urological Association (AUA)/ Society of Urodynamics Female Pelvic Medicine & Urogenital Reconstruction (SUFU) Guideline 2012:

1. Filling LUTS (irritative symptoms) include urinary frequency, urgency, incontinence and nocturia.
2. Voiding LUTS (obstructive symptoms) include slow stream, hesitancy, intermittency, incomplete bladder emptying and post-void or terminal dribbling.

Irritative LUTS may co-exist with obstructive LUTS and may cloud the assessment, thereby making diagnosis difficult.

[2] Initial assessment:

1. History-taking and physical examination

At the initial clinical assessment, the woman's UI should be categorized as stress UI, mixed UI, or urgency UI/OAB. Initial treatment should be started on this basis.

2. Assessment of pelvic floor muscles

Routine digital assessment of pelvic floor muscle contraction should be undertaken before the use of supervised pelvic floor muscle training for the treatment of UI.

3. Assessment of prolapse

Women with UI who have symptomatic prolapse that is visible at or below the vaginal introitus should be referred to a specialist.

4. Urine analysis

A urine dipstick test should be undertaken in all women presenting with UI to detect the presence of blood, glucose, protein, leucocytes and nitrites in the urine.

Women with symptoms of urinary tract infection (UTI) whose urine tests positive or negative for both leucocytes and nitrites should have a midstream urine specimen sent for culture and analysis of antibiotic sensitivities. An appropriate course of antibiotic treatment should be prescribed pending culture results.

Women who do not have symptoms of UTI, but whose urine tests positive for both leucocytes and nitrites, should not be offered antibiotics without the results of midstream urine culture.

5. Assessment of residual urine

The measurement of post-void residual volume by bladder scan or catheterization should be performed in women with symptoms suggestive of voiding dysfunction or recurrent UTI. A bladder scan should be used in preference to catheterization on the grounds of acceptability and lower incidence of adverse events.

Women who are found to have a palpable bladder on bimanual or abdominal examination after voiding should be referred to a specialist.

6. Questionnaires

The following questionnaires are recommended for the assessment of the patients' perspective of symptoms of LUTS and their impact on quality of life:

Urogenital Distress Inventory (UDI-6), Incontinence Impact Questionnaire (IIQ-7), Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12), International Consultation on Incontinence (ICI-Q)...etc.

7. Pad testing

Pad tests are not recommended in the routine assessment of women with UI.

8. Bladder diaries for at least 3 days

Bladder diaries should be used in the initial assessment of women with UI or OAB. Women should be encouraged to complete a minimum of 3 days of the diary covering variations in their usual activities, such as both working and leisure days.

[3] The use of urodynamic testing is not recommended before starting conservative treatment.

The 2012 AUA guideline regarding the use of urodynamic testing in common LUTS:

1. Clinicians may perform PVR in patients with LUTS as a safety measure to rule out significant urinary retention both initially and during follow up. (*Clinical Principle*)
2. Uroflow may be used by clinicians in the initial and ongoing evaluation of patients with LUTS when an abnormality of voiding/emptying is suggested. (*Recommendation*; Evidence Strength: *Grade C*)
3. Clinicians may perform multi-channel filling cystometry when it is important to determine if detrusor overactivity (DO) or other abnormalities of bladder filling/urine storage are present in patients with LUTS, particularly when invasive, potentially morbid or irreversible treatments are considered. (*Expert Opinion*)
4. Clinicians may perform pressure-flow study (PFS) in women when it is important to determine if obstruction is present. (*Option*; Evidence Quality: *Grade C*)
5. Clinicians may perform videourodynamics in properly selected patients to localize the level of obstruction, particularly for the diagnosis of primary bladder neck obstruction. (*Expert Opinion*)

[4] Although routine cystourethroscopy is not recommended, LUT endoscopy is highly recommended:

1. When initial testing suggests other pathologies, for example, hematuria.
2. When pain or discomfort features in the patient's LUTS: these may suggest an intravesical lesion.
3. When appropriate in the evaluation of vesicovaginal fistula, extra-urethral urinary incontinence and history of anti-incontinence surgery.

[5] Several recommendations were made on the basis of an evaluation of the scientific literature as well as expert opinion:

1. Radiographic evaluation, including ultrasound scanning and cystourethrography, are not indicated in the evaluation of uncomplicated stress, urge or mixed urinary incontinence in the female.

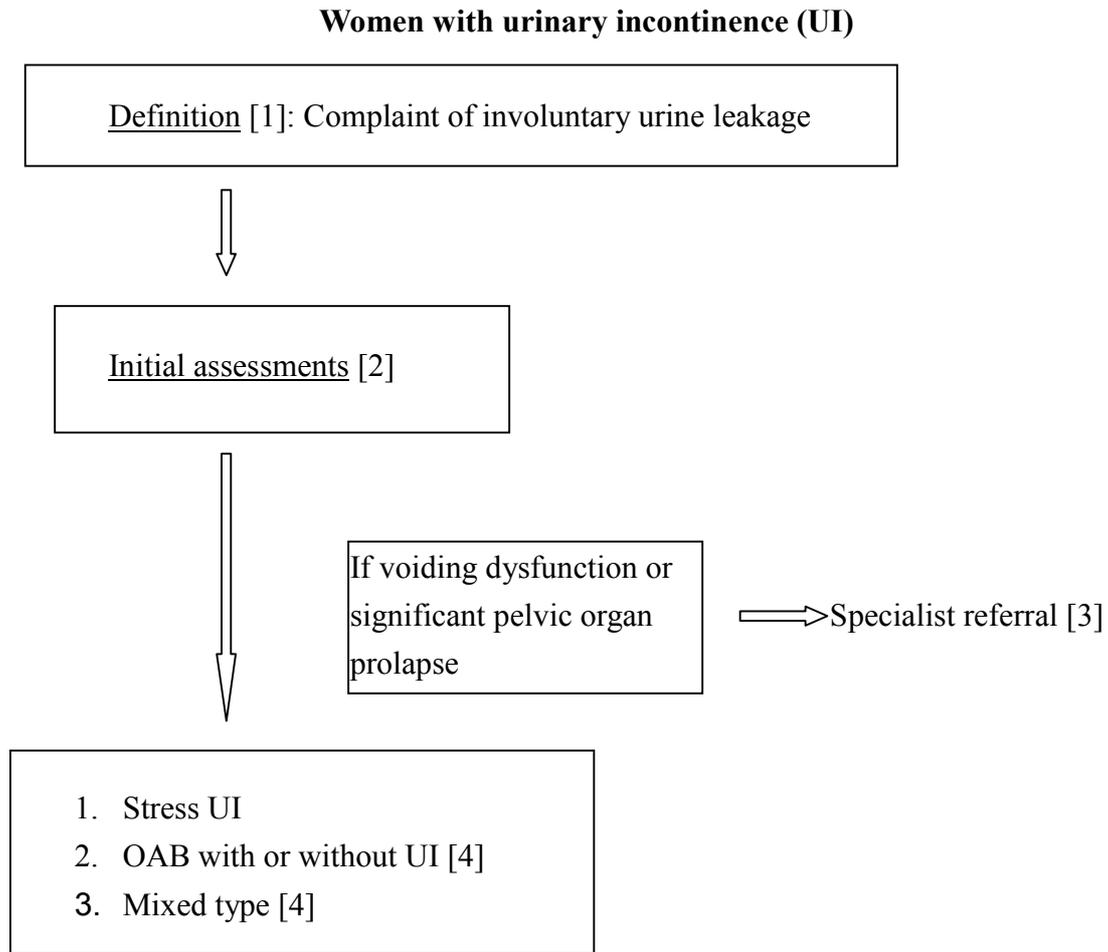
2. For patients with complicated or recurrent urinary incontinence, cystourethrography is considered an optional test.
- 3 Lower urinary tract and pelvic ultrasound scanning is considered to be an investigational imaging technique in the evaluation of urinary incontinence.

