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EVIDENCE, ATTITUDE & PRACTICE**

*Dedicated Issue:
Urogynaecology*



AOGD SECRETARIAT

Institute of Obstetrics & Gynaecology,

Sir Ganga Ram Hospital

Sarhadi Gandhi Marg, Old Rajinder Nagar, New Delhi-110060

Tel.: 011-42251768, 1789

E-mail: secretaryaogdsgrh2020@gmail.com

Website: www.aogd.org

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Editors

Dr Geeta Mediratta, Dr Chandra Mansukhani
Ph. No. 011-42251768, 1789; Email: secretaryaogdsgrh2020@gmail.com

AOGD Secretariat

Institute of Obstetrics and Gynecology, Sir Ganga Ram Hospital
Sarhadi Gandhi Marg, Old Rajinder Nagar, New Delhi-110060
Tel.: 011-42251768, 1789
E-mail: secretaryaogdsgrh2020@gmail.com | www.aogd.org

From the President's Pen



Greetings from AOGD Secretariat !!

The New Year 2021 has brought newer hope and new vigour to the entire mankind. The vaccination drive organised by the government is a welcome move. Most of the health care facilities whether public or private are providing the benefits of vaccination to doctor, nurses, and other health care workers. This speaks of an excellent drive against this pandemic. We will definitely overcome the corona crisis together. We should continue with our persistent social distancing, hand sanitization and should continue to use mask as a routine.

Our virtual academic meets had been a great success. Throughout the year we indulged in comprehensive and focused academic activities and we connected to each other virtually. As corona crisis lessons, we also look forward for the meeting each other personally, That is why we are planning a small physical meeting of the executive members on the 18th Feb 2021 at Sir Ganga Ram Hospital. We are happy that the physical meet proposed at Sir Ganga Ram Hospital will act as a catalyst in taking crucial decision together.

We are looking forward for wonderful days ahead both, academically and socially.

Long Live AOGD!

Dr Mala Srivastava

President, AOGD

From the Vice President's Pen



Greetings to all members of the association!

Hope you and your families are safe and doing well !

As the spring season of 2021 is approaching, and the vaccination spree has started, we are hopeful that soon there would be restoration of life towards normalcy.

We at AOGD tried our best to ensure that we fulfil our objectives to provide a platform for increasing knowledge, skills and awareness to our members in advances in the field of Obstetrics & Gynaecology using alternate channels like virtual meetings and webinars on thought provoking topics with experts from all over the country and sometimes International too.

Now, going forwards, let's hope that we can meet each other physically and have interactive CMEs, Conferences and live Workshops soon.

Our Chief Editor, Dr Geeta along with the Editorial team, has woven this month's write-ups in the bulletin on her sub-speciality; **Urogynaecology** with great efforts. I'm sure it'll be of immense use and interest for all our readers.

As has been said – **“Don't limit your challenges, Challenge your limits”**

Wishing a very 'Happy Basant Panchmi', and 'Valentine's day' to everyone !

Regards,

Dr Kanika Jain

Vice President, AOGD

From the Secretary's Desk



Greetings to all !

Hope you all are keeping safe and healthy. As the time passes, Let's be optimistic that year 2021 becomes CORONA free.

The academic activities in the month of January-February 2021 continued to be on the virtual platform as webinars and e-CMEs. Virtual Gurukul teaching program has been successfully organized by AOGD & ISOPARB.

Our editorial team has brought the AOGD E-bulletin February version dedicated to **Urogynaecology**, which should be of great interest and immense use to our readers.

Looking forward to your continued support.

Things work out best for those who make the best of how things work out. – John Wooden

Warm Regards

Dr Mamta Dagar

Hon. Secretary

Monthly Clinical Meeting

AOGD Monthly Virtual Clinical Meet will be organised by University College of Medical Sciences and Guru Teg Bahadur Hospital, New Delhi on 26th February, 2021 from 04:00pm to 05:00pm.

AOGD Executive Committee Meeting will be held on 18th February, 2021 between 04:00 pm to 05:00 pm at Sir Ganga Ram Hospital, Auditorium

From the Editor's Desk



Dr Geeta Mediratta
Chief Editor

Dear Friends,

Welcome to another edition of the AOGD Bulletin for the month of February 2021.

This month's issue is dedicated to discussing Urogynecology and its various aspects.

The first article has been brilliantly penned by Dr. Amita Jain on "**Fundamentals of Urodynamics**" followed by Dr. Monika Gupta's detailed description of the "**Overactive Bladder**". "**Recurrent UTI**" are a very common problem faced by all of us in our practice & Dr. Karisma Thariani has lucidly detailed "**The management of this common problem of women**" it in her article.

Dr. Aparna Hegde has described the role of "**PFMT & Biofeedback in Pelvic floor Dysfunction**" in her inimitable way and is very informative for all us especially PG students.

"**Role of Burch colposuspension in the current scenario**" by Dr. J.B. Sharma is a brilliant exposition of the surgical technique. "**Complete Perineal Tear management guidelines**" need to be really understood by all the practising Obstetricians & has been clearly described by Dr. Rajesh Kumari.

Hope this edition proves to be a useful addition to the knowledge bank of all of us.

Happy reading!

Editorial Team



Dr Chandra Mansukhani
Co-Editor

Fundamentals of Urodynamics

Amita Jain

Senior Consultant, Urogynaecology, Medanta Institute of Urology & Robotic Surgery, Gurugram

Introduction

Urodynamics is the umbrella term that covers investigations of lower urinary tract function. The term encompasses the following investigations: uroflowmetry, cystometry (standard and video), urethral pressure profilometry and ambulatory urodynamics.

Standard cystometry is the commonest investigation for storage and voiding symptoms. It has two parts: filling and voiding. Both are normally performed as part of every investigation with some exceptions, for example in patients unable to void, when filling cystometry alone would be carried out.

It aims to reproduce a patient's symptoms and by means of pressure measurements, provide a pathophysiological explanation for them. Detrusor pressure is measured indirectly from vesical and abdominal pressures using the formula: $p_{ves} - p_{abd} = p_{det}$. Abdominal pressure (P_{abd}) is measured to allow for the effect of increases in abdominal pressure, for example straining, on vesical pressure.

During cystometry there is a constant dialogue between the investigator and the patient so that any symptoms experienced during the test can be related to urodynamic findings. A full report is produced following a urodynamic investigation, which will normally include history, examination, urodynamic findings and suggestions concerning management. The report should state whether the patient's symptoms were reproduced and whether voiding was felt to be representative.¹

ICS Standard Urodynamics Protocol

Cystometry²: Continuous liquid filling of the bladder via a transurethral (or other route eg, suprapubic) catheter, at least with P_{ves} and P_{abd} measurement and display of detrusor pressure, including quality checks and provocations to aid eliciting symptoms. Cystometry ends with "permission to void" or with severe incontinence. The fluid type and temperature, filling method and rate, catheter sizes, pressure recording technique, and patient position should all be specified.

Pressure-Flow study²: P_{ves} and P_{abd} are measured, from "permission to void," while uroflowmetry is performed with a transurethral (or supra- pubic) catheter in place. The position of the patient, the catheter sizes and the pressure and flow recording technique should be specified.

Setting Up Equipment

Before urodynamic studies are undertaken it is important to understand how the equipment functions, which disposables are required and how to check calibration. There are a number of different urodynamic machines in use and it is important for the Urodynamicist to develop a good working relationship with the supplier.

Cystometry is performed using pressure transducers which are sited either externally or internally. External transducers are currently more common and require a fluid filled system of catheters and tubing that can transmit pressure from the patient to the transducer. Water is normally used as the fluid, although air-filled systems are also available. Alternatively, transducers are mounted on the catheters themselves, using catheter tip transducers. Systems using liquid-filled catheters and external transducers are recommended by the ICS^{2,3}. Using ICS standard pressures based on liquid-filled systems allows comparison of data between patients and centres. New technologies need to prove their usefulness and accuracy compared to existing ICS standard urodynamic tests before clinical application. Micro-tip or air-filled catheters are not interchangeable with liquid-filled systems². To date, there are no standardized pressure measurements for air-charged catheters.

Apart from urodynamic machine and external water-filled non - disposable transducers; the following disposables are also required to conduct a study:

Syringes, Three way taps, Domes, Manometer tubing/catheter to patient, Sterile water or physiological saline

Following Are The Steps For Setting The Equipment Ready Before Starting The Test

- Use the thinnest possible transurethral double or triple lumen catheter or a suprapubic catheter. Two-catheter techniques (separate filling and pressure recording catheters) are an acceptable alternative².
- **Fix the catheter** as close as possible to anus and urethral meatus with tape, without blocking the urinary meatus.
- Rectal placement of a fully liquid filled open catheter, or punctured balloon catheter, to measure P_{abd} is ICS standard. Vaginal or stoma placement is used only if rectal placement is impossible⁴.
- **Prime System:** Flush sterile water through the length of the system, with both three way taps open before the domes are attached to the external transducers. It is done to remove air bubbles, and thus create a continuous column of water between patient and transducer.
- **Zero to Atmosphere:** This is done by positioning the taps so that the transducer is open to the atmosphere and closed to the patient. The “zero” or “balance” option on the urodynamic equipment is then selected. Any subsequent pressures will now be read relative to atmospheric pressure.
The use of two three-way taps either side of the dome makes it easier for troubleshooting (checking zero and flushing) before and during the test, without introducing unnecessary air into the system.
- **Set reference height:** The pressure transducers need to be placed at the upper edge of the symphysis pubis to avoid artefactual pressure measurements due to the hydrostatic pressure effect. If the patient changes position during the test, the height of the transducers should be changed to the new level of the symphysis pubis.
- **For recording:** The tap to the syringe remains off. The other tap is open to the transducer and the patient, but off to atmosphere. A cough test can now be performed. If the height of one cough peak is less than 70% of the other, the line with the lower value should be flushed with water and the cough test repeated⁴.

Checking Calibration

A simple check of calibration for **external pressure**

transducers (before connection to the patient) is to simply move the end of the filled pressure line through a known vertical distance (e.g. 50 cm) above the transducer dome and the pressure reading on the urodynamic equipment should change by the same amount (≥ 50 cmH₂O is recommended). The calibration should be verified regularly (eg, every 10 urodynamic measurements for non-disposable transducers) and documented.

Flowmeter calibration can be achieved by pouring a precise volume at a constant flow into the flowmeter and checking the recorded volume. Calibration should be verified regularly (eg, every 10 urodynamic measurements). If frequent recalibration is necessary, the flow transducer might need to be replaced.

Infusion pumps are tested by measuring the time to deliver a known volume. The filling catheter should be connected, as peristaltic type pumps (where a series of rollers compress a flexible tube) may show errors due to downstream resistance. Load cell measurement of infused volume is advised, as peristaltic pumps may turn even when the downstream tube is blocked⁴.

Running A Test

Before Test

Identify the urodynamic question, i.e. what symptoms are we trying to reproduce? Use this information to individualize the test for a patient. Instructions must be given to the patient regarding continuation of usual lut management (eg, medication). A urinalysis to screen for infection or haematuria should be evaluated. Patient should also maintain a frequency volume chart or bladder diary before test. 6, 12 bladder should be emptied at start of test.

At The Start of The Test

Pressure Readings

According to the International Continence Society (ICS) standardisation report on ‘Good urodynamic practices’¹, vesical and abdominal pressure measurements should be within the range of 5-20 cmH₂O if measured with the patient supine, 15-40 cmH₂O, if measured sitting and 30-50 cmH₂O if recorded standing.

Filling Rate

Consider a filling rate in mL/min of roughly 10% of the largest voided volume (reported on a FVC; and allowing for PVR)². Maximum physiological filling rate is estimated in kg divided by four. More rapid filling is referred to as nonphysiological filling rate³. Diuresis adds bladder volume that is not recorded by the urodynamics system, but that is relevant for interpretation of the results.

