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How diabetes impacts the LUTS. What can be done?

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Global Impact of Diabetes

Diabetes is a burgeoning global health issue with significant societal costs. It is a leading cause of various severe health complications, including cardiovascular disease, blindness, kidney failure, and lower-limb amputation. Effective management of blood glucose levels, blood pressure, and cholesterol is crucial in delaying or preventing these complications.

Diabetic Bladder Dysfunction (DBD)

First described by Jordan et al. in 1935, diabetic bladder dysfunction (DBD) is characterized by decreased bladder sensation, increased bladder compliance and capacity, and impaired detrusor contractility. Common symptoms include overactive bladder (OAB) with urgency incontinence, impaired bladder emptying, urinary retention, and overflow incontinence.

Prevalence and Impact

A significant proportion of diabetic patients, ranging from 80-93%, report experiencing LUTS. DBD disproportionately affects women and remains an understudied area, necessitating further research and attention.

Clinical Phenotypes and Urodynamic Findings

Studies reveal varying prevalence rates of detrusor overactivity (DO) and detrusor underactivity (DU) among diabetic patients. The lack of standardized definitions complicates the diagnosis and understanding of these conditions.

Risk Factors

The risk of LUTS in diabetic patients increases with longer disease duration and higher HbA1c levels, highlighting the importance of early detection and management.

Differences Between Type 1 and Type 2 Diabetes

Type 2 diabetes is associated with a higher prevalence of incontinence, while Type 1 diabetes is linked to impaired sensation and contractility. These differences underscore the need for tailored approaches in managing diabetic patients.

Pathophysiology

The pathophysiology of DBD involves several factors:

- **Smooth Muscle Dysfunction**: Early stages are marked by hypercontractility, while late stages exhibit hypocontractility.
- **Urothelial Dysfunction**: Overexpression of M3 receptors and impaired sensory function are notable features.
- **Neuropathy**: Sensory and motor nerve impairment, along with NGF dysregulation, play critical roles.

Implications for Clinical Practice

Effective management of DBD in diabetic patients requires regular screening and monitoring of urinary symptoms. Future research should focus on human clinical studies to better understand and address this condition.

Conclusion

Diabetic bladder dysfunction significantly impacts a large portion of diabetic patients, with varying clinical presentations. Individualized management and early detection are essential for effective treatment and improved quality of life.

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Who Can Benefit from Pelvic Floor Muscle Exercises? How is the Evaluation Before Treatment?

Who Can Benefit from Pelvic Floor Muscle Exercises?

Pelvic floor muscle exercises (PFMEs) are an effective intervention for various pelvic floor disorders in women. They are particularly beneficial for:

1. Urinary Incontinence (UI) – PFMEs are the first-line treatment for stress urinary incontinence (SUI), urge incontinence, and mixed urinary incontinence, improving muscle strength and bladder control (Price et al., 2021).
2. Pelvic Organ Prolapse (POP) – Women with mild-to-moderate POP can benefit from PFMEs, which help reduce prolapse symptoms and delay progression (Nygaard et al., 2022).
3. Postpartum Recovery – Pregnancy and childbirth weaken pelvic muscles. PFMEs aid postpartum recovery, preventing incontinence and pelvic instability (Frawley et al., 2020).
4. Pelvic Pain and Sexual Dysfunction – Women with dyspareunia or pelvic pain benefit from relaxation-focused PFMEs, which improve muscle coordination and enhance sexual function (Berghmans et al., 2019).
5. Preventative Care – Regular PFMEs help maintain pelvic floor health, especially during pregnancy and menopause (Dumoulin et al., 2022).

Evaluation Before Treatment

A comprehensive assessment ensures proper diagnosis and treatment planning:

1. Medical History – Includes symptoms, obstetric history, lifestyle, and previous treatments. Standardized questionnaires like the Pelvic Floor Distress Inventory are useful (Price et al., 2021).
2. Physical Examination – Evaluates pelvic muscle function, using tools like the Modified Oxford Scale to assess strength (Nygaard et al., 2022).
3. Functional Assessment – Examines posture, breathing, and core stability.
4. Biofeedback and Imaging – Tools like real-time ultrasound help ensure correct muscle activation (Dumoulin et al., 2022).
5. Patient Education & Goal Setting – Ensures proper exercise technique and sets treatment goals based on individual needs.