Upper urinary tract imaging is recommended in the following circumstances: (1) in patients with neurogenic voiding dysfunction associated with a high risk of renal damage (i.e. poor compliance, etc.); (2) chronic urinary retention; (3) untreated severe urogenital prolapse; and (4) suspected extraurethral urinary incontinence (ureteral ectopy, etc.).

MRI was not indicated for the clinical evaluation of urinary incontinence or in patients with vaginal prolapse. Application of MRI in the female has been in the investigation of periurethral masses, including urethral diverticula.

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[1] Definition of Urinary incontinence (UI):

1. Stress urinary incontinence
 - Involuntary urine leakage on effort or exertion or when coughing or sneezing.
2. Urgency urinary incontinence
 - Involuntary urine leakage associated with or immediately preceded by urgency.
3. Overactive bladder syndrome
 - Urgency with or without urgency incontinence usually accompanied with complaints of frequency and nocturia.
4. Mixed urinary incontinence
 - Involuntary urine leakage associated w/ both urgency and with exertion, effort, coughing or sneezing.

[2] Initial assessment:

1. Medical, Drug History (alpha-blocker, ACE-inhibitor, diuretics, alcohol), Surgical History.
2. Voiding Diary (at least 3 days), including frequency, volume and time incontinence, and precipitants to UI (e.g. Cough).
3. Measure Quality of life impacts (OAB-q, King's health Questionnaire, OABSS).
4. Post void residual urine.
5. Urine dipstick tests to detect blood, glucose, protein, leucocytes and nitrites.
6. Vaginal examination: assessment pelvic floor muscle, vaginal atrophy and prolapse.
7. Physical examination: abdomen, pelvic and sacral neurological status.

[3] Specialist referral:

1. Urgently refer women with any of the following:
 - Microscopic hematuria if aged 50 years and older
 - Visible hematuria
 - Recurrent or persisting UTI associated with hematuria if aged 40 years and older
2. Suspected pelvic mass arising from the urinary tract
3. Refer women with:
 - Symptomatic prolapse visible at or below the vaginal introitus
 - Palpable bladder on bimanual or physical examination after voiding.
4. Consider referring women with:
 - Persisting bladder or urethral pain
 - Clinically benign pelvic masses
 - Associated fecal incontinence
 - Suspected neurological disease
 - Voiding difficulty
 - Suspected urogenital fistulae
 - Previous continence surgery
 - Previous pelvic cancer surgery
 - Previous pelvic radiation therapy

[4] Treatment of OAB with or without UI

1. Life style Medication

- Caffeine reduction/ weight loss
- Bladder training lasting at least 6 weeks. If frequency remains troublesome, consider adding an antimuscarinic drug.

2. Pelvic floor muscle training (PFME)

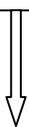
- Kegel's exercise (pelvic floor muscle training; PFMT and Biofeedback)

3. Medication

- Anti-muscarinic drugs: [5]
 - Side effects: GI effects, ophthalmic effects, CNS effects, CV effects, GU effect and others.
 - Oxybutynin (Ditropan 5mg tid,qid), Solifenacin (Vesicare 5mg qd), Tolterodine (Detrusitol 2mg bid, 4mg qd), Uridin 2mg bid, Urotrol 15mg bid, Oxbu 5mg qd/bid.

4. In postmenopausal women with vaginal atrophy, offer intravaginal oestrogens for OAB symptoms.

5. In women with UI who also have cognitive impairment, prompted and timed toileting program may help reducing leakage episodes.



Further assessments [6]

Other treatments [7]

[5] Anti-muscarinic drugs:

1. Adverse side effect:

- GI effects (dry mouth, constipation); Ophthalmic effects (Blurred vision, dry eyes); CNS effects(drowsiness, headache); CV effects (palpitations, arrhythmias, tachycardia); GU effect (urinary retention); Others effects (angioedema, skin reactions).

2. Special instructions:

- Avoid in patients with urinary retention, gastric retention, uncontrolled narrow-angle glaucoma and in patients at risk for these conditions.

- Use with caution in patients with GI obstructive disorders, severe constipation, ulcerative colitis, myasthenia gravis, controlled narrow-angle glaucoma.
- Use with caution in patients with significant bladder outflow obstruction.

[6] Further assessments:

- Use multi-channel filling and voiding cystometry before surgery for UI if:
 - There is clinical suspicion of detrusor overactivity.
 - There has been previous surgery for stress UI or anterior compartment prolapse.
 - There are symptoms of voiding dysfunction.
- Ambulatory urodynamics or videourodynamics may be considered before surgery for UI.

[7] Other treatments:

- Discuss the risks and benefits of surgical and non-surgical options. Consider the woman's child-bearing desire during the discussion.
- If conservative treatments have failed, consider:
 - Botulinum toxin A to treat idiopathic detrusor overactivity in those willing and able to self-catheterization.
 - **Neuromodulation:** Sacral nerve stimulation for UI due to detrusor overactivity.
 - Augmentation cystoplasty in those willing and able to self-catheterization.
 - Urinary diversion if sacral nerve stimulation and augmentation cystoplasty are not appropriate or unacceptable.