Troubleshooting

If pressures are outside the acceptable range:

- If vesical and abdominal pressures are similar, but outside the acceptable range:
 - o check the height of the transducers. The ICS reference height is the upper edge of the symphysis pubis.
 - o If the reference level is not correct, adjust accordingly.
- If only one pressure is outside the acceptable range:
 - o Flush catheter
 - o Check that zero has been set correctly on the relevant transducer
 - o Consider resiting catheter

During The Test

Filling Phase

Sensations

Three sensation parameters are recorded⁶:

1. FSF: “Tell me the moment when you perceive that your bladder is not empty anymore.”²
2. FDV: “Tell me when you have the sensation that normally tells you to go to the toilet, without any hurry, at the next convenient moment.”¹
3. SDV: “The moment that you would definitely visit the nearest toilet to pass urine.” There should be no pain or any fear of losing urine.

The patient also may report sensation(s) suggesting “urgency,” which can be marked specifically. The end of filling should relate to a “strong but not uncomfortable need to void,” indicated by SDV on the urodynamic graph. Incontinence, fear of leakage, pain, or other signs or symptoms during the test should be specifically marked on the urodynamic graph.

Provocation

Leak point pressure (LPP)² is the pressure (spontaneous or provoked) that has caused fluid to be expelled from the bladder at the moment that it is visible outside the urethra. No ICS (or commonly agreed) standard technique or protocol is available and a variety of terms and techniques are used.

Detrusor Overactivity (DO) is characterised by involuntary detrusor contractions during the filling phase which may be spontaneous or provoked.

Cough-associated DO is reported when the onset of the DO (with or without leakage) occurs immediately following the cough pressure peak. Cough-associated DO incontinence is a form of DO and must not be confused with USI.

Voiding Phase (Pressure Flow Study)

It begins immediately after permission to void and ends when the detrusor pressure has returned to the baseline value and/or the flowrate to zero and/or the patient considers the micturition completed. Use the shortest possible meatus-to-flowmeter distance, raising the flowmeter to suit the individual patient, otherwise correction for delay between pressure and flow recording may be needed. Cough checking of catheter response is always required after pressure-flow.

Troubleshooting

Fall in pressure of vesical or abdominal line during filling: Neither the vesical or abdominal pressures should decline during filling and, if the pressures are noted to drop, then attempts should be made to correct this:

- Flush line – this may be enough to restore pressure
- If pressures continue to fall, check for leaks in a systematic manner
 - o Check taps and all connections have been adequately tightened
 - o Check lines—occasionally there may be a manufacturing fault

Unequal Transmission of Pressure Between Vesical and Abdominal Lines

- Flush lines
- Check whether there is any air in the dome over the external transducer

Few examples of Urodynamic tracings and their interpretation are given below.

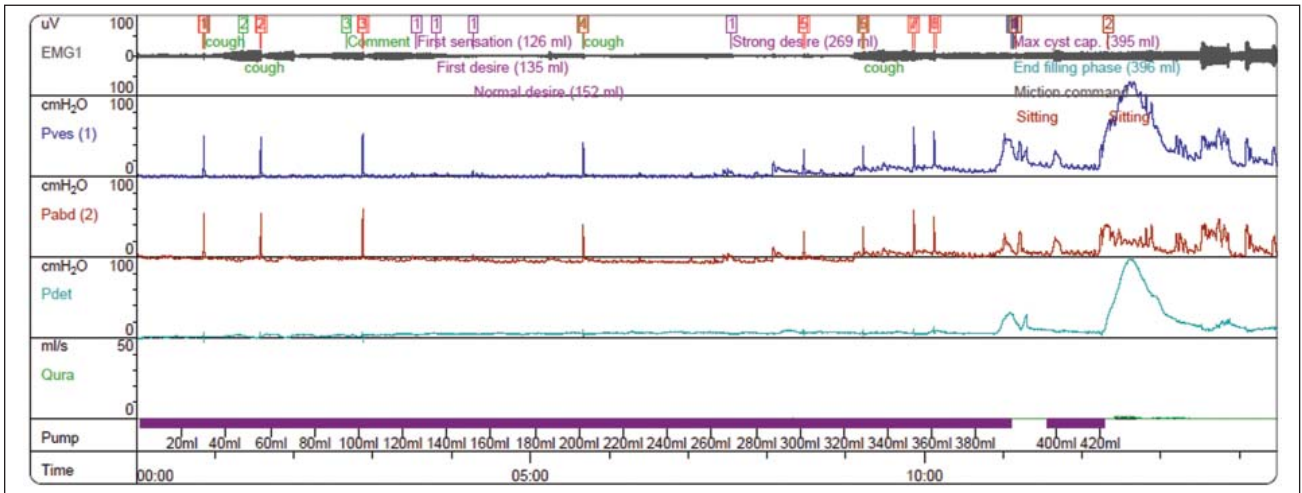


Figure 1: Voiding Cystometry – showing terminal detrusor instability. Diagnosis: Over active bladder

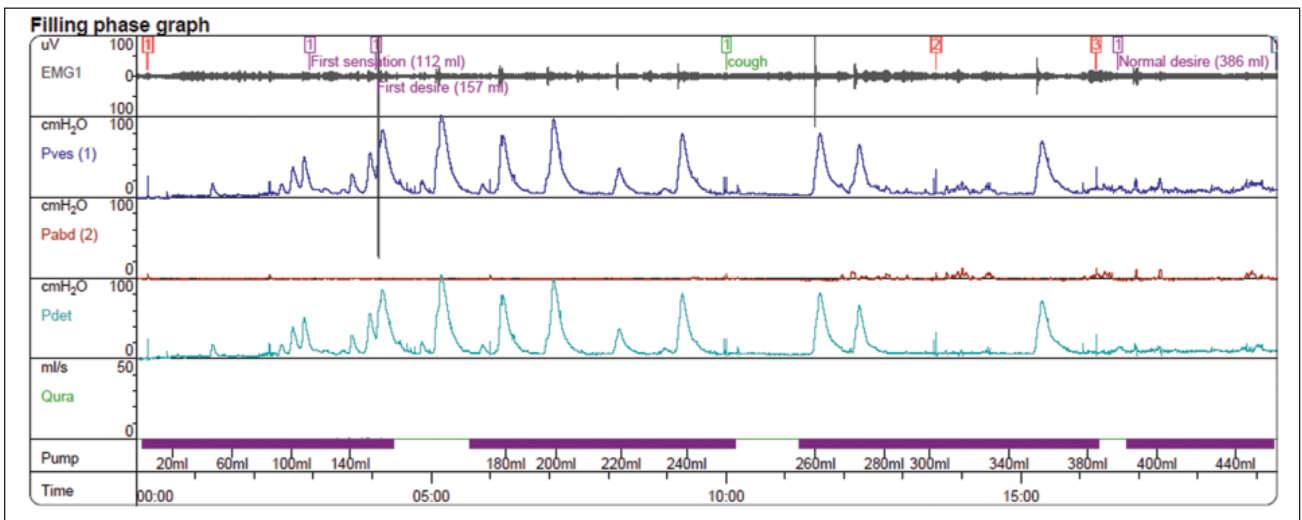


Figure 2: Voiding Cystometry – showing phasic detrusor instability with leakage. Diagnosis: Urge urinary incontinence

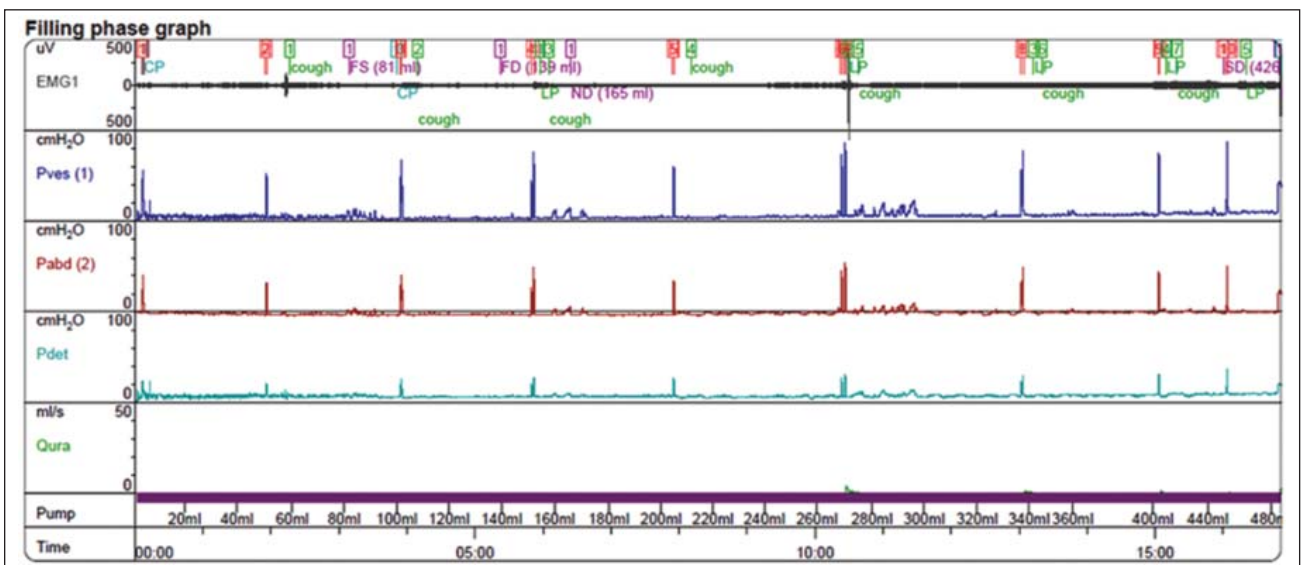


Figure 3: Voiding Cystometry – showing stress leak with cough. Diagnosis: Stress urinary incontinence

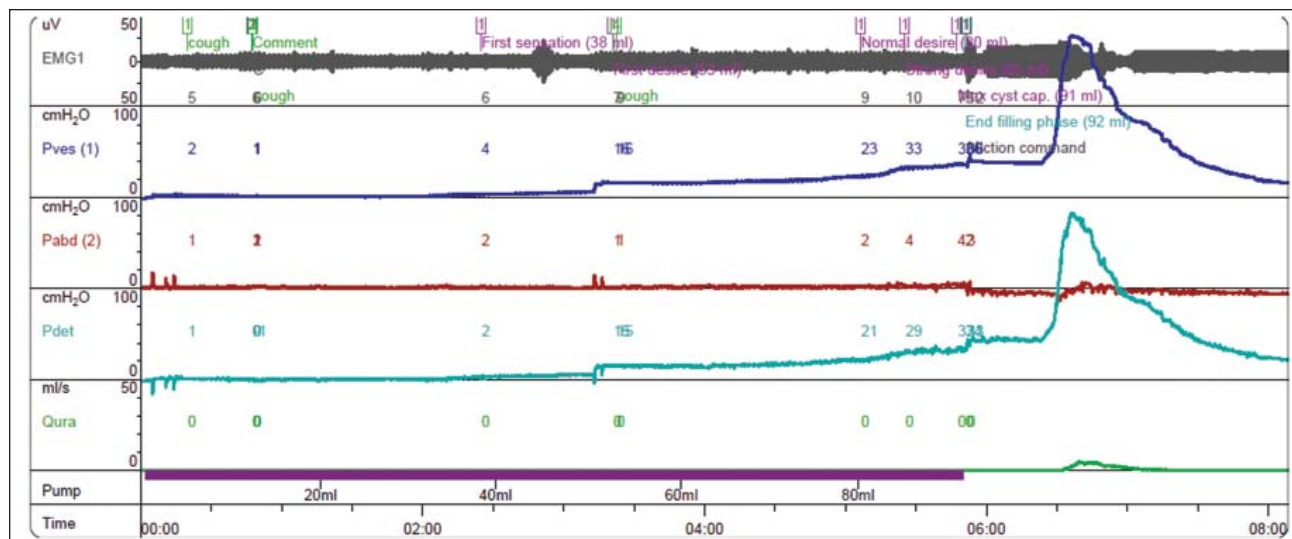


Figure 4: Voiding Cystometry – showing small capacity bladder with poor flow rates despite high opening detrusor pressures. Diagnosis: Bladder outlet obstruction

- Check taps are in the correct position
- Consider resiting catheter

If lines stop recording and the pressures drop dramatically: This is probably because one of the catheters has fallen out or become compressed

- Reposition or resite catheter
- If vesical catheter has fallen out before Qmax, consider refilling and repeating the pressure/flow

Interpreting Urodynamic Traces

All interpretation should be undertaken within the context of the patients’ presenting urinary symptoms. Understanding ‘normal’, or, in simple terms, what a normal urodynamic trace should look like during a urodynamic investigation, can provide a strong foundation for developing skills in interpretation.