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Outcomes of MUS surgeries for SUI among Taiwanese women

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Mid-urethral sling (MUS) operations have been the most extensively researched and widely accepted surgical treatment for stress urinary incontinence (SUI) with excellent cure rate and good safety profile. There are various types of MUS which can be offered and have evolved in technique, kit and application from retropubic approach to trans-obturator and mini-sling or single incision sling.

This review showed the evolution of MUS and its comparable therapeutic efficacy.

In this review we collated published data on MUS surgery performed among Taiwanese women with SUI in search for the best techniques and their outcomes. We reviewed 77 articles, searched using PubMed platform related to MUS in USI among Taiwanese women from 1998 to 2023. There are 24 articles totaling 2733 participants with at least a 12-month follow-up after MUS. Objective cure rate for trans-obturator tape (TOT), retropubic sling (TVT, tension vaginal tape), single incision sling (SIS) (Solyx) and SIS (MiniArc) are 80%-92%, 88%-94%, 87%-90% and 87%-91% respectively, while subjective cure is 60%-90% in TOT, 86% in SIS (Solyx) and almost 90% in SIS (MiniArc), Subsequently, we dwell into the relative few complications of each type of MUS including major complications (bladder injury, hematoma and vaginal injury) and minor complication (tape extrusion , urinary retention, UTI , voiding dysfunction, dyspareunia, groin pain, and denovo urgency, frequency).

Postoperative urinary retention (POUR) is a common consequence of urogynecologic surgery.

In our recent study of MUS in Changhua Christian Hospital, a total of 866 patients were included. The total objective cure rate of urodynamic stress incontinence was 91.7%, of which 686 patients had no POUR (79.2%), 158 had transient POUR (18.3%), and 22 had prolonged POUR (2.5%). No patient with severe POUR required a Foley catheter 2 weeks after discharge. Incidences of POUR were not significantly different between patients with and without concomitant pelvic reconstructive surgery. However, patients with SIS had a higher incidence of POUR than those with TOT ($p<0.05$). Multiple logistic regression analysis revealed that old age, previous hysterectomy, MUCP <30 cmH2O, and SIS were the risk factors for POUR. Clinicians should be aware of the risk factors for POUR and strive for adequate prevention and management.

In conclusion, MUS is the gold standard as a treatment for SUI with the best cure outcome, improvement in patient symptoms and quality of life. This procedure not only has high acceptance rate not in Taiwan, but also has promising outcome supported and endorsed internationally by IUGA Society and FIGO. Nevertheless, continuous training, monitoring of outcomes, reporting and longer-term data are still crucial to provide clearer depiction of MUS efficiency and long-term effects.

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POP Surgery: should the uterus be removed or retained, and what should be considered?

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Pelvic organ prolapse (POP) is a common gynecological condition that results from weakened pelvic floor support, often necessitating surgical intervention. A crucial decision in POP surgery is whether to **remove or retain the uterus**, as both options have significant implications for anatomical integrity, surgical outcomes, recurrence risk, and patient quality of life. **Clinical factors, patient preference, and long-term health considerations** should guide this decision.

1. Anatomical and Surgical Factors

- **Hysterectomy-Based Repair:** Traditionally considered the standard approach in POP surgery, hysterectomy is often recommended when the uterus contributes to prolapse or when additional pathology (e.g., fibroids, adenomyosis, or malignancy) is present. However, it may increase the risk of vaginal vault prolapse and require additional reconstructive procedures.
- **Uterine-Sparing Surgery:** Advances in reconstructive techniques have made uterine preservation a viable option. Procedures such as **sacrohysteropexy** (mesh suspension of the uterus) and **hysteropexy** (native tissue support) aim to restore pelvic floor stability while maintaining the uterus, often leading to **shorter operative times and reduced morbidity**.

2. Patient-Centered Considerations

- **Fertility and Hormonal Aspects:** Uterine preservation is essential for women who desire future pregnancies. Additionally, some studies suggest that **preserving the uterus may help maintain pelvic nerve function**, potentially benefiting sexual function and hormonal balance.
- **Psychological and Quality of Life Factors:** Many patients prefer **uterine preservation for psychological and cultural reasons**, viewing the uterus as integral to their identity. Conversely, some may prefer hysterectomy to eliminate future gynecological concerns.