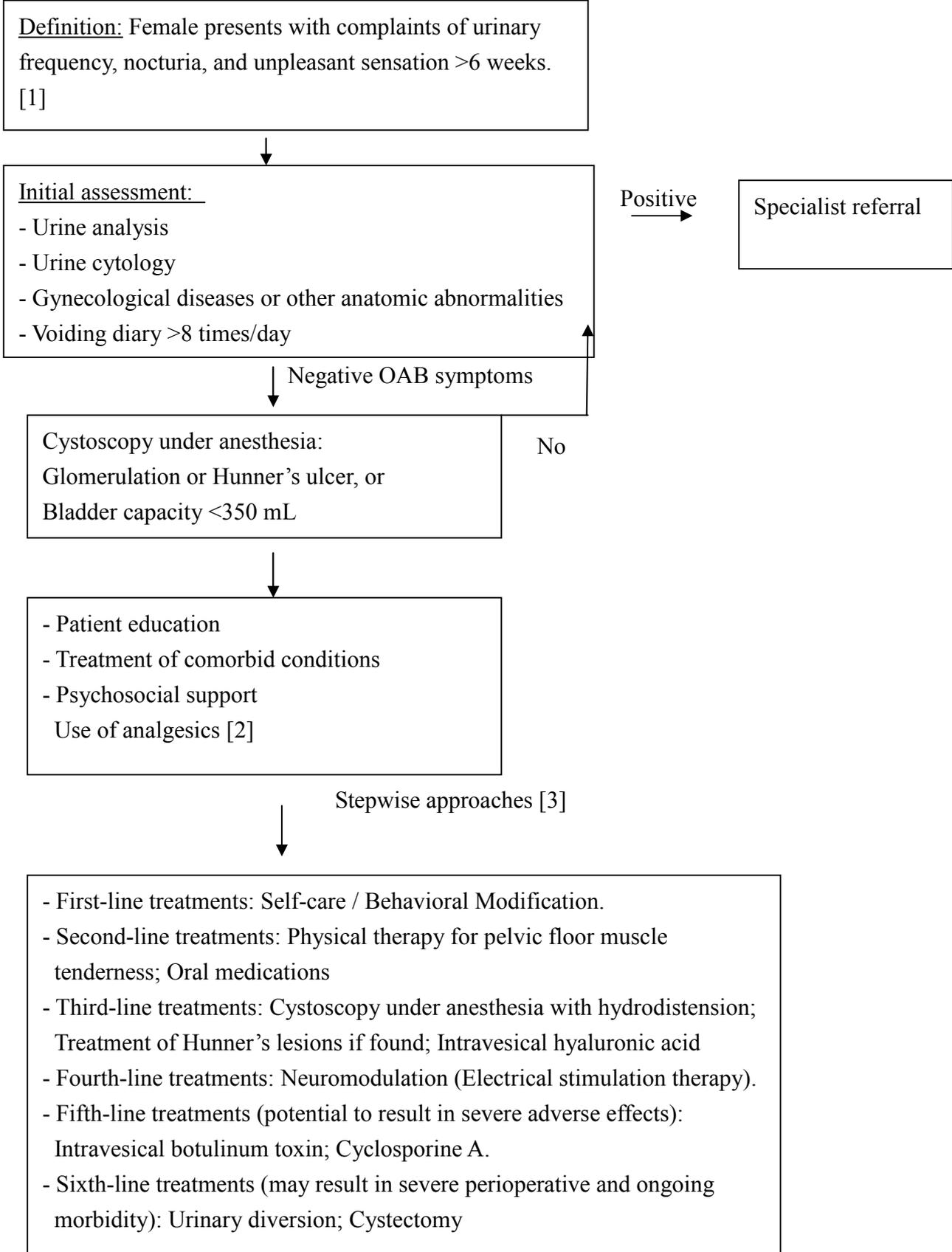
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Interstitial Cystitis/Painful Bladder Syndrome(IC/PBS)

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IC/PBS in Female



[1] Definition of Interstitial Cystitis/Painful Bladder Syndrome(IC/PBS):

According to the definition of IC/PBS in 2009 Annual SUFU Conference, the main symptom is unpleasant sensation including pain, pressure, and discomfort and which is perceived to be related to the bladder. Associated symptoms are lower urinary tract symptoms. The duration of the symptoms lasts over six weeks. Infection or other identifiable causes must be excluded.

[2] Use of analgesics:

1. Urinary analgesics: phenazopyridine: short-term use
2. Oral and transdermal analgesics
3. Intravesical lidocaine: for acute episode of severe bladder pain
 - lidocaine with heparin and/or sodium bicarbonate (office, at home)

[3] Stepwise approach

In 2011 the American Urological Association (AUA) completed guidelines on the treatment of IC/PBS.

Clinical management principles including:

1. First-line treatments: Self-care / Behavioral Modification.
 - Application of local heat or cold
 - Avoidance of activities or food or beverages that exacerbate symptoms
 - Fluid management: no more than 2L/day (maintain a pale yellow color urine)
 - Bladder training (timed voiding-“void by the clock”)
2. Second-line treatments:
 - Physical therapy for pelvic floor muscle tenderness
 - Oral medications:
 - Amitriptyline (TCA): soon, at higher doses (50mg daily)
 - Hydroxyzine (Antihistamines): allergic disorders, insomnia
 - PPS (Elmiron): FDA, 3-6 months after initiation, GAG layer
 - Cimetidine (H2 receptor antagonists): antiinflammatory effect
3. Third-line treatments: Cystoscopy under anesthesia with hydrodistension; Treatment of Hunner’s lesions if found; Intravesical hyaluronic acid; bladder instillation cocktail.
4. Fourth-line treatments: Neuromodulation (Electrical stimulation therapy); Acupuncture.
 - Sacral neuromodulation (SNM): FDA for OAB, not for IC/BPS
 - Acupuncture
5. Fifth-line treatments (potential to result in severe adverse effects):
 - Intravesical botulinum toxin (BoNT): no FDA, risk of urinary retention, the ability of BoNT to modulate sensory neurotransmission
 - Cyclosporine A (Immunosuppressant)
6. Sixth-line treatments (may result in severe perioperative and ongoing morbidity):
 - Urinary diversion with or without cystectomy, pelvic pain may persist

- NOTE: For patients with end-stage structurally small bladders, diversion is indicated at any time clinician and patient believe appropriate