The initial void (prior to catheterisation) is a very important baseline measurement as it provides flow rate, flow pattern, voided volume, residual urine measurements, and the voiding time. It is important to ask the patient whether their void is normal for them, and whether they feel their bladder has emptied completely. This helps to establish a baseline for comparing values from their voiding cystometry¹.

Features, Artefacts and Errors

Patient movement, external manipulation of the catheter and other influences cause signal patterns that should be recognized during the test and at evaluation of graphs.

Position change²: A change in patient position, either active or passive (eg, tilting), is visible on the cystometry trace by a lasting change of equal magnitude in both pves and pabd. A position change should be followed by adjustment of the external pressure sensors height to the new level of the pubic symphysis, so that the physiological pves and pabd are observed again; pdet should be unaffected.

Rectal contractions: temporary phasic increases visible in the pabd trace, without synchronous change in pves, resulting in negative deflections of pdet.

Dropped pabd at void: during the voiding time, pabd decreases below the previous resting pressure (as a consequence of pelvic [and abdominal] muscle relaxation). This will artefactually increase pdet, and so affect the pressure-flow analysis result.

Straining: observable as a temporary increase in both pves and pabd pressure.

Knocking the flowmeter: may produce ‘spikes’ on the trace which need to be ignored.

Wag factor: Moving the urinary stream relative to the flowmeter will produce artefactual fluctuations in the flow trace –

Lag factor: If making simultaneous measurements of pressure and flow, it may be necessary to correct for the time delay between the stream exiting the urethral meatus and it being recorded by the flow meter

After-contraction: a continued or new detrusor pressure rise immediately after flow ends. It is important to note if this occurs with the complete emptying of the bladder. This may be the reason why some patients feel they have an urgency sensation at the end of voiding.

Writing The Report

Reporting includes the following elements:

- Overall judgement of the technical quality, clinical reliability, representativeness, and methods of assessment.
- Uroflowmetry: voiding position, Qmax, voided volume, PVR.
- Introduction of catheters: sensation, muscular defence, obstruction(s).
- Patient position(s) during cystometry and PFS.
- Patient's ability to report filling sensations and/or urgency and/or urine loss.
- Method of urodynamic stress test and accessory tests (if applicable).
- Diagnoses: filling sensation (with volumes); cystometry; PFS (bladder outflow function, detrusor contraction).

All results and observations should be carefully reported. It is good clinical practice to integrate the urodynamic test results with the history, examinations, and other tests.

Conclusions

A good study is one that is easy to read and one from which any experienced urodynamicist will abstract the same results and come to the same conclusions. Adherence to the fundamentals of the standards is essential prerequisite.

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Overactive Bladder

Monika Gupta¹, Sukanya Roy²

¹Professor, ²Ex-Postgraduate Resident, Department of Obstetrics and Gynaecology, VMMC & Safdarjung Hospital, New Delhi

The term Overactive bladder (OAB) as defined by the international continence society (ICS) is “urinary urgency, usually accompanied by frequency and nocturia, with or without urgency incontinence, in the absence of urinary tract infection or other obvious pathology”.^{1,2,3} Basically, it is a clinical diagnosis and the absence of urgency rules out the diagnosis. OAB has got two types, it is termed as “OAB wet” when accompanied by urge incontinence, whereas without incontinence it is called “OAB dry”.⁴

There are various bladder related conditions interfering with the diagnosis of OAB being only slightly different from each other. One such disorder is detrusor overactivity which is more of an urodynamic observation as it is defined as the occurrence of involuntary contractions during filling cystometry on a urodynamic study.⁴ Another condition which needs to be appreciated is urge incontinence which is involuntary leakage of urine preceded by a strong desire to pass urine.

Prevalence

OAB is an age dependent disorder which is reflected in its overall prevalence of 12-17% in adults which further increases with age being as high as 19% in age group of 65-74 years.⁴ “OAB wet” is more prevalent in women and “OAB dry” is more prevalent in men. Pregnancy causes relative weakness of the bladder neck and urethral sphincter mechanism which predisposes women to higher risk of OAB wet. OAB affects quality of life with nocturia causing sleep disturbances and thus reducing work efficacy apart from negative impact on sexual life.

Pathophysiology and Etiology

The mechanism of bladder continence involves a strong interplay between the parasympathetic and sympathetic systems. The sympathetic innervation to the bladder arising from the thoraco-lumbar region of the spinal cord (T1-L2) is via the hypogastric nerve and it relaxes the detrusor muscle of the bladder via the beta-adrenergic receptors during the filling phase of the bladder.^{4,5,6}

The parasympathetic system (S2,3,4) comes into play during micturition phase when the pelvic nerve acts via the muscarinic receptors and causes detrusor contractions to evacuate the bladder. There are 5 subtypes of muscarinic receptors in the bladder out of which M2 (80%) and M3 (20%) receptors are the pre-dominant ones.^{4,5,6}

The understanding of these complex neurocircuits have a role in developing pharmacotherapy for the treatment of OAB.^{7,8} And, due to same reason, OAB is found to be associated with various neurological disorders like Multiple sclerosis, Parkinson’s disease and cerebrovascular disorders.^{8,9}

The most common aetiology of OAB is idiopathic which can be explained by two hypotheses, i.e., neurogenic and myogenic hypothesis. The neurogenic hypothesis explains that detrusor overactivity arises from generalized nerve mediated excitation of the detrusor muscle, while the myogenic hypothesis states that overactive detrusor contractility results from a combination of an increased spontaneous excitation potentials within detrusor muscle and enhanced propagation of contractile signals via cell to cell coupling.^{9,10}

Various risk factors for OAB are aging, neoplasia, spinal cord injury, bladder outlet obstruction and pelvic and anti-incontinence surgery, advanced pelvic organ prolapse, psycho-somatic diseases, urine in proximal urethra, detrusor overactivity with impaired contractility, diabetes mellitus and vaginal delivery.

OAB Management

Diagnosis of OAB is based on a careful history, physical examination and urine analysis.¹¹ The supportive investigations include post void residual urine volume and 3 day bladder diary being the most relevant ones followed by cystoscopy and urodynamic studies in case of complications. One should evaluate the impact of OAB symptoms on quality of life treatment must be aimed at improving the same.

1. Detailed history taking should include

- Number of episodes of leaking in a day/ on the way to washroom
- Usage of pads in the underwear to avoid soakage of clothes
- Detailed gynaecological and past obstetric histories
- Medical conditions like diabetes mellitus, closed angle glaucoma & neurological conditions
- Past surgeries and radiotherapy
- Intake of bladder irritants like tea, coffee, alcoholic drinks, acidic foods and drinks
- Excessive intake of water/fluids
- Additional information as regards POP (Pelvic organ prolapse), defecatory dysfunction and sexual dysfunction
- Drug history of medications like intake of diuretics and alpha agonist

2. Questionnaires⁴

These are various validated tools for the assessment of severity of urinary incontinence and evaluation of quality of life. Health related quality of life (HRQOL), (UDI-6) Urogenital Distress Inventory and the Incontinence impact questionnaire (IIQ-7) encompasses the urinary domain component of the pelvic floor distress inventory (PFDI-20) and the pelvic floor impact questionnaire (PFIQ-7).

3. Bladder diary⁴

It is a 3 day assessment tool for the quantification and keeping record of OAB symptoms. NICE has also recommended this for the initial assessment of women with suspected bladder symptoms. It includes details about:

- Number and types of episodes of urinary incontinence
- frequency of voiding
- Exact voided volumes (recorded by a 'hat' placed in the toilet)
- Quantity of fluid intake and urine output

4. Physical examination⁸

A thorough general, physical, neurological & pelvic examination should be done and make note of:

- BMI (as obesity contributes to incontinence)

- Extremities (Evaluate for edema, which can increase nocturia, especially in elderly patients)
- Neurologic (In cases of associated neurological symptoms, test anal wink reflex, bulbocavernosus reflex, and perineal sensation)
- Abdominal (Palpate for masses or enlarged bladder to rule out any bladder outflow tract obstruction)
- Pelvic (Rule out Pelvic organ prolapse, or weakened pelvic floor, cystocele, vaginal atrophy suggesting hypoestrogenemia)

5. Laboratory evaluation⁷

- *Urinalysis* – to rule out urinary tract infection, haematuria, dehydration or excessive fluid intake (specific gravity normally-1.010-1.025)
- Measurement of *Post Void Residual urine (PVR)*
- *Urodynamics (UDS)*⁵- according to AUA (American Urological Association)/ SUFU (Female Pelvic Medicine and Urogenital Reconstruction), urodynamics is not mandatory for those females who have a clear-cut clinical diagnosis of OAB and those without any associated neurological diseases. The management of such women is started irrespective of UDS findings.

NICE guidelines advocate the use of filling and voiding cystometry in women with suspected detrusor overactivity, voiding dysfunction, anterior prolapse and in those who have had SUI surgeries. In case of diagnostic dilemma, video urodynamics can be considered, as it provides more important anatomical information about the appearance of the bladder and bladder neck (often open in women with SUI).

The characteristic finding of OAB on UDS is presence of uninhibited detrusor contractions or detrusor overactivity (DO).

Differential Diagnoses for OAB has to be carefully ruled out viz. urinary tract infection, stress urinary incontinence, atrophic vaginitis, pelvic organ prolapse, post-surgical incontinence, neurogenic bladder, bladder diseases like bladder stone/ malignancy, diabetes mellitus, recent pelvic surgeries, female urethral stricture.

6. Treatment

The treatment plan can be divided into first line- conservative, second line- pharmacotherapy and third line being surgical therapy.

A. Conservative management⁵

- **Lifestyle and behavioural modifications** which are under patient's self- control along with minimal side effects. A minimum period of 3 months has to be observed for the effects to be manifested and once achieved, the effects are even longer lasting than pharmacotherapy itself.
- Weight reduction- even 5% reduction in weight decreases incontinence episodes by 50%.
- Avoidance of certain food/drinks which are bladder irritants irritate like caffeinated products, alcohol, acidic and spicy products.
- Cessation of Smoking
- Fluid restriction in patients taking excessive amount of fluids to 6-8 ounce glasses of fluid each day.
- Management of constipation
- Watch over drug intake affecting the bladder function and the continence mechanism like Anticholinergics, Antihistaminics, Beta-blockers, Calcium channel blockers, NSAIDS, Diuretics, Alpha-Blockers, Oral estrogen/ Transdermal estrogen, Antipsycotics
- Electrical stimulation of Posterior Tibial Nerve
- **Pelvic Floor Muscle Training (Kegel Exercises)**

These are the first line conservative therapy for all types of Incontinence. Based on the principle of strength training, they involve periodic contractions of the pelvic floor muscles by squeezing and releasing them. These contractions voluntarily suppress the detrusor contractions by tightening the pelvic floor.