3. Oncological and Pathological Considerations

- **Indications for Hysterectomy:** If the patient has a history of **endometrial hyperplasia,**

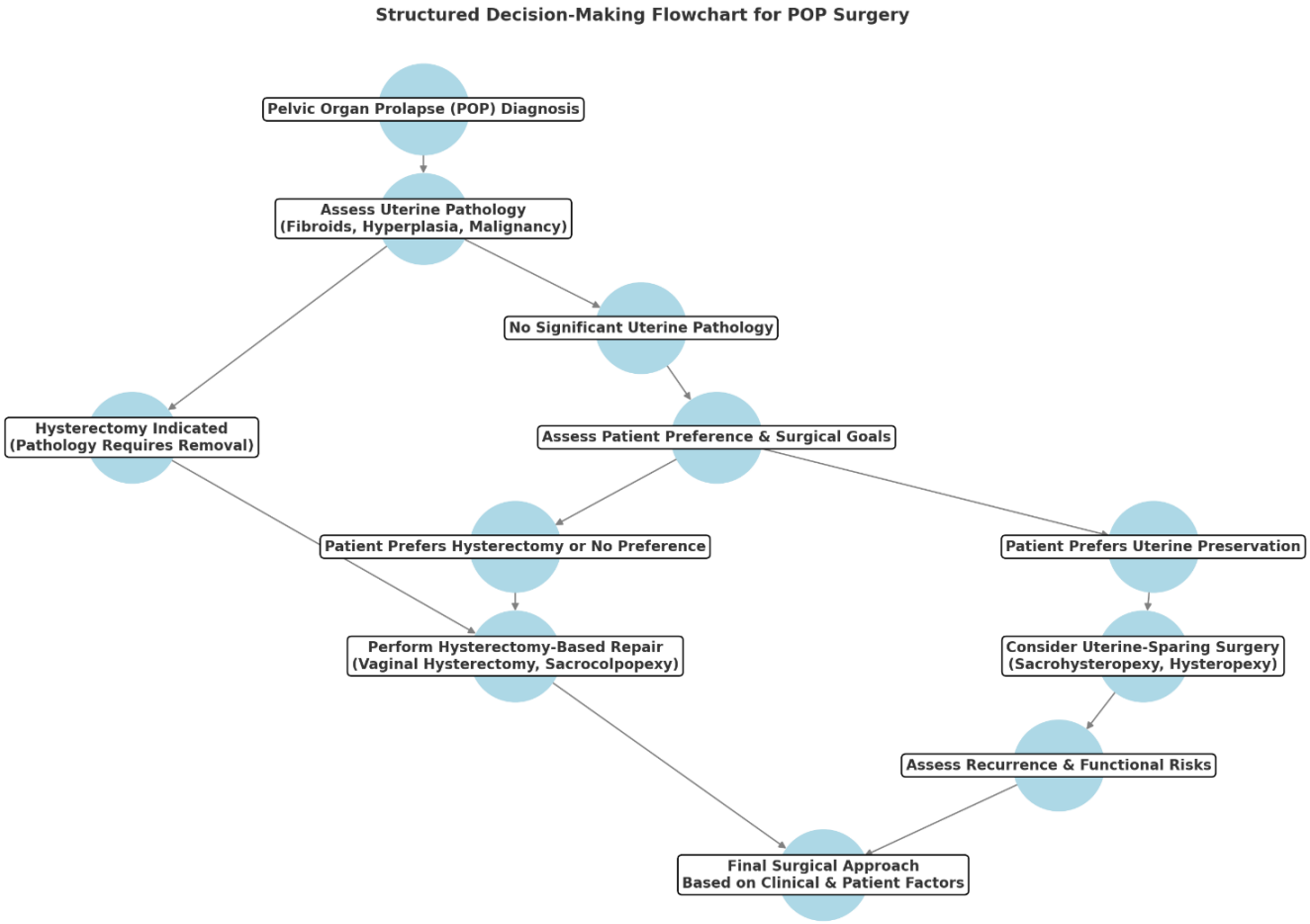
uterine fibroids, or malignancy, hysterectomy is the preferred approach to prevent further complications.