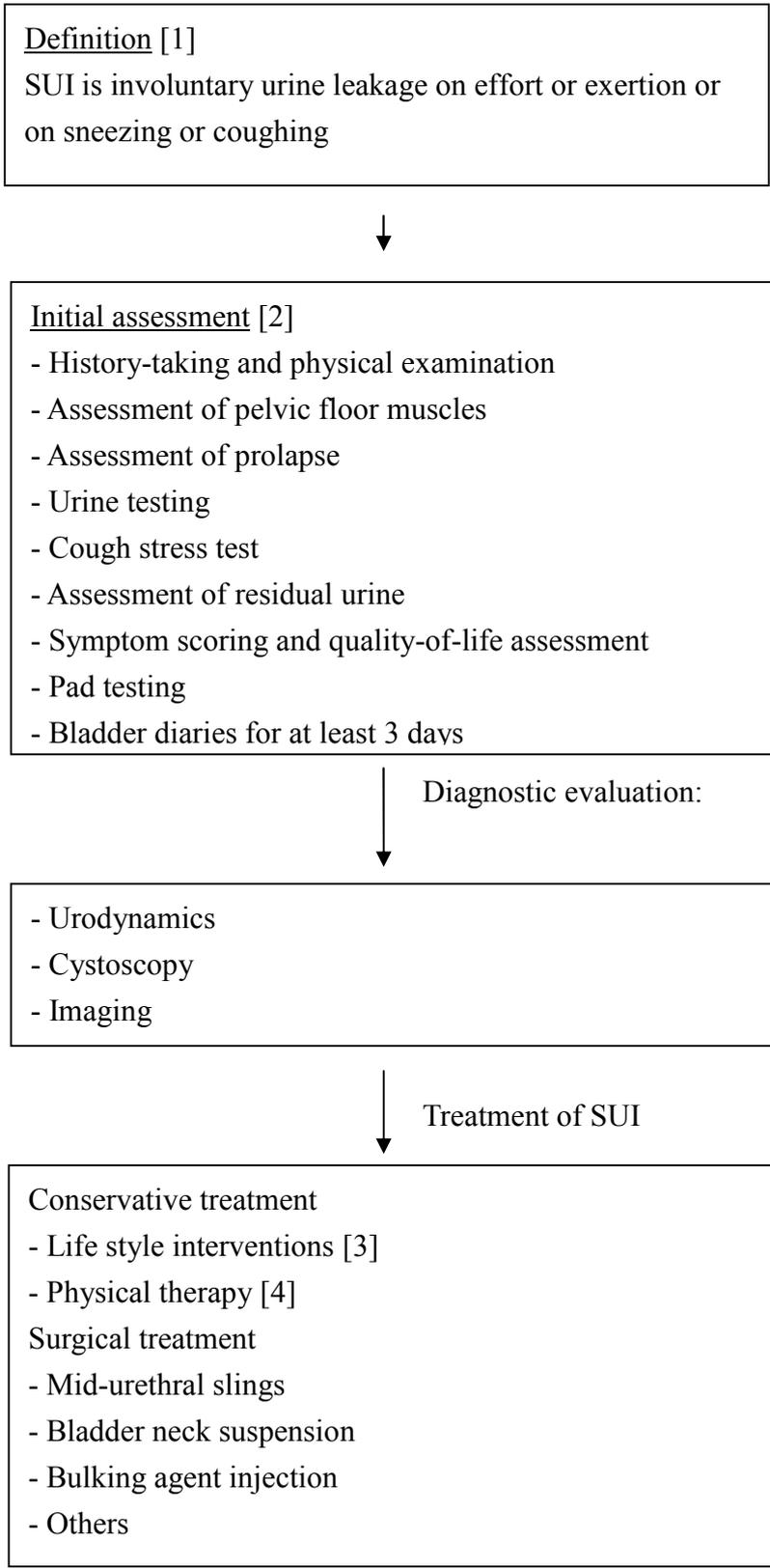
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Conservative treatment of stress urinary incontinence (SUI)

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Evaluation and treatment of SUI in female



[1] Definition:

Stress urinary incontinence is involuntary urine leakage on effort or exertion or on sneezing or coughing.

[2] Initial assessment:

1. History-taking and physical examination
2. Assessment of pelvic floor muscles
3. Assessment of prolapse
4. Urine testing
5. Assessment of residual urine
6. Symptom scoring and quality-of-life assessment
7. Pad testing
8. Bladder diaries for at least 3 days

[3] Lifestyle interventions: Maintaining weight within a healthy range has been shown to reduce the severity of SUI problems; avoiding causes of constipation and cutting out smoking can also help.

1. Weight loss: Weight loss is an acceptable treatment option for morbidly obese women with incontinence. (Recommended; Evidence strength: Grade A). Advise women with incontinence who have a body mass index (BMI) greater than 30 to lose weight
2. Smoke (Optional; Evidence strength: Grade C)
3. Alcohol (Optional)
4. Caffeine consumption (Optional)
5. Physical force (Heavy-lifting jobs) (Optional)
6. Constipation (Optional)

[4] Physical therapy: can be a very effective way of improving symptoms of SUI. Up to 75 % of women show an improvement in leakage after pelvic floor muscle training. Like all training, the benefits of pelvic floor exercises are maximized if practice is carried out regularly over a period of time. Maximum benefit usually occurs after 3 to 6 months of regular exercising.

1. Pelvic floor muscle training (PFMT): PFMT is better than no or placebo treatment for women with stress, urge or mixed incontinence (Recommended; Evidence strength: Grade A) (1). There is no sufficient evidence of the effect of PFMT versus electrical stimulation or weighted vaginal cones.

Recommended PFMT program: 3 sets of 8-12 slow and quick velocity maximal pelvic floor muscle contraction for 15-20 weeks (2)

2. Biofeedback assisted PFMT: Biofeedback is a way to monitor how well patients are doing the pelvic floor muscle training by giving feedback as patients do them. There are several different methods of biofeedback:

- A small probe could be inserted into the vagina. This senses when the muscles are squeezed and feeds the information to a computer screen.
- Electrodes (sticky electrical patches) could be attached to the skin of abdomen or around the anus. These sense when the muscles are squeezed and feed the information to a computer screen.

A recent Cochrane systematic review, which included 24 trials involving 1584 women with urinary incontinence, evaluated the effectiveness of adding biofeedback to PFMT. Women who received biofeedback were significantly more likely to report that their urinary incontinence was cured or improved compared to those who received PFMT alone (risk ratio 0.75, 95% confidence interval 0.66 to 0.86) (3). Biofeedback assisted PFMT is more effective than PFMT alone (Recommended; Evidence strength: Grade A)

3. Weighted vaginal cones: Vaginal cones may be used by women to assist with pelvic floor muscle training. Vaginal cones are small weights that are inserted into the vagina. Patients hold the weights in place using pelvic floor muscles. When patients can, progress to the next vaginal cone, which weighs more.

Weighted vaginal cones training is better than placebo (no treatment) for women with stress, urge or mixed incontinence (Recommended; Evidence strength: Grade A)

4. Electrical stimulation (ES): Electrical stimulation either vaginal or extracorporeal is a modality which has been in clinical use in Europe and North America for three decades. Several early uncontrolled trials reported efficacy in urinary incontinence treatment, with improvement rates from 35% to 70% (4), whereas in controlled trials the results were conflicting and no additional benefit over PFMT was demonstrated (5).