The basic regimen is set of 10 contractions 3 times per day. Improvement can be noticed after 6-12 weeks of exercise. The best way of doing Kegels exercises is during lying down but it can be performed anywhere even during sitting and watching television or talking on telephone. The correct technique

can be taught to the patients by manual feedback (palpating the pelvic muscles during the exercise) and biofeedback (using a vaginal or anal device that provides visual or audio feedback about the pelvic muscle contraction).

- **Bladder Training**

It is another appropriate first line treatment for urgency urinary incontinence. It aims at prolonging the interval between each voiding episode gradually by 2-4 hrs. The woman should be motivated to hold urine for longer periods to keep the schedule., i.e. 15-30 minutes every 1-2 weeks.

- **Combined Kegel exercises and Bladder Training** - is more effective than either modality alone.

- **Electrical and Magnetic stimulation of Pelvic floor muscles -**

a vaginal or anal electrode can be used in those women who fail to contract their pelvic floor muscles voluntarily. It can be done in two 15 minutes sessions daily for 12 weeks.

B. Pharmacological Therapy⁸

It forms the second line treatment of OAB, to be added in case of no response to conservative management. But the use of drug therapy gets limited by the side effects of these drugs. There are two groups of medications that are in practice- anticholinergics and beta- adrenergic agonists. Anticholinergics have higher rates of side effects and discontinuation rates. Mirabegron – a beta-3 adrenergic agonist is the newest class of drugs to be approved by FDA in 2012 with lesser side effects.

Anticholinergic/ Antimuscarinic Drugs

There are 5 subtypes of muscarinic receptors in the bladder of which M2 and M3 are the predominant ones. These drugs inhibit the acetylcholine mediated involuntary detrusor contractions both in the filling/ storage phases, reduces the sensory input and increases the bladder capacity and thus, incontinence (Table 1). Antimuscarinic drugs are broadly classified into - Tertiary Amines and Quaternary Amines.

Tertiary Amines – are more lipophilic than Quaternary Amines and hence can pass across blood brain barrier more readily. (e.g. Oxybutinin, Tolterodine, Solifenacin, Darifenacin). They are metabolized via cytochrome P450 enzyme system. So, risk of drug interaction is there in patients receiving other drugs which have same route of metabolism.

Quaternary Amines – cross the blood brain barrier minimally as they are less lipophilic and majority is excreted unchanged from the kidney. (e.g. Trospium chloride)

Darifenacin is the most selective M3 receptor antagonist. It has a higher degree of M3/M2 selectivity.

Antimuscarinics have been shown to be more effective than placebo in terms of mean change in the number of urgency episodes/day, number of Incontinence episodes / day, number of micturitions/day and volume voided per micturition (13-40 ml). Efficacy of all anti-muscarinics are almost similar. Patients with more severe symptoms have on an average, greater symptom reduction experience. Extended release preparations should be used as much as possible. With typical efficacy of 40-60%, rates of achieving continence range between 5- 59%.

Duration of treatment is at least 3 months to see the complete response although improvement in symptoms could be seen after first week only. 50% of the patients discontinue taking medications by the end of

3 months because of the anticholinergic side effects like; dry mouth, pruritis, constipation, urinary retention, cognitive effects, visual impairment, increase in heart rate, etc.

If there is inadequate symptom control on using one class of antimuscarinics, then a dose modification or a different anti-muscarinic or a beta-3 adrenergic receptor agonist may be tried.

Beta-3 Adrenergic Agonist – Mirabagron

Beta 1, 2 and 3 adrenergic receptors are present in the human bladder urothelium and detrusor muscle, of which beta -3 is the predominant. These drugs help in bladder relaxation by activation of adenyl cyclase. Mirabegron was approved by FDA in 2012 for the indication of OAB.

The usual prescribed dose is 25- 50 mg/day. The efficacy rate is similar to Antimuscarinics with a lower rate of dry mouth. It can be considered as an important replacement for antimuscarinics with better tolerability and lesser side effects profile. The only contraindication of this drug is uncontrolled hypertension of 180/110 mm Hg

A refractory patient is someone who failed a trial of symptom appropriate behavioural therapy of sufficient length (8-12 weeks) and who has failed a trial of at least one anti muscarinic medication administered for 4-8 weeks. Failure of an anti-muscarinic medication may include either lack of efficacy and/or inability to tolerate adverse drug effects.

Table 1: Various available Antimuscarinic drugs

	Oxybutynin	Tolterodine	Solifenacin	Darifenacin	Trospium Chloride
Chemical structure	Tertiary amine	Tertiary amine	Tertiary amine	Tertiary amine	Quaternary amine
Receptor Selectivity	Non selective	Non selective	M3 selective	M3 selective	Non selective
Route	Oral Transdermal (Patch or gel)	Oral	Oral	Oral	Oral bioavailability only 10%
Dosing	5 mg 3 times day	1-2 mg twice day	5-10 mg/day	7.5-15 mg/day	20-60 mg/day
Half Life	2 hours patch 8 hrs ER 12 hrs	2 hours ER 9 hrs	45-86 hours	13-19 hours	12-20 hours
Metabolism	Hepatic	Hepatic	Hepatic	Hepatic	60% Excreted unchanged in urine
Side Effects	Transdermal has less side effect	<ul style="list-style-type: none"> • Dry mouth • Constipation • Blurred vision 	<ul style="list-style-type: none"> • Dry mouth • Constipation 	<ul style="list-style-type: none"> • Dry mouth • Constipation 	Lower risk of CNS side effect
FDA Approval	Yes	Yes	Yes	Yes	Yes

C. Botulinum Toxin in OAB

It is the third line of management of OAB. The basic mechanism is the inhibition of Acetylcholine release from the presynaptic nerve terminal and thus suppression of detrusor contractions. Also, it alters urothelial sensory afferent pathway and prevents hypersensitivity responses. There are two types of botulinum toxins:

Onabotulinumtoxin Type A (BOTOX, Allergan, Inc; Irvine, CA, USA)

Abobotulinumtoxin Type A (Dysport, Ipsen, Biopharm)

Onabotulinum toxin type A is a more acceptable option for OAB as Abobotulinum causes more of urinary retention requiring self-catheterization. 100 U of Onabotulinum toxin type A is injected at average of 15-20 sites in bladder cystoscopically avoiding trigone; 5 U each separated by 1cm each. Mean duration of symptom relief is 6.3-10.6 months. There is significant reduction in urgency, frequency and urge incontinence. Complications like urinary retention, urinary tract infections and intermittent self-catheterization could be seen with botulinum use, especially with higher doses.

D. Surgical Neuromodulation¹⁰

The basic principle is alteration of reflex pain pathways with the use of vaginal or anal stimulators and and percutaneous stimulators of posterior tibial nerve, which shares a common nerve root with the innervation of bladder. Neuromodulation of pudendal nerve eases out the mechanism of voiding by releasing of abnormal guarding reflexes both at the level of the brainstem and the bladder. Simultaneously, there is activation of pelvic efferent hypogastric sympathetic nerves which maintains continence.

There are two types of neuromodulation:

- Implanted sacral nerve stimulator (Interstim)

This device targets S3 and includes an IPG (Implantable Pulse Generator) implanted in buttocks. It is inserted in two phases – test phase and the implantable phase. Success has been defined as 50% or greater

reduction in symptoms. If test phase reports >50% symptom reduction after 3-4 weeks, then it is finally implanted with a long term battery and a neurostimulator in the buttock and lower back. Safety profile of Interstim is excellent with minimum side effects- infection and chronic pain. Success rate is 56-68%, upto 80% with $p < 0.001$.

- Percutaneous tibial nerve stimulation¹⁰

A 34 G needle is placed 5 cm above the medial malleolus to access the posterior tibial nerve and cause stimulation of L4 to S3 nerve roots. It can be done in office setting for a period of 30 minutes every weekly for 12 weeks with subsequent monthly treatments.

E. Other treatments

- Intravaginal Estrogen
- Extracorporeal magnetic innervation¹⁰ - used for mild incontinence
- Diversion Clam Ileocystoplasty³ - augmentation procedures, especially for patients with neurogenic detrusor³

F. Alternative Therapy-

Those who are not ready for treatment have been also shown to benefit from Acupuncture

Newer drugs currently under research are monoamine reuptake inhibitors, serotonin receptor acting agents, agents acting on NO/cyclic Guanosin Monophosphate Pathway(cGMP), PG Receptor antagonists

Treatment of OAB is basically a multimodal approach and usually, a combination of therapies will benefit the patients. The success here is defined mainly by relief of symptoms rather than cure. So, the primary aim remains management of symptoms and improvement of quality of life.

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Role of Pelvic Floor Muscle Training and Bio-feedback in Pelvic Floor Dysfunction

Hegde A¹, Thariani K²

¹Associate Professor (Hon), Urogynecology, Cama Hospital, Grant Medical College, Mumbai, Founder and Director, C.U.P (Center for Urogynecology and Pelvic Health), New Delhi, Founder, Chairperson, Managing Trustee, ARMMAN, Mumbai, ²Consultant Urogynecologist, Center for Urogynecology and Pelvic Health, New Delhi

1. Introduction

Pelvic floor dysfunction (PFD) is a term that describes a group of interrelated conditions such as incontinence, voiding dysfunction, pelvic organ prolapse, anorectal dysfunction and sexual dysfunction which may often occur together due to common risk factors affecting the integrity and function of the pelvic floor¹. PFDs are a common problem affecting more than 50% of women². Although, these conditions are not life threatening, they can have serious effects on a woman's quality of life causing distress, social embarrassment and low self-esteem³. The pathophysiology of PFDs is multifactorial and includes factors such as childbirth, menopause, obesity, age, genetics and other comorbid conditions⁴.

Several treatment modalities exist for the management of the PFDs, such as conservative options like pelvic floor muscle exercises, life-style modifications, medical and surgical management options. As a general rule in medicine, the least invasive option with minimum adverse effects should be offered first to the patient⁵. Pelvic floor muscle training (PFMT) meets the above criteria for the PFDs and hence is now considered the first line treatment for most PFDs⁶.

2. Pelvic Floor Muscle Training: A peep into the history!

Pelvic floor muscle training has been a part of exercise regimens for over 6000 years. It entered the modern medicine in the 1930s when a scientific paper by Moris et al described that voluntary tightening and relaxation of the pelvic floor muscles may increase their strength, thereby preventing PFDs⁶. However, it gained popularity only after the mid 1900s, when Arnold Kegel reported successful treatment of over 60 cases of incontinence using pelvic floor muscle exercises with pressure biofeedback⁽⁷⁾.

3. How does PFMT work?

Most PFDs tend to arise due to abnormalities in the structure and function of the pelvic floor. The muscular components of the pelvic floor are collectively known as the levator ani and are affixed to the bony pelvis. These muscles provide support to the pelvic organs, as well as the abdominal contents. Due to the erect posture of the humans, these muscles must provide tonic support that is resistant to fatigue. Therefore, majority of muscle fibers of the pelvic floor are type II, slow-twitch fibers. In order to counteract the suddenly increased intra-abdominal pressures, such as a cough or sneeze, a component of fast-twitch muscle fibers provide reflex, or voluntary, extra support to the slow-twitch basal tone⁸.

Imaging techniques have shown a reduction in levator volume and thickness with increasing age and parity with a reduction in fast twitch fibers with increasing age. PFMT acts by restoring the muscle strength and volume to a degree comparable to controls and therefore helps in treating PFDs⁸.

4. PFMT with bio-feedback

To achieve the best results of PFMT, it is important to perform the maximum contraction of the correct muscles. It has been observed that most women suffering from PFDs have poor recognition of their pelvic floor muscles, they often contract the abdominal, gluteal or adductor muscles during attempts to maximally contract the pelvic floor. Even those who identify the pelvic floor push when asked to contract. Incorrectly done PFMT not only fails to bring about improvement but can also often lead to worsening of the PFD.

The above mentioned statement highlights the role of bio-feedback. Biofeedback is defined as a training technique which has an external

electrical sensor to show signals on physiological functions in order to manipulate the recorded activity and enable an individual to gain some elements of voluntary control at will⁹.