- **Uterine-Sparing Surgery in Low-Risk Patients:** If the uterus is free of pathology, preservation is a safe and feasible option, provided that recurrence risk is managed effectively.

4. Evidence-Based Outcomes

- **Recurrence Rates:** Studies suggest that **hysterectomy-based and uterine-sparing procedures offer comparable success rates**. However, **uterine preservation may slightly increase the risk of recurrence** if adequate pelvic support is not established.
- **Surgical Morbidity and Recovery:** Uterine preservation is associated with **shorter operative times, fewer intraoperative complications, and quicker recovery** compared to hysterectomy.

The decision to remove or retain the uterus in POP surgery should be **individualized based on clinical evaluation, surgical feasibility, and patient preferences**. While **hysterectomy remains the gold standard in cases of uterine pathology**, uterine-sparing techniques provide **a safe, effective alternative for select patients**. A **shared decision-making process** between the patient and healthcare provider is essential to achieving **optimal surgical outcomes and long-term satisfaction**.



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How does obesity contribute to SUI, and what are the treatment strategies?

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Obesity is a significant risk factor for stress urinary incontinence (SUI), a condition characterized by involuntary urine leakage due to increased intra-abdominal pressure. The pathophysiological mechanisms linking obesity to SUI include excessive mechanical stress on the pelvic floor, weakened urethral support, and metabolic changes leading to impaired neuromuscular function. Increased body mass index (BMI) correlates with heightened intra-abdominal pressure, resulting in strain on the bladder and urethral sphincter, which weakens their ability to maintain continence. Additionally, obesity-associated inflammation and hormonal imbalances may further contribute to pelvic floor dysfunction.

Treatment strategies for SUI in obese individuals involve both conservative and interventional approaches. Weight loss through lifestyle modifications, including dietary changes and exercise, has been shown to reduce SUI symptoms by alleviating pressure on pelvic structures. Pelvic floor muscle training (PFMT) and behavioral therapies, such as bladder training, are effective first-line treatments. Pharmacological interventions targeting urethral function and minimally invasive procedures, such as urethral bulking agents, may offer symptom relief. For severe cases, surgical options like mid-urethral sling procedures are considered, though outcomes may be influenced by obesity-related factors. This report explores the interplay between obesity and SUI, emphasizing the importance of weight management and multidisciplinary treatment approaches to improve patient outcomes. Understanding the underlying mechanisms and optimizing treatment strategies is crucial for addressing SUI in obese individuals and enhancing their quality of life

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How does diabetes affect POP, and what are the treatment strategies?

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Diabetes, particularly type 2 diabetes, has become a significant public health concern globally. The prevalence of diabetes has been steadily increasing, with estimates suggesting that over 400 million people worldwide are affected. Diabetes may contribute to POP through 1. Neuropathy: Diabetic neuropathy can affect the nerves that control pelvic floor muscles, leading to weakened support and increased risk of prolapse. 2. Connective Tissue Changes: Diabetes can alter collagen metabolism, potentially weakening the connective tissues that support pelvic organs. 3. Obesity: Many individuals with diabetes are also obese, which increases intra-abdominal pressure and can exacerbate the risk of prolapse.

For patients with both diabetes and pelvic organ prolapse, treatment strategies may differ from those for the general population due to the need to manage both conditions effectively. Key considerations include: 1. Lifestyle Modifications: Emphasis on weight management, dietary changes, and regular physical activity is crucial. These modifications can help control blood sugar levels and reduce the risk of further prolapse. 2. Surgical Options: If surgical intervention is necessary for prolapse, careful consideration of the type of surgery is important. Surgeons may prefer minimally invasive techniques to reduce recovery time and complications, especially in diabetic patients. 3. Increased Risk of Complications: Diabetic patients may have a higher risk of surgical complications, necessitating a more cautious approach to surgical interventions. 4. Focus on Glycemic Control: Greater emphasis on maintaining stable blood glucose levels before and after any surgical procedure to promote healing and reduce complications. In summary, the interplay between diabetes and pelvic organ prolapse necessitates a tailored approach to treatment that addresses both conditions holistically.