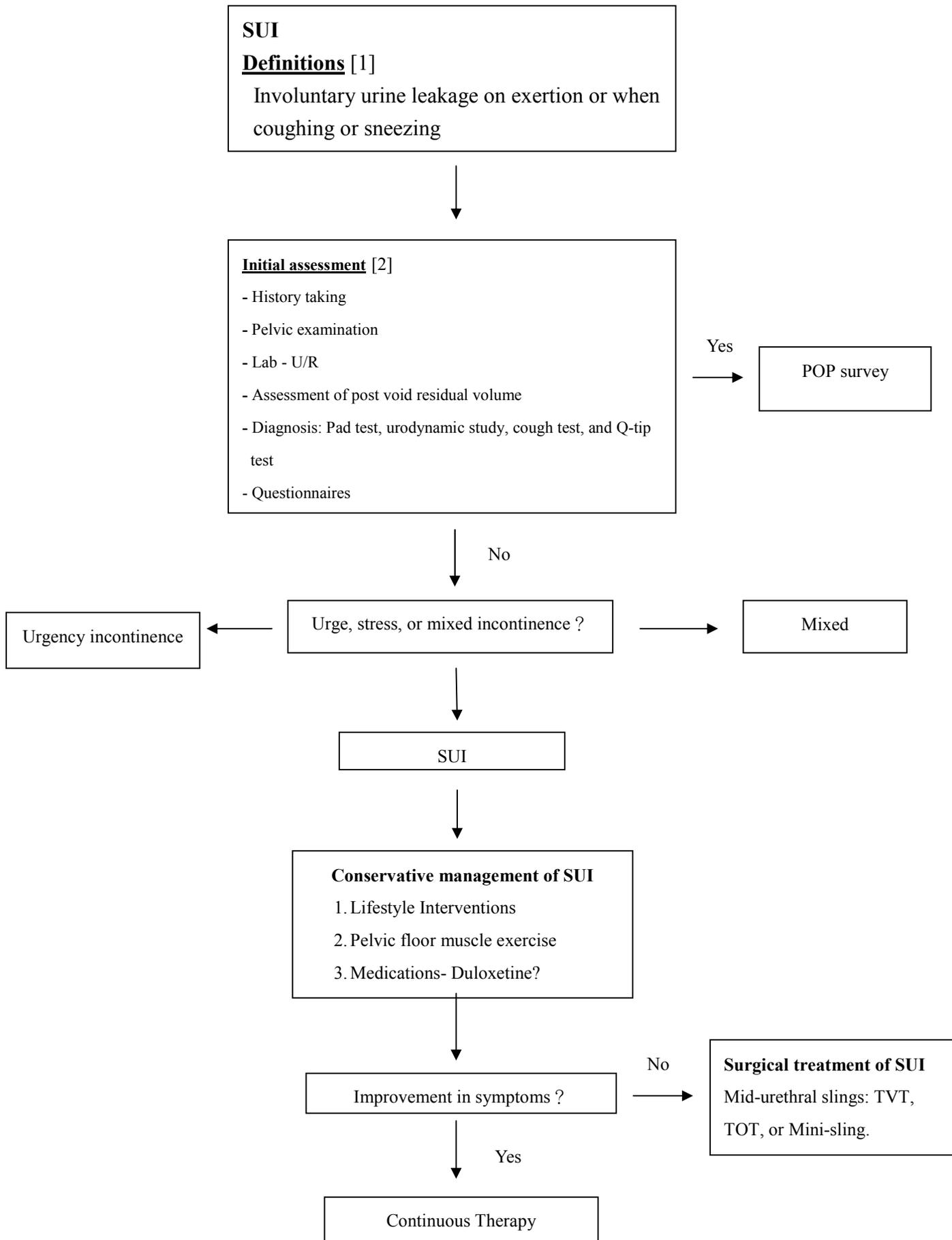
If patients are unable to contract pelvic floor muscles, using a device that measures and stimulates the electrical signals in the muscles may be recommended. A small probe will be inserted into the vagina. An electrical current runs through the probe, which helps to strengthen pelvic floor muscles while patients exercise them.

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Surgical treatment of stress urinary incontinence (SUI)

龍震宇 醫師



[1] Definitions:

Involuntary urine leakage on exertion or when coughing or sneezing

[2] Initial assessment

1. History taking

- Pregnancies & mode of delivery
- Past surgeries, bowel (including constipation & fecal incontinence)
- Drug history- drugs causing SUI
 - Alpha blockers (Prazosin, Terazosin, Doxazosin)
 - ACE inhibitors if they induce cough.
 - Loop diuretics & alcohol may overwhelm ability to reach the bathroom in time.
- Risk Factors
 - Ageing, pregnancy, childbirth, menopause, high BMI, multiple parity, pelvic surgery and radiation therapy, α -adrenoreceptor blocking agents, history of smoking & chronic obstructive pulmonary disease can aggravate SUI.

2. Pelvic examination

- General neurologic examination
- Sensory status: Impairment of perineal sacral area sensation helps localize the level of neurologic deficit.
- Reflex: A bulbocavernous reflex implies the integrity of sacral 2-4 spinal cord segments.
- POP if evident, is staged.

3. Laboratory tests: Urinalysis or urine culture

- If infection found, treat then reassess.

4. Post void residual volume

- Consider if patient has symptoms of voiding dysfunction or history of recurrent urinary tract infection
Catheterization or bladder scan.

[3] Diagnosis

1. Pad test - 20 min, 1-hour, 24-hour test

2. Urodynamic Study

- Urine leakage when cough during filling cystometry
- Valsalva leak point pressure <60 cmH₂O implies intrinsic sphincter deficiency (ISD)

3. Videourodynamic studies: sophisticated combination of fluorocystourethrography and urodynamic studies mentioned above.

4. Cough stress test - Vaginal examination with comfortably full bladder. Direct observation of urine loss using cough stress test

5. Q-tip test: A lubricated Q-tip is inserted to proximal urethra and ask patient to strain. A rotational angle of greater than 30 degrees is indicative of urethral hypermobility.

6. Questionnaires

- Impact on quality of life, Urogenital Distress Inventory (UDI-6), Incontinence Impact Questionnaire

(IIQ-7), Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12), International Consultation on Incontinence (ICI-Q).