Biofeedback can enhance the awareness of correct muscle contraction and motivation to practice repetitively this correct response through visual, auditory, and tactile means and enable the female to learn to control and improve their PFM function⁹. Biofeedback as a rehabilitative training program is used in different fields in order to improve educational performance. The success of the treatment in biofeedback therapy depends on patient's effort, motivation to the program, an appropriate developmental age (older than 5 years), and a safe and practical environment with a specially educated professional⁽¹⁰⁾.

5. The process of bio-feedback

Bourcier and Burgio described four main stages of pelvic floor muscle training that include¹¹:

- i. **Education and awareness of specific musculature:** Multichannel biofeedback devices help in this.
- ii. **Muscle strengthening:** Bio feedback helps in activation of both slow and fast twitch fibers by means of slow- sustained, fast and a combination of contraction patterns.
- iii. **Reflex, or automatic muscle activity:** This involves using the correctly recognized muscle voluntarily in response to a particular event. That is pre-contraction of levators in anticipation of cough or sneeze, helps in preventing incontinence both by detrusor overactivity and stress induced.
- iv. **The application of these new skills in activities of daily life**

6. Instruments of biofeedback

The instruments used in biofeedback may include a pressure perineometer and/or real time diagnostic ultrasound and a computerized surface electromyography (EMG) biofeedback unit.

- a. **The perineometer** is a pressure manometer that measures maximum pelvic floor strength by vaginal squeeze pressures. There are several advanced units on the market that

display maximum strength and endurance of the pelvic floor muscles by measuring vaginal and rectal pressure in millimeters of mercury (mmHg) or centimeters of water (cmH₂O). A hand held perineometer with a vaginal probe connected to a measuring device detects pressure changes in millimeters of mercury as the patient performs a pelvic floor muscle contraction¹².

- b. **Transperineal Real Time Ultrasound** can also be used as a biofeedback tool as USG can detect levator ani muscle activity^{13,14}.

- c. **Surface electromyography (sEMG)** biofeedback provides auditory & visual feedback and allows quantitative measurement of pelvic floor muscle group activity in conjunction with other muscle groups that are in close proximity to the pelvic floor (abdominal, gluteal, or hip adductor muscles)¹⁵. Muscle activity is measured in microvolts on the computer display and gives instant visual and auditory feedback to the patient. The equipment is able to store session data for future reference and analysis. Surface electrodes or a vaginal or rectal sensor is utilized depending on the anatomical limitations, age of the patient, pain levels or patient preference. Surface electrodes are a preferred method with patients who are unable to insert or tolerate a sensor placed vaginally or rectally. Surface electrodes are better adapted for pelvic floor assessment in functional positions such as sitting or standing.

The pelvic floor biofeedback units have pre-programmed protocols to facilitate measurement of pelvic floor muscle baseline resting EMG activity, with alternating work and rest intervals. Quick or prolonged pelvic floor muscle contractions are measured and compared to other examination findings.

7. Role of Physiotherapy and biofeedback in the management of PFDs

7.1. Physiotherapy and biofeedback in the management of urinary incontinence

Pelvic floor muscle training with or without biofeedback and electrical stimulation has now become the first line in the management

of urinary incontinence, both stress and urgency. Recent evidence has clearly shown that the underlying causes of urinary incontinence, particularly decreased pelvic floor muscle strength and/or endurance, can be treated with encouraging results with the help of physiotherapy. The effectiveness of PFME in patients with urinary incontinence is determined both by the frequency and intensity of the exercises. Performing sufficient number of repetitions of specific duration of contraction in an exercise program that includes three sets per day for a period of at least 12–20 weeks is important to obtain satisfactory results¹⁶.

In patients with stress urinary incontinence, this exercise program needs to be combined with instructions on the “Knack” principle, which is a counterbalancing technique which teaches how to contract the pelvic floor muscle just prior to physical stresses such as sneezing. It must be remembered that maximal effect of strength training does not occur before 5 months of training¹⁶.

Though recent evidence does not suggest that body position during exercise does not have any impact on the success of the program, most physiotherapists utilize exercise progression from gravity-eliminated to anti-gravity positions and finally an unstable base of support when strengthening the pelvic floor muscles. Greater gains in motor performance occur when practice resembles a functional task as much as possible.

PFMT can also be used in the management of urgency urinary incontinence (UUI). The biological rationale is based on Godec’s observation that a detrusor muscle contraction can be inhibited by a pelvic floor muscle contraction induced by electrical stimulation. Thus, voluntary pelvic floor muscle contractions may be used to control UUI⁶. After inhibiting the urgency to void and the detrusor contraction, the woman can reach the toilet in time to avoid urine leakage. However, the number, duration, intensity and timing of the pelvic floor muscle contraction required to inhibit a detrusor muscle contraction is not known.

7.2. Physiotherapy and biofeedback in the management of Defecation Disorders (DD) and Anal Incontinence

In patients of defecatory disorders (DD), PFMT with bio-feedback helps by:

1. teaching patients about disordered defecation
2. coordinating increased intra-abdominal pressure with pelvic floor muscle relaxation during evacuation
3. practice simulated defecation with a balloon; and, where needed
4. provide sensory retraining for restoring the sensation of rectal filling
5. In anal incontinence, they help by increasing the pelvic floor muscle strength

A retrospective review from a tertiary referral center reported that of those who underwent at least five biofeedback sessions for DD, 60 % reported subjective short-term improvement¹⁶.

7.3. Physiotherapy and biofeedback in the management of Pelvic Organ Prolapse

POP occurs when there is weakness of the pelvic floor and connective tissue attachments to the bony pelvis allowing abnormal descent or herniation of the pelvic organs (uterus, vaginal apex, bladder, or rectum) from their normal position in the pelvis leading to distressing symptoms. By improving muscle strength and coordination with PFMT, the resting position of the uterus, bladder, and rectum can be elevated to decrease symptoms, reduce POP-Q stage, and improve quality of life. The 2013 International Consultation on Incontinence report concluded that there is level 1, grade A evidence to recommend PFMT in treatment of POP¹⁷.

7.4. Physiotherapy and biofeedback in the management of Sexual Dysfunction (Vaginismus)

Dyspareunia is characterized by pain during sexual intercourse or vaginal penetration and vaginismus is characterized by a spasm of the perineal musculature making vaginal penetration difficult¹⁸. PFMT is an important treatment strategy in the multidisciplinary

approach to dyspareunia and vaginismus as it improves muscle relaxation, normalizes resting muscle activity, increases vaginal elasticity, muscle awareness, and proprioception. A recent RCT randomized 42 women with dyspareunia to receive PFMT or lower back and abdominal physical therapy. Patients who received PFPT showed significant improvement in pain ($P < 0.001$), overall quality-of-life scores ($P < 0.001$), and overall sexual function ($P < 0.018$), compared with patients who did not have pelvic floor training¹⁹.

Conclusion

Pelvic floor physiotherapy with bio- feedback plays an important role in the armamentarium against PFDs. Although a great deal of attention is paid to new and expensive pharmacotherapy, scientific data suggests that behavioral therapy, and pelvic floor muscle treatment can be equally, or even more, effective than drug therapy. Moreover, in severe cases a combination of PFMT with bio-feedback and medical treatment may show even better outcomes. These interventions have a higher success rate among younger women with high motivation, less advanced pelvic floor dysfunction, and less severe symptomatology.

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Role of Burch Colposuspension in the Current Scenario. Is it time to revisit this surgical technique?

J B Sharma¹, Janmeeta Singh², Rajesh Kumari³

¹Professor, ²Research Officer, ³Associate Professor, Obstetrics and Gynecology Department, AIIMS, New Delhi

Stress urinary incontinence (SUI) has been defined by the International Continence Society (ICS) as any involuntary leakage of urine with activities which result in increased intra-abdominal pressure like coughing, sneezing, laughing, climbing stairs and sporting activities¹. Prevalence of SUI varies markedly in different countries, being approximately 18% in India to 26.4% in USA^{2,3}. These rates are predicted to increase in the coming years secondary to an aging population. Factors predisposing to SUI are mainly increasing parity especially vaginal deliveries, obesity, menopause, chronic obstructive airway disease, smoking and family history.⁴

The diagnosis is made as per the Third International Consultation on Incontinence in 2005, by assessing symptoms (including frequency, volume chart and questionnaire), estimating quality of life and need for treatment, abdominal and pelvic examination, cough stress test to ascertain SUI, examining voluntary pelvic floor muscle contraction and evaluating post void residual urine⁵. Numerous questionnaires have been used for diagnosis of SUI and for its influence on the quality of life like Incontinence Impact Questionnaire⁶, International Consultation on Incontinence Questionnaire (ICIQ) score⁷. Urodynamic studies though not recommended for routine diagnosis of SUI in all cases are useful to confirm the diagnosis of SUI and to rule out detrusor overactivity.⁸

SUI is graded I (mild SUI), grade II (moderate SUI with moderate stress) and grade III (severe SUI even with slight activity).⁴

Pathogenesis

SUI mainly occurs due to two reasons:-

Urethral hypermobility- Urethra & bladder neck are supported by pubourethral ligaments, vagina and its lateral fascial condensations, arcus tendineus fascia pelvis and levator ani muscles. In cases of childbirth

trauma, proximal urethra is displaced down and is no longer an abdominal organ. Hence, with any increase in intra- abdominal pressure, the intra-vesical pressure exceeds intra-urethral pressure causing leaking of urine. This theory is also the basis of Burch's colposuspension which intends to bring urethrovesical junction and proximal urethra back into the abdomen.

Intrinsic sphincter deficiency (ISD) - Urethral integrity is maintained by urethral mucosal coaptation, urethral vascular plexus, muscular layer consisting of smooth & striated muscles. Defects in any or combination of these components can cause ISD. Theoretically colposuspension operations will be less successful in ISD. Sling procedures, pelvic flow exercises, and injection of urethral bulking agents are more useful for ISD.⁴

Management

Initial treatment for SUI includes lifestyle interventions like weight reduction in obese women, smoking cessation, fluid restriction, estrogen replacement therapy in postmenopausal women.⁴

Conservative management includes supervised pelvic floor muscle training and bladder training for at least 8 weeks. Also, insertion of weighted vaginal cones, electrical stimulation of pudendal nerve, use of vaginal pessaries, urethral occlusive devices and drugs (Duloxetine) have been tried in mild and moderate SUI.⁴

Surgical Management⁴

Surgical treatment is usually required for most cases of SUI especially when conservative treatment fails and the patient wants definitive treatment and for severe SUI. Following options are available for surgical treatment:⁴

- **Kelly's plication**- Three sutures are placed at bladder neck on peri-urethral tissues with vicryl

2-0. Although still performed along with prolapse surgery by many traditional gynecologists especially for mild to moderate SUI, it has poor long term success rates (about 50%).

- **Burch colposuspension-** It used to be a gold standard treatment for stress urinary incontinence with highest success rate (85–90% at 1 year and 70% at 5 years) but as it is a major operation with increased morbidity, needing skilled experts and since the introduction of the midurethral sling (MUS), its practise has decreased incredibly.^{4,9} However, due to recent panic about mesh erosion due to artificial tapes after the 2011 FDA notification on complications of transvaginal mesh, there is immense hesitation in their use and they are no longer available in many countries causing resurgence of Burch procedure. It continues to play an important role for treatment of stress urinary incontinence. Burch colposuspension should be contemplated as an apt surgical procedure for a woman with SUI, particularly if mesh insertion is a contraindication, concurrently when intra-abdominal surgery is previously planned or if access to vagina is restricted.¹⁰
- **Marshall-Marchetti-Krantz (MMK) operation-**In this operation, 3 pairs of non-absorbable sutures are placed on either side of urethra (starting from bladder neck) and to the periosteum at the back of pubic symphysis. It can cause osteitis pubis in 2.5%-5% cases and is no longer performed and has been replaced by Burch's colposuspension.
- **Traditional pubovaginal slings-** In these procedures, a strip of rectus fascia/ fascia lata is placed under bladder neck & through the retro-pubic space, the ends are stitched to rectus sheath in lower anterior abdominal wall. Due to higher rate of complications, these procedures are rarely done in modern practice. They were done in past for SUI due to ISD (Intrinsic sphincter deficiency) and for previously failed continence surgery.
- **Mid-urethral slings-** These slings try to recreate structural support of pubourethral ligaments, suburethral vaginal hammock and pubococcygeus muscles. These are the treatment of choice being minimally invasive, faster recovery, high efficacy (80–90% success) with low risk of complication, but skilled training is required and

they are expensive. A polypropylene mesh is put midurethrally to come out in groin through obturator foramen (TOT) or through anterior rectus sheath (TVT).