Surgical treatment of SUI

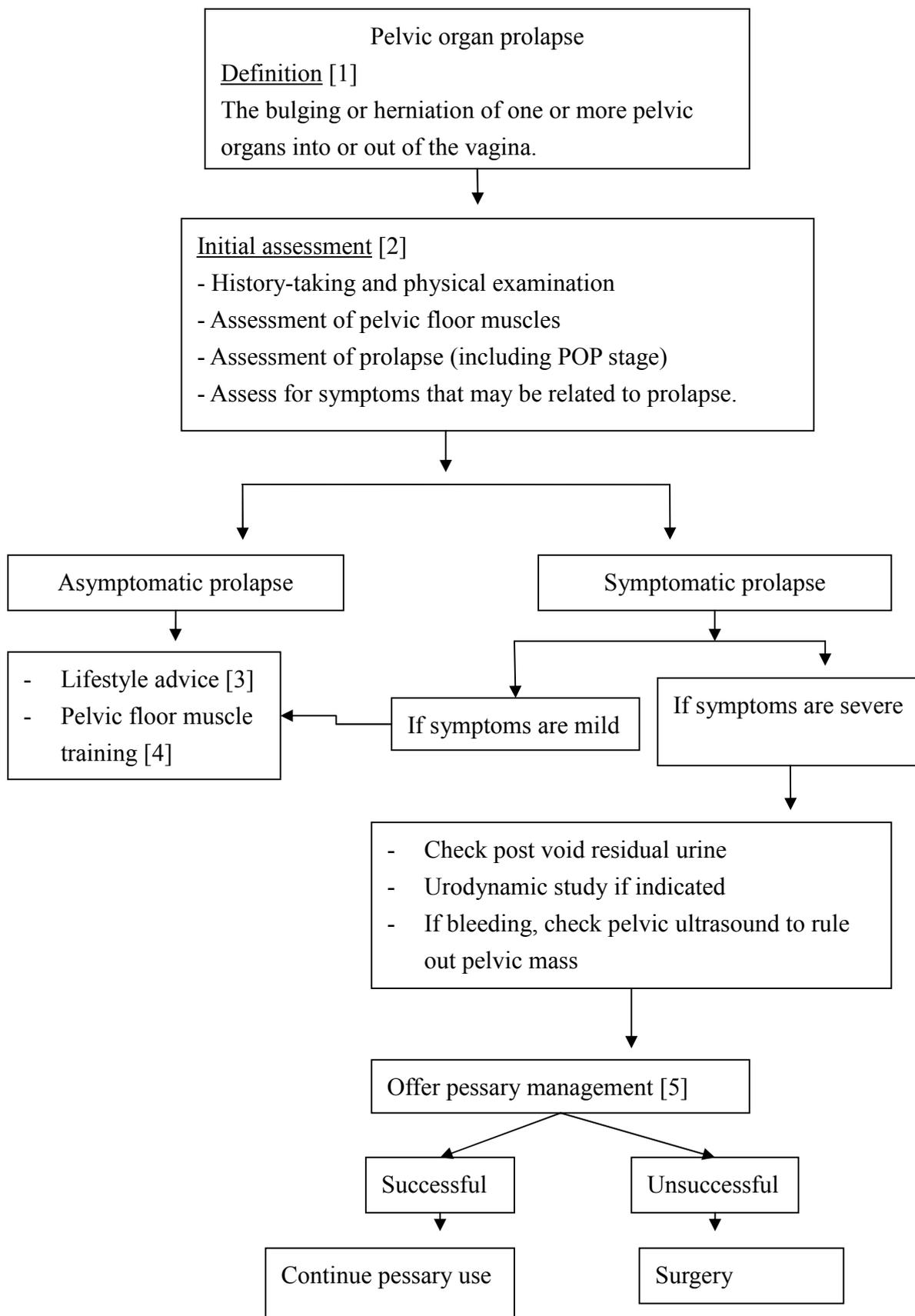
- Provides more successful and sustained outcome.
- Midurethral slings: TVT, TOT, Mini-sling.

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Conservative management for pelvic organ prolapse

許鈞碩 醫師



[1] Definition of pelvic organ prolapse (POP)

According to the IUGA-ICS joint report on the terminology

POP: The descent of one or more of the anterior vaginal wall, posterior vaginal wall, the uterus (cervix), or the apex of the vagina (vaginal vault or cuff scar after hysterectomy).

The presence of any such sign should be correlated with relevant POP symptoms.

More commonly, this correlation would occur at the level of the hymen or beyond.

[2] Initial assessment

1. History taking

- The prolapse symptoms and low urinary and gastrointestinal tract symptoms.

2. Assessment of pelvic floor muscles

- Routine digital assessment of pelvic floor muscle contraction should be undertaken before the use of supervised pelvic floor muscle training for the treatment of UI.

3. Assessment of prolapse

- Use POP-Q stage

4. Assess for symptoms that may be related to prolapse

- Prolapse symptoms

- Vaginal bulging: complaint of a “bulge” or “something coming down” towards or through the vaginal introitus.
- Pelvic pressure: complaint of increased heaviness
- Bleeding, discharge, infection: complaint of vaginal bleeding, discharge, or infection related to dependent ulceration of the prolapse.
- Splinting/digitation: complaint of the need to digitally replace the prolapse or to otherwise apply manual pressure, e.g. to the vagina or perineum (splinting), or to the vagina or rectum (digitation) to assist voiding or defecation.
- Low backache: complaint of low, sacral backache may be associated temporally with POP.

- Storage symptoms

- Voiding symptoms

- Symptoms of sexual dysfunction

- Symptoms of anorectal dysfunction

[3] Lifestyle advice

- Avoid constipation

- Weight loss

- Avoid heavy lifting

- Avoid high impact exercise

- Smoking cessation

- Avoid bladder irritants such as caffeine

[4] Pelvic floor muscle training (PFMT)

- Aims of PFMT for prolapse

- To improve pelvic floor muscle strength in order to improve structural support for the pelvic organs.
- To improve pelvic floor muscle coordination and timing, to provide pelvic organ support during increases in intra-abdominal pressure.

[5] Pessary management

- Indications for pessary use
 - Support and repositioning of prolapsed pelvic organs
 - Treatment for vaginal wind
 - Treatment of neonatal prolapse
 - Managing prolapse during pregnancy

- Relative Contraindications for pessary use

- Inability to comply with follow-up
- Dementia
- Persistent vaginal erosion

6. Choosing a pessary type and fitting

- Ring pessary with and without support
- Gellhorn pessary
- Cube pessary

7. Follow-up to initial insertion

- Patient insertion and removal.

Timing of office follow-up: two weeks after first visit, then yearly with annual examination unless new symptoms develop in the meantime.

- Clinician insertion and removal.

Timing of office follow-up: 2 weeks after first visit, then quarterly (every three months) unless new symptoms develop in the meantime.

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Surgical treatment for Female Pelvic Organ Prolapse

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Fig. 1 Flow chart for evaluation and management of patients with pelvic organ prolapse (POP)

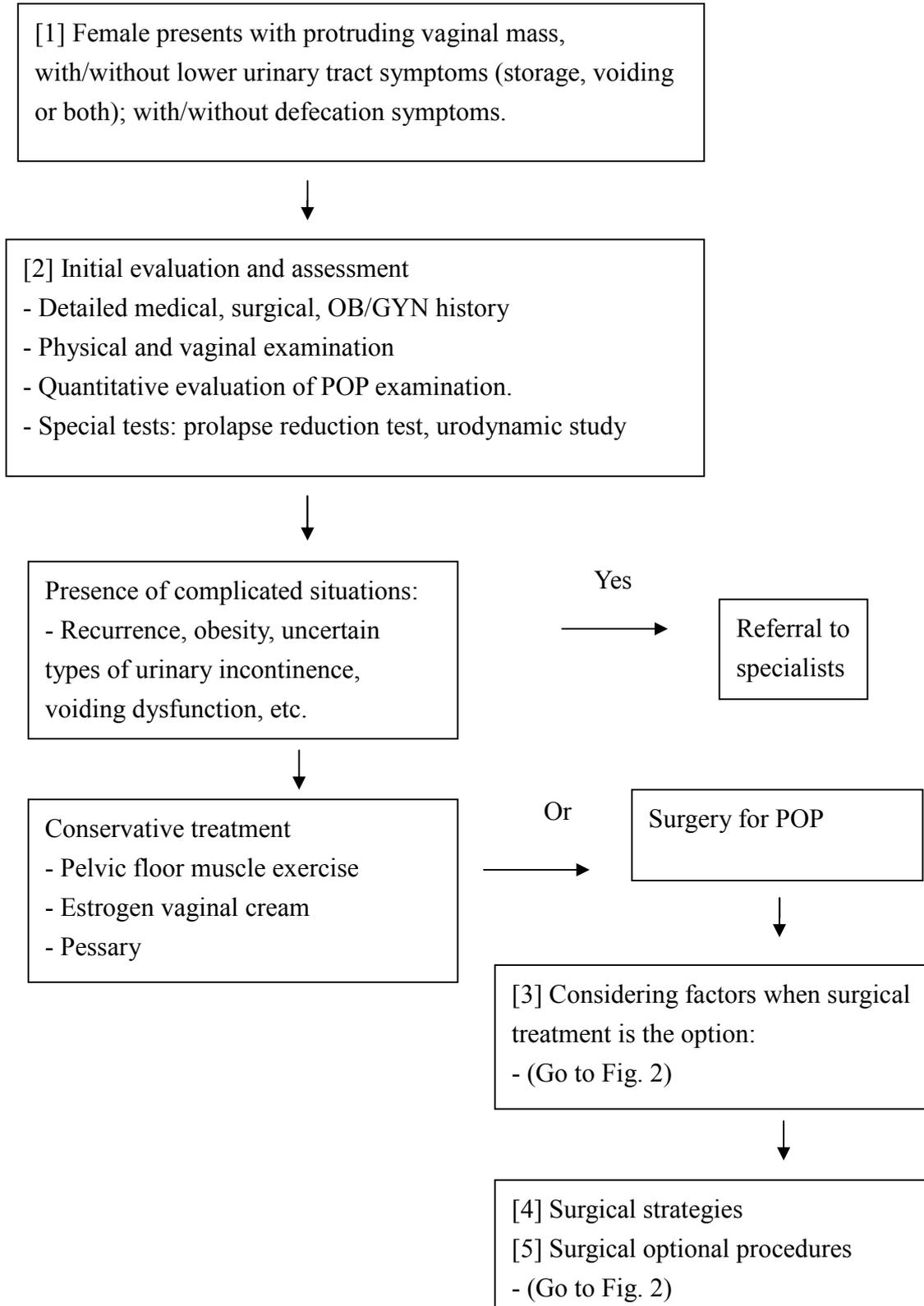
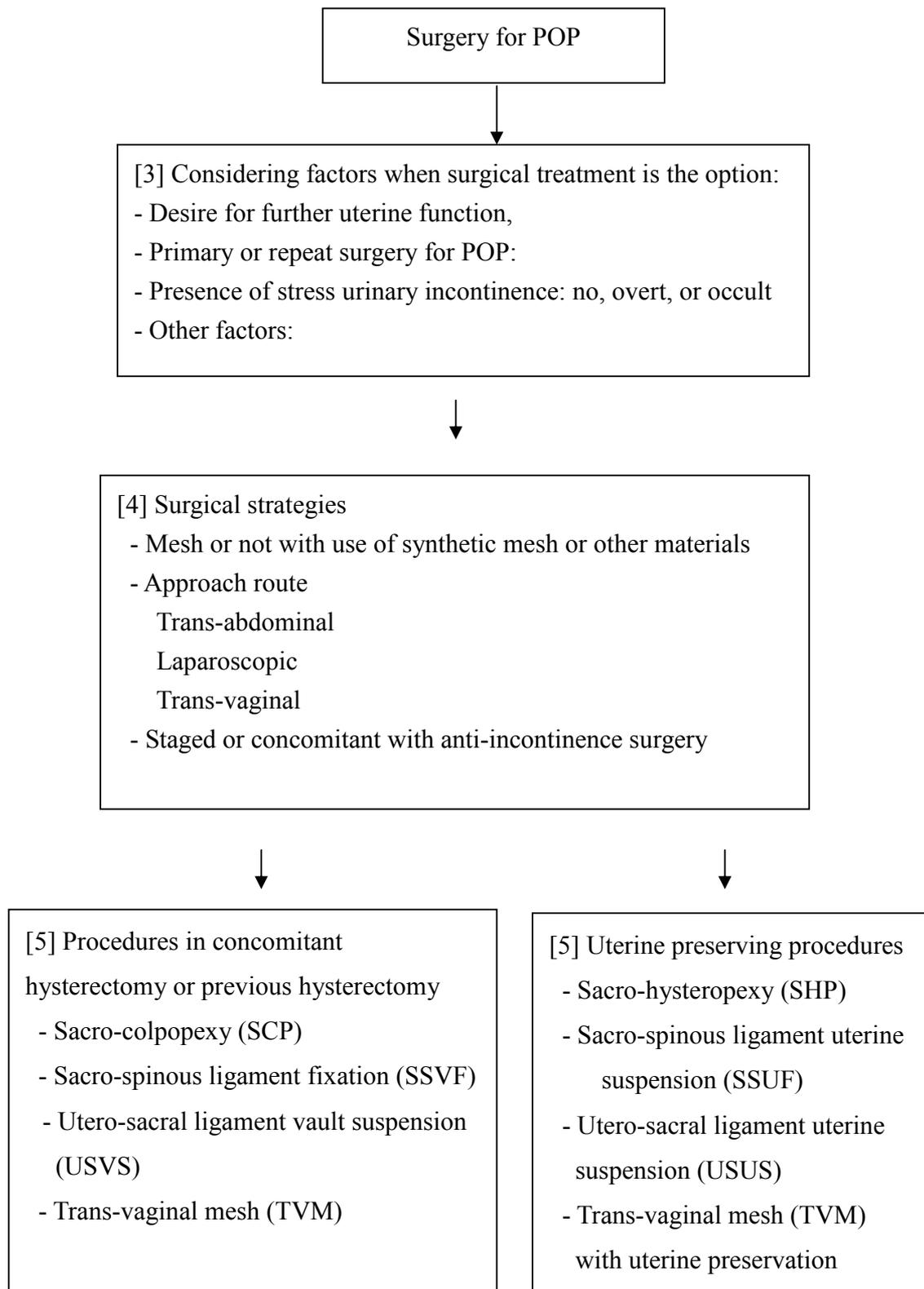