- **Tension-free vaginal tape (TVT)-**There is a bladder injury risk of 6-8%, also there is risk of retropubic space vessel injury. Long term studies of upto 15 years have proven its efficacy & safety with almost 87% success rate.
- **Transobturator tape (TVT-O)-**It is easier and simpler than TVT but almost equally effective with minimal risk of urethral and bladder injury. There is more incidence of groin pain injury. The 5-year success rate varies from 73-92% though less data is available on long term efficacy as compared to TVT.
- **Minisling/ Microsling-** In this method, polypropylene mesh is placed across and beneath the midurethra. The mesh does not perforate obturator membrane. Though the groin pain is less, but long term results are poorer than standard TVT and TOT.
- **Urethral bulking agent injection-** Peri-urethral injection of synthetic bulking agents are inserted in the submucosa of proximal and midurethra under cystourethroscopy. It leads to rise in urethral coaptation. It is especially useful in cases of ISD, scarred & fixed urethra with SUI.
- **Artificial urinary sphincter-** It is considered as the last option for intractable SUI and is very expensive. It consists of an inflatable cuff, a balloon to control pressure & a pump.

Burch Colposuspension (Retropubicurethropexy)-

In 1961, Dr John C. Burch first specified the Burch procedure where originally he attached paravaginal fascia to the arcus tendineus fascia pelvis.⁹ This fixture site was then amended to Cooper ligament so as to maintain a more steady attachment. It was then again changed to its present scenario in 1978 when Tanagho fixed the paravaginal sutures more distally from the urethra and the tissues secured loosely.^{10,11}

Mechanism of Action

Burch colposuspension is mainly useful for SUI due to urethral hypermobility, and is

much less effective in incontinence because of intrinsic sphincter deficiency (ISD). It anatomically reinforces the bladder neck and avoids urethral mobility during Valsalva maneuver as observed in imaging studies conducted before and after Burch procedures, which depicted that cure rates postoperatively are linked with a shorter distance between the bladder neck and levator ani.^{10,12}

Open Burch Colposuspension

Steps involved are:⁴

1. Patient is laid in lithotomy position. Foley catheter is inserted through urethra, and the bulb is inflated. One assistant is needed to assist from the vaginal end.
2. General or spinal anesthesia is given. Low transverse incision is given on abdomen.
3. Rectus sheath is cut, muscles are separated. Peritoneum is not opened.
4. Blunt dissection with fingers is carried out between lower abdominal wall peritoneum and pubic symphysis in the 'space of Retzius'. Loose areolar tissue in this space separates easily.
5. Bladder neck and urethra are mildly pushed down from pubic bone. Bladder neck [identified by inflated bulb of Foley's catheter] and urethra [identified by length of Foley's catheter] are recognized by giving gentle traction on catheter.
6. Assistant from vaginal end provides exposure by lifting vagina on one side of urethra near bladder neck with finger covered with thimble or sponge holding forceps.
7. Deep non-absorbable (1–0 nylon or prolene) suture in the near full thickness of vagina (except the vaginal epithelium) is taken 1.5–2 cm lateral to bladder neck. It is secured with artery forceps.
8. Another suture is placed 1–2 cm distal to it in paraurethral area. Similar two sutures are taken on the opposite side with lifting of opposite vaginal wall by the vaginal assistant.
9. All the sutures are then passed through the ipsilateral iliopectineal (Cooper's) ligaments (about 5 cm lateral to pubic symphysis on superior pubic rami) on both sides. The knots are then tied (6 knots) without making too tight sutures (to avoid over-correction of

urethrovesical junction and prevent urinary retention).

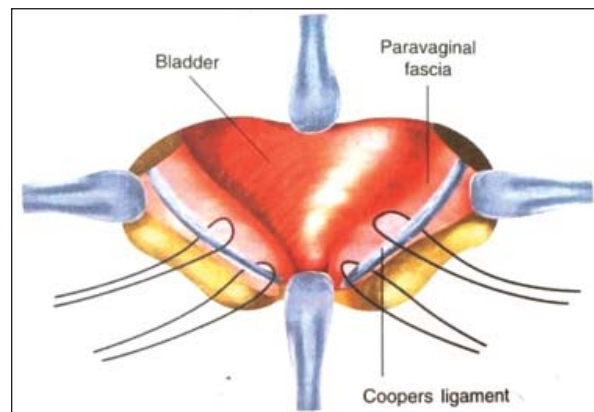
10. Cystoscopy can be performed to identify any wrongly placed suture in urethra or bladder (which should then be removed and new suture placed).
11. Antibiotics should be given for 5–7 days.
12. Foley's catheter is usually kept for 3–5 days. It is removed on 5th day and patient is discharged once she passes urine.

Advantages⁴

- i. It has highest long term success (85–90% at 1 year, 70% at 5 years) and is gold standard.
- ii. It can be combined with abdominal hysterectomy if needed

Disadvantages⁴

- i. It is a major operation and needs technical skill
- ii. More bleeding
- iii. Higher chances of voiding dysfunction



Diagrammatic Representation of Burch's Colposuspension

Sharma JB. Textbook of Gynaecology. New Delhi: Avichal Publishing Co.; 2018:Pg 400

Laparoscopic route (intra-peritoneal approach): If the surgeon is well trained, Burch colposuspension can also be done laparoscopically. Results are almost similar (slightly lesser long term success) to open Burch Colposuspension. Although in the laparoscopic approach, It has the benefit of decreased blood loss, lesser postoperative pain and faster recovery.⁴

Steps involved are:¹⁰

- A 10-mm port at the umbilicus is kept for the

camera, and two 5-mm lower lateral working ports are placed on either side of the abdomen.

- In order to delineate the outline of bladder, it is filled retrogradely.
- The space of Retzius is then opened sharply in a crescent shaped manner to approach the bladder neck and periurethral tissue.
- Suture placement and postoperative care are similar to the open procedure from this point on.

Advantages⁴

- It has benefit of being minimally invasive injury,
- Decreased blood loss,
- Lesser postoperative pain
- Faster recovery.

Disadvantages¹⁰

- The operating time is longer.

A study by Carey et al. showed that there were no significant differences in cure after open and laparoscopic Burch colposuspension in 200 women with SUI after 5 years of follow-up. Despite operating time being prolonged, there was decreased amount of blood loss and postoperative pain in laparoscopic surgery.¹³

Long -Term Efficacy: As Burch colposuspension has been in usage for a long time, this procedure has extensive data regarding follow-up, with cure rates up to 85% to 90% at 5-10 years after the procedure.¹⁴⁻¹⁶

Complications

Complications of Burch colposuspension have been reported in many studies¹⁰. They are listed in Table1.

- Hematoma formation may occur in postoperative period
- **Voiding dysfunction** in immediate postoperative period can be noted but the possibility of urinary retention that needs catheterization for longer duration more than 1 month is low in most studies which reported incidence to be less than 3%. De novo detrusor instability is proven to be mostly affected with voiding function preoperatively.
- Apical prolapse- As the Burch procedure causes lifting of the anterior vaginal wall , this may lead

to weakness of the posterior vaginal wall and may cause enterocele formation.

Table 1: Complications of Burch Colposuspension¹⁰

Complications	Incidence
Postoperative Hematoma	0.7% - 3%
Bladder Injury	0.4% - 9.6%
Ureteral Kinking	0.2% - 2%
Urinary Tract Infections	4% - 40%
Wound Infections	4% - 10.8%
Voiding Dysfunction (Immediate)	<25%
Long-term Urinary Retention	0.7% - 7%
De Novo Detrusor Instability	3%–8%
Long-Term Dyspareunia	2% - 4%
Groin Or Suprapubic Pain	2% to 6%
Apical Prolapse	12% - 17%

Summary

Even though there was declining trend of Burch procedure, it still holds a preeminent place for the surgical treatment of SUI especially in the present era where use of artificial meshes is being avoided due to their potential complications and adverse publicity. Burch colposuspension should be contemplated as an apt surgical procedure for a woman with SUI, particularly if mesh insertion is a contraindication, alongside when intra-abdominal surgery is previously planned or if access to vagina is restricted.

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Recurrent Urinary Tract Infections

Thariani K¹, Hegde A²

¹Consultant Urogynecologist, Center for Urogynecology and Pelvic Health, New Delhi, ²Associate Professor (Hon), Urogynecology, Cama Hospital, Grant Medical College, Mumbai; Founder and Director, C.U.P (Center for Urogynecology and Pelvic Health), New Delhi; Founder, Chairperson, Managing Trustee, ARMMAN, Mumbai

1. Introduction

Urinary tract infections (UTI) are acute bacterial infections of the urinary tract and include a spectrum of conditions ranging from asymptomatic bacteriuria to life threatening pyelonephritis¹. They are much more common in females, accounting for over 10 million patient visits clinically with a country wide prevalence of more than 35%². The lifetime risk of a woman developing UTI is almost 50%, leading to significant morbidity and deterioration of quality of life³. UTI in women are often **recurrent**, defined as **2 uncomplicated UTIs in 6 months or, as 3 positive cultures within the preceding 12 months**⁴. After an initial UTI, 20-30% of women will get a second UTI within 6 months and 3% will experience a third UTI within that period⁵.

2. Classification of Recurrent UTI

Recurrent UTI (rUTI) is a source of considerable distress to the patient, , hence while evaluating these patients it is important to differentiate between **bacterial reinfection** and **bacterial persistence**. The management of these two conditions is likely to differ. A re-infection is defined as recurrent UTI caused by a different bacterial isolate, or by the previously isolated bacteria after a negative intervening culture or an adequate time period (2 weeks) between infections. These infections are generally associated with high host susceptibility. Whereas, bacterial persistence implies an incompletely treated infection with persistence of the bacteria in the urinary tract and is generally associated with anatomical or functional abnormality of the urinary tract⁴.

3. Risk Factors

Women have a much higher incidence of UTI than men, this can be explained by the presence of several predisposing risk factors associated with the female gender such as short urethral length, close proximity of the urethral opening

to the vaginal and anal opening, sexual activity, pregnancy and menopause⁶. An episode of uncomplicated UTI increases the risk of having a second episode and therefore may predispose the woman to recurrent UTI⁷. Other risk factors for recurrent UTI are:

1. Menopause
2. Functional disability
3. Recent sexual intercourse
4. Prior history of urogynecological surgery
5. Incomplete bladder emptying (elevated post-void residual)
6. Accidental bowel leakage
7. Urinary Incontinence
8. Pelvic organ prolapse
9. Diabetes

4. Etiology of UTI

UTIs may be caused by a variety of bacteria such as *Staphylococcus saprophyticus*, *Pseudomonas* spp., *Enterobacter* spp., *Serratia* spp., *Citrobacter* spp., *Klebsiella* spp., *Proteus* spp., *Enterococcus* spp. And *Staphylococcus* spp. Nonetheless, the main causative pathogen involved in recurrent UTI in women is *E. coli* which accounts for 80% of all episodes of infection. Other significant pathogens include *Staphylococcus saprophyticus* (8%), *Klebsiella pneumoniae*, and *Proteus mirabilis*¹. *Candida albicans* and *mycobacterium tuberculosis* may cause infections in immunocompromised women.