Fig. 2 Choice of surgical procedures



[1] Definition:

Pelvic organ prolapse (POP), defined as the protrusion of the vagina and pelvic organs into or beyond the vaginal introitus, can affect the anterior, posterior, and apical compartments of the vagina or a combination therefore leading to a marked impact on quality of life.

[2] Initial evaluation and assessment:

1. Detailed medical, surgical, obstetrical and gynecological history.
 - Urinary symptoms, e.g. storage, voiding and post micturition symptoms; symptoms associated with sexual intercourse, symptoms of discomfort, pain, or incontinence with sexual activity; symptoms of POP include vaginal pressure, the feeling of a lump (something coming down), low backache, heaviness, dragging sensation, or the need to digitally replace the prolapse in order to defecate or micturate (1).
 - Bowel function symptoms, e.g. frequency, consistency, and constipation.
2. Physical and vaginal examination.
 - Abdominal examination: abdominal palpation or by suprapubic percussion. Pressure suprapubically or during bimanual vaginal examination may induce a desire to pass urine (2).
 - Perineal/ vaginal inspection allows the description of the skin, e.g. the presence of atrophy or excoriation, any abnormal anatomical features and the observation of incontinence (2). Stress test is a simple method to document the condition of stress urinary incontinence (SUI) before any anti-incontinence procedure is considered.
 - Rectal examination: to observe and palpable anatomical abnormalities in anal sphincters and to assessing pelvic floor muscle function.
3. Quantitative evaluation of POP examination.
 - POP staging is defined as the descent of one or more of the anterior vaginal wall, the posterior vaginal wall, and the apex of the vagina (cervix/uterus) or vault (cuff) after hysterectomy under maximal straining. Absence of prolapse is defined as stage 0 support; prolapse can be staged from stage I to stage IV (2).
4. Special tests: prolapse reduction test, urodynamic study.
 - Multichannel urodynamics is recommended in the following situation after the office-based assessment: if there are still left with an uncertain diagnosis (for example, as a result of major discrepancies between the history, the voiding diary, and symptom scales), surgery is under consideration, the patient has hematuria in the absence of an infection, an elevated post void residual (PVR) urine, a neurological condition that may complicate treatment, e.g. multiple

sclerosis, marked POP, numerous prior surgical attempts at correction (3).

[3] Considering factors when surgical treatment is the option:

1. Desire for further uterine function.
 - Consider the attitudes toward sexuality and the psychological value of reproductive organs (uterus) among women with advanced POP (4).
2. Primary or repeat surgery for POP.
 - Mesh was more suggested in the repeat surgery for POP (5).
3. Presence of SUI: no, overt, or occult.
 - How to detect occult SUI. Prolapse reduction tests during clinical evaluation or urodynamic testing, e.g. the examiner's fingers, a large cotton swab, a single speculum blade, ring forceps, or a pessary (6).
4. Other factors include repetitive increases in intra-abdominal pressure (chronic bronchitis, chronic constipation, or other frequent Valsalva invoking conditions, such as heavy lifting); body mass index (BMI); poorly controlled diabetes and smoking.

[4] Surgical strategies:

Surgery is indicated only when the prolapse causes significant symptoms and when conservative nonsurgical managements have failed (7). There is a paucity of high-quality data comparing different types of apical prolapse, e.g. uterine prolapse repair procedures.

1. Mesh or not (8).
 - With use of synthetic mesh or other materials
 - Native tissue repair, without use of synthetic mesh or other materials

Reason for mesh: native tissue anterior repair was associated with more anterior compartment failures than in trans-vaginal mesh (TVM) (9). Mesh-related complications: The use of TVM results in higher complication rates requiring reoperation than traditional vaginal surgery and sacral colpopexy, owing to higher rates of mesh erosion and fistulae, e.g. mesh erosion or rejection 12.3% (between 5 and 15%) (10). Avoidance of concomitant hysterectomy and inverted T colpotomies can minimize the rate of complications.

Food and Drug Administration (FDA) warning about use of mesh (11): Factors to consider before using surgical mesh: 1. Surgical mesh is a permanent implant that may make future surgical repair more challenging; 2. A mesh procedure may put the patient at risk for requiring additional surgery or for the development of new complications; 3. Removal of mesh due to mesh complications may involve multiple surgeries and significantly impair the patient's quality of life; 4.

Complete removal of mesh may not be possible and may not result in complete

resolution of complications, including pain; 5. Mesh placed abdominally for POP repair may result in lower rates of mesh complications compared with trans-vaginal POP surgery with mesh.

2. Approach route.

- Trans-abdominal approach.
- Laparoscopic approach.
- Trans-vaginal approach.

3. Staged or concomitant with anti-incontinence surgery (12).

- Staged surgery
Anti-incontinent surgery after POP surgery

- Concomitant surgery

The addition of an anti-incontinence procedure at the time of surgery for POP might be beneficial in reducing postoperative SUI; however, this must be weighed against potential adverse effects. The impact of anti-incontinence surgery at the time of POP did not significantly reduce the rate of postoperative SUI (9).

[5] Surgical optional procedures:

Concomitant hysterectomy is still the standard treatment for POP may need to be further verified in modern practice.

1. Procedures in concomitant hysterectomy or previous hysterectomy.

- Sacro-colpopexy (SCP)
- Sacro-spinous ligament fixation (SSVF)
- Utero-sacral ligament vault suspension (USVS)
- Trans-vaginal mesh (TVM)

2. Uterine preserving procedures.

- Sacro- hysteropexy (SHP)
- Sacro-spinous ligament uterine suspension (SSUF)
- Utero-sacral ligament uterine suspension (USUS)
- Trans-vaginal mesh (TVM) with uterine preservation.

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