Most *E.coli* strains are commensals in the large intestine of humans and animals and do not carry any virulence factors. There are certain extra-intestinal pathogenic strains of *E.coli* (ExPEC) which carry virulence associated factors and may be responsible for causing extra-intestinal diseases. The most common type of ExPEC is Uropathogenic *E.coli* (UPEC), which is most commonly found in UTI patients⁶.

5. Pathogenesis of rUTI: Figure 1 shows the different steps in pathogenesis of rUTI.

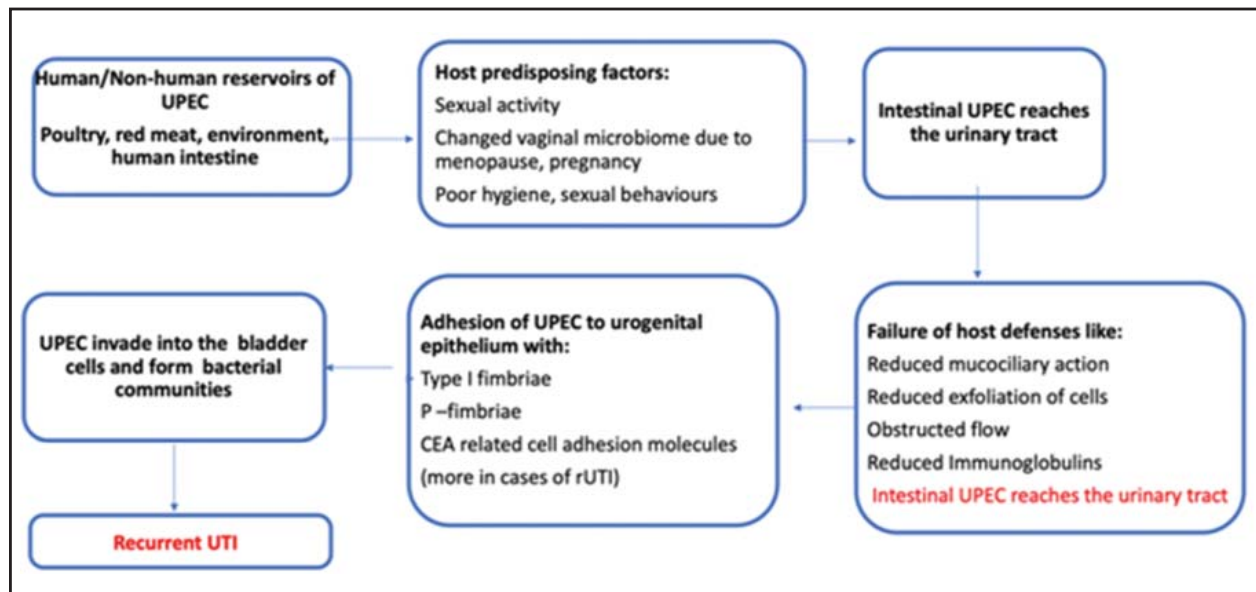


Figure 1: Pathogenesis of rUTI

6. Presentation

UTIs result in inflammation of the urinary tract hence patients may present with symptoms of:

1. Dysuria
2. Urinary frequency
3. Urgency
4. Suprapubic pain
5. Hematuria
6. Low back pain
7. Nocturia

Besides these typical symptoms, older women may report other symptoms as well, such as foul odor, incomplete bladder emptying, worsening of incontinence, constipation, altered mentation and generally feeling ill⁸. Symptoms of fever, tachycardia, or costovertebral tenderness should raise concern for an upper tract UTI, such as pyelonephritis.

Women with recurrent UTI can often self-diagnose on the basis of symptoms very accurately, with an 84% positive culture rate⁹.

7. Evaluation- This should include:

1. A focused history: detail history including history of:
 - a. Age of first UTI
 - b. No. of previous culture proven UTI episodes, investigations and treatment
 - c. Lower or upper UTI symptoms

- d. Persistence of symptoms despite negative culture
 - e. Urinary incontinence
 - f. Any association of symptoms with sexual intercourse
 - g. Sexual and contraceptive history
 - h. Past medical history: diabetes, neurological disease, any previous urolithiasis, previous surgeries, any urinary tract instrumentation
 - i. Any long term medications
2. Examination: look for
 - a. Signs of urogenital atrophy or any obvious urethral/ vaginal mass or swelling
 - b. Pelvic organ prolapse
 - c. Post void residual urine
 - d. Neurological examination
 - e. Renal size and tenderness
 3. Urine analysis: Gold standard test for diagnosis of recurrent UTI is urine routine microscopy and culture of a mid-stream clean catch urine sample. In a recent study by Aisen et al. it was found that among women with vague UTI symptoms or recurrent UTI, it may be useful to obtain catheterized samples so as to prevent the overdiagnosis of UTIs rather than relying on clean catch samples¹⁰. The sample should ideally be processed as soon

as possible. The microbiological criteria for diagnosing UTI are not arbitrary but based on a series of experiments that correlate UTI syndromes with the quantity of organisms in urine.⁴

- UTI is diagnosed if > 100 000 colony forming units/ HPF or
- In women with symptoms of a UTI > 1000 colony forming units/ HPF is considered sufficient to document infection

Despite common use, the standard culture has limitations that may be especially pertinent for clinicians providing care for women with rUTI as they are not able to detect all relevant uropathogens^{11,12}. New urine culture techniques are now available to detect these microbes¹². Unlike the standard urine culture, expanded quantitative urinary culture (EQUC) inoculates urine in diverse types of media, anaerobic conditions, varying temperatures, and time periods up to 5 days, with a lower threshold of detection than standard urine culture at 10 CFU/ml⁽¹²⁾. The use of EQUC may be considered in women with recurrent symptoms and equivocal or vague reports of standard urine culture, if the resources for carrying it out are available.

4. USG KUB: it may be done in patients of recurrent UTI to
 - o Rule out post void residual urine
 - o Bladder/ renal calculi
 - o Any other anatomic abnormality
5. Screening test to rule out diabetes
6. Cystoscopy: Not recommended in all cases, may be done in patients with gross hematuria, persisting pain or history of abdominopelvic malignancy⁵. In patients with rUTI, significant abnormality on cystoscopy may be seen in as many as 8% of patients¹³.

8. Treatment

The treatment of rUTI can be divided into:

1. Treatment of the acute phase and
2. Measures to prevent recurrences

8.1. Treatment of acute episode: Whenever possible treatment of the acute phase should be guided by the urine culture and sensitivity report. In cases where a culture is not available or there is a delay in reporting, the choice of antibiotic may depend on the previous culture reports or existing sensitivity and resistance patterns. The antibiotic may be changed later when the sensitivity testing is available.

The benefits of immediately starting empiric antibiotics include prompt symptom relief and decreased bladder inflammation; these benefits must be considered against the possibility of unnecessary or inappropriate antibiotic use, potentially contributing to growing antibiotic resistance. In cases of rUTI, patients may be given written prescriptions ordering a urine test whenever she develops symptoms without having to wait for a doctors appointment.

Table 1 gives details of anti-microbials which may be used in the acute phase. Choice of antibiotic should be made with considerations of efficacy, collateral damage and side effects. The aim of the treatment should be complete eradication of symptoms and infection.

If involvement of upper tracts is suspected then Nitrofurantoin and Fosfomycin should be avoided. Besides antibiotic treatment, it is also very important to provide symptomatic relief. The patient may be advised adequate hydration, pain relief measures like NSAIDS or Phenazopyridine which is a potent bladder analgesic.

Table 1: Commonly preferred antibiotics in the acute phase

Circumstances	Route	Drug	Dose	Duration
Healthy woman	ORAL	1. Nitrofurantoin 2. Fosfomycin 3. Pivemicillinam	100 mg B.D 3gm Stat 400 mg B.D	5 days Single dose 3-7 days
Age > 65yrs, diabetes, symptoms for > 7 days, recent UTI	ORAL	Trimethoprim-Sulphmethaxazole	1 DS tab B.D	7 days
Pregnancy	ORAL	Nitrofurantoin	100 mg B.D	5 Days

Traditionally, in most cases a repeat urine analysis, 1 week after treatment was advised to confirm eradication of infection. But in patients of rUTI, there is no consensus regarding a repeat urine culture following UTI treatment⁴. It can be useful for differentiating relapse vs. failure of treatment, for confirming uropathogen eradication and for documentation to support the diagnosis of rUTI rather than relapse or reinfection. Potential drawbacks of a repeat test include the clinical uncertainty for interpretation of a positive urine culture in the absence of patient symptoms⁷.

8.2 Prevention of recurrences

Prevention of further UTI episodes is a major component of management in women with rUTI. It may not be always possible to eliminate UTIs completely, but the frequency may be reduced significantly with the help of preventive measures. The preventive methods can further be divided into **antibiotic and non-antibiotic strategies**. Due to the rising concern of antibiotic resistance, non-antibiotic strategies should be tried before starting long term antibiotics. Some of the well characterized non antibiotic approaches are mentioned below:

1. **Estrogens:** Vaginal estrogens act locally in menopausal women and may help in restoring the normal vaginal microbiome, which may help in preventing UTI. Vaginal estrogen may be an effective prophylactic measure in postmenopausal women with recurrent UTI. Side effects may include breast tenderness, vaginal bleeding or spotting, non-physiologic discharge, vaginal irritation, burning. and itching. Topical estrogen in the trials involved the use of 0.5 mg of estriol cream vaginally every night for 2 weeks, then twice a week for 8 months⁷.
2. **Cranberry extract:** Cranberry extract contain *proanthocyanidin A*, this helps in inhibiting the adherence of type P fimbria of *E. coli* to uroepithelial cells, thereby reducing the incidence of UTI¹⁴. Different studies have shown the beneficial effect of cranberries in rUTI, although some conflicting results have also been reported^{15,16}.

3. Intestinal mechanical barrier agents:

Mechanical barrier protection is a new prophylactic approach for rUTI. Several studies support a protective effect of barrier agents such as gelatin or xyloglucan on intestinal mucosa. They act by forming a protective intestinal biofilm, reducing bacterial adherence, restoring intestinal integrity, modulating microbiota and reducing the number of UPEC in the intestinal tract which reduces the likelihood of contamination of the urethra-genital tract^{17,18}. The use of these agents remains to be definitively established.

4. **Life style modifications:** conservative measures have been advocated for prevention of recurrences for a very long time. Although no good quality evidence exists to prove their benefit, they still may be offered to patients. Some of these include:

- Avoiding spermicidal jellies
- Drinking plenty of water
- Voiding frequently
- Voiding after intercourse
- Avoiding use of tight clothing
- Avoid cosmetic bath products
- Avoid vaginal douches

5. **D- mannose:** Monosaccharide sugar which acts by inhibition of bacterial adherence to urothelial cells. It is available over the counter and has been shown to be superior to placebo in preventing rUTI¹⁹.

Antimicrobial prophylaxis: This should be considered only in patients in whom life style modifications and other non-antimicrobial strategies fail to work. This should only be started after the treatment of acute phase. Prophylaxis may be:

- a. **Low dose continuous:** Continuous antibiotics are effective in preventing recurrent UTIs. Success depends upon the effect that the anti- microbial agent has on vaginal and bowel bacterial reservoir. Drugs that reduce the pathogenic bacteria & do not increase resistance are ideal. A 6 month prophylaxis may be given if rUTI > 1 year.

Effective drugs are TMP-SMX or TMP alone, nitrofurantoin and cephalexin (in minimal dosage. This regimen has a 95% efficacy in reducing recurrences. In case of a break through infection a full course of antibiotics should be given and after treatment prophylaxis should again be restarted. Patients should be counselled about the risk of side effects of long term treatment.

b. Self-start intermittent treatment: It is for patients who do not want long term prophylaxis. The patient is given a dip slide device for culture and a 3 day course of empirical antibiotic. Patient can identify episodes of infection, perform their own culture and begin a standard 3-day course of antibiotics. They are asked to inform if symptoms present after 48 hrs. Only women who are motivated, compliant and willing for follow up should be chosen for this regimen. Effective drugs are Nitrofurantoin (100 mg twice a day for 5 days), TMP –SMX (160/800 mg one double strength tablet twice daily for 3 days), Fosfomycin (3 g single dose), Pivmecillinam (400 mg, twice daily for 5 days).

c. Post coital: Post coital antibiotic prophylaxis is another effective measure to prevent UTIs in women when sexual activity usually precedes UTI. Post-coital treatment involves taking a course of antibiotics within 2 hours of intercourse allowing for decreased cost and presumably side effects.

9. Referral to specialist: Specialist referral for recurrent uncomplicated UTI is indicated when risk factors for complicated UTI such as anatomic abnormalities, obstructed flow or voiding difficulties are present. Referral is also indicated when a surgically correctable cause of UTI is suspected or the diagnosis of UTI as a cause for recurrent lower urinary tract symptoms is uncertain².

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Complete Perineal Tear

Rajesh Kumari¹, Kavita Pandey², Jai Bhagwan Sharma³

¹Associate Professor, Obstetrics and Gynecology, ²Urogynecology Fellow, ³Professor, AIIMS, New Delhi

Introduction

Chronic complete perineal tear is characterised by disruption of the perineal body with division of the anal sphincter anteriorly and loss of the distal rectovaginal septum^{1,2}.

According to National Family Health Survey-4 (NFHS-4), the percentage of Institutional births in India has doubled from 38.7% to 78.9% in the decade to 2015-16. The overall rate of Caesarean deliveries in India is around 17% whereas the incidence of instrumental vaginal deliveries was 2.8% of all deliveries. In developing countries like India, significant number of deliveries still occurs at homes by traditional birth attendants resulting in varying grades of perineal injuries including third and fourth degree perineal tears. These are either not recognised at the time of delivery, not repaired as the patient does not go to the hospital or presents late in the post-partum period when primary repair may not be possible³.

During childbirth, many women sustain trauma to the perineum. The tears can involve the perineal skin, the pelvic floor muscles, the external and internal anal sphincters as well as the rectal mucosa. Trauma to the perineum during childbirth maybe either spontaneous or secondary to an episiotomy. Perineal trauma occurs in ~ 85% of women during a vaginal birth, with 60–70% requiring surgical repair⁴. In particular, occult injury to the anal sphincter complex may occur at the time of an otherwise uncomplicated delivery and, if neglected, can contribute to anal and fecal incontinence^{5,6}. Even when recognized and repaired, persistent sphincter dysfunction is considered to be the most common cause of postpartum anal incontinence^{1,2}.

Etiology⁷⁻¹²

- **Obstetrics causes:** This is the most common cause and occurs due to high risk factors such as over stretching of the perineum, in cases of big baby, prolonged labor, difficult labor, shoulder dystocia, occipito-posterior delivery. Instrumental delivery, midline episiotomy,

rapid stretching of the perineum, precipitate labor, breech delivery. Rigid perineum: elderly primigravida, vulvar edema, scarred perineum due to previous surgeries, previous perineal tear.

- **Traumatic causes:** sharp or blunt object injury, sexual violence injuries mainly due to forceful coitus in young or elderly women.
- **Surgical trauma:** Past failed surgery of on anal canal or perineum, or failed 3rd and 4th degree perineal tear repair.

Clinical presentation¹²: Patients who present for evaluation of fecal incontinence usually have had to overcome extreme embarrassment over their condition prior to their office visit. Care should be given to the manner to approach and to promote an open and comfortable discussion.

Diagnosis is made from careful obstetric history especially of a difficult natural vaginal delivery or instrumental delivery. Information about the number of vaginal deliveries and the presence of any risk factors for fecal incontinence pertaining to those deliveries should be obtained. History of prolonged second stage of labor, forceps delivery, significant tears, and episiotomy, among other causes, are associated with increased risk for anal sphincter disruption and pudendal nerve injury and detailed physical examination of the perineal area (table 1).

Symptoms

Fecal incontinence is variable depending on extent of damage to external sphincter. If there is mild damage than incontinence will be only for loose stools but for solid stool if sphincter is injured completely along with this flatus incontinence is usually seen.

Signs

Pain and redness is usually seen. On inspection perineum is usually absent. The red shining mucous membrane of anal canal and rectum and pink vaginal wall are seen lying together with hardly any

History components for women with suspected obstetric anal sphincter injury (OASIS)

Obstetric components	Surgical history	Gastrointestinal	Medication	Behavior
Duration of second stage of labor	Prior pelvic surgery: Reconstructive pelvic surgery	Known bowel disorders:	All regularly used medication	Use of protective pads or similar (tissue paper, rags) or clothing changes
Infant birth weight	Prior rectal surgery (eg, hemorrhoidectomy, perianal abscess, anal fissures)	Irritable bowel syndrome	Laxative	Avoidance of activities (eg, sex or exercise)
Obstetric laceration and degree, if known	Previous repair of CPT	Inflammatory bowel disorders (eg, Crohn disease, ulcerative colitis)	Fiber supplements	
Use of episiotomy and extension, if known Use of forceps or vacuum		Bowel function history: Frequency of bowel movements, Need to strain to defecate, fecal urgency, chronic diarrhea, difficult evacuation, solid, liquid or flatus incontinence, passage of stool through vagina	Stool softeners	

perineum in between. Two dimples (depressions) are present on either side of anus (roughly at 3 and 9 o'clock position) corresponding to the severed ends of external sphincter muscles. Radial folds of skin which are normally present all around the anal verge are now present only in posterior half (where external sphincter is present) but are absent in anterior half (where external sphincter is torn). On speculum examination: upper vagina and cervix are usually normal. On vaginal examination: Cervix and uterus are normal. Bilateral adnexa normal however lower vagina may be torn. On bimanual digital rectal examination: there is no grip on examining finger due to torn sphincter.

Investigations: This assessment should include both visual inspection and palpation. Adequate exposure, lighting, and analgesia are essential for a thorough examination. Usually diagnosis is made clinically (from symptoms and clinical examinations). Various tests which can be done to confirm the diagnosis and to assess the severity of this condition are endoanal ultrasonography and anorectal manometry, magnetic resonance imaging (MRI) may also be useful in some cases and other routine investigations¹³⁻¹⁶.

Management

Prevention: Proper conduction of delivery avoiding obstructed labor and difficult instrumental delivery can prevent most perineal tear¹⁷.

Treatment: treatment of choice for complete perineal tear is surgery. It can be done within 24 hrs of delivery or after 3 months and preferably before 6 months. Ideal time for repair is at 3 months is because by that time the infection and inflammation subsides, and nutritional status and general condition improve. Delaying beyond 6 months causes development of dense scar tissue making surgery more difficult¹⁸⁻²².

Preoperative Management²²⁻²⁴

Admit the patient 2 days before surgery. Low or non residual diet (liquid) is given, avoid full diet. Local vaginal douching with betadine or acriflavine to be done. Bacterial flora of intestine is controlled with tab neomycin 250mg thrice daily or metronidazole 400mg thrice daily. Bowel is emptied by peglac and enema.

Surgical Repair of Old Complete Perineal Tear (chronic perineal laceration)

Many different surgical techniques and approaches have been described in the literature for the repair of this deformity without much difference in long term outcomes^{18,19}. Most of these techniques require approaches which a gynecologist may not be familiar with or involve special training. Hence,

there is need of a surgical technique which is relatively simple to learn without compromising the anatomical, functional and long term outcomes.

The aim of reconstructive surgery is to restore the continuity of both the external and internal anal sphincters⁶. In addition, a thick perineal body and rectovaginal septum should be created to provide muscular and structural support in the thin area between the anterior anorectum and vagina. Proper reconstruction will also result in lengthening of the anal canal and restoration of a functional high pressure zone within it¹⁶.

Layered Method of Repair²⁵⁻²⁷

Under spinal or general anesthesia and after bowel preparation, the patient is put in lithotomy position. A transverse incision is made at the junction of vaginal and rectal mucosa and the incision is extended in the midline of the posterior vaginal wall. Rectal wall is separated from the posterior vaginal wall with careful sharp dissection. The ends of external anal sphincter are identified on both sides and are held with Allie's tissue forceps. Internal anal sphincter is seen as a white fibrous tissue between anorectal mucosa and external anal sphincter. The anal mucosa is closed with continuous 2-0 or 3-0 vicryl (delayed absorbable polyglyctin) sutures. The internal anal sphincter is then closed over anal mucosal sutures with 2-0 or 3-0 sutures. It gives strength to anal mucosal sutures. The ends of external anal sphincter are mobilized and are brought together over sutured internal anal sphincter. They are sutured together with two rows of delayed absorbable sutures (vicryl 1-0). They can be stitched as end to end or by overlapping (one sphincter partly covering the other sphincter) technique. The results of both procedures are similar. Levator ani (puborectalis) muscles are then brought together with interrupted delayed absorbable sutures. The bulbocavernous and superficial transverse perineal muscles are closed with 1-0 vicryl suture. The vaginal mucosa is closed with 1-0 or 2-0 vicryl suture. The perineal skin is closed with 1-0 or 2-0 vicryl. Postoperatively intravenous fluids are given for few days followed by light diet and stool softeners along with antibiotics.

FLAP Method for CPT Repair²⁵⁻²⁷

Preliminary workup, anesthesia and position is similar. Inverted V incision is given over posterior

vaginal mucosa. The flap of vaginal mucosa is dissected free from above downwards and is turned back downwards. The dissected vaginal flap is retracted downwards till the external anal sphincter ends are visible on both sides. The ends of external anal sphincter are caught with Allie's forceps on both sides and sutured end to end or with an overlapping technique with 1-0 or 2-0 delayed absorbable (vicryl or PDS) sutures. The levator ani (puborectalis) muscles are then sutured over external anal sphincter with no 1 vicryl suture. The vaginal mucosa is closed with continuous 1-0 delayed absorbable sutures. The redundant vaginal mucosa may be trimmed. Perineorrhaphy is performed by suturing bulbocavernosus, superficial transverse perineal muscles and perineal skin.

Post Operative Care: It is similar in both methods²⁸⁻²⁹.

Foleys catheter for 24 hrs. Nil orally for 24 hrs. Only Intravenous fluids are given for first 24 hrs. Then oral fluids (coconut water, tea, soup) are to be started on day 2. Syrup lactulose 15 ml twice daily is given from second day onwards to soften the stools. Usually patient passes stool on 3rd day. Antibiotics are given for about 5-7 days. Third generation cephalosporin along with metronidazole 500mg intravenously 8 hourly for 1 to 2 days then orally 400 mg thrice daily for 5-7 days. Neomycin can also be continued for 7 days to kill intestinal flora. Local betadine wash daily at the repair site should be done. Antiinflammatory agents (Ibuprofen with paracetamol with or without trypsin and chymotrypsin) can be given for 5-7 days.

Discharge Advice

Patient can be discharged on 6th or 7th day of surgery. To continue laxative (lactulose 15-20ml daily) for about 6 weeks. Contraceptive advice. Reassess after 6 weeks for any complications or residual disease. If any residual symptoms, anal ultrasound or MRI can be done to see any residual disease. Although future vaginal delivery with liberal mediolateral episiotomy can be performed, usually elective caesarean delivery is preferred to prevent perineal tear again.

Follow Up³⁰⁻³¹

Postoperative evaluation should be scheduled for 4-6 weeks after the procedure. At this time, most

postoperative swelling and tissue distortion is usually resolved. A history of the patient's bowel habits should be taken and problems addressed. If modification of the stool softener regimen is required, it can be done at this time. Additional follow up can be scheduled depending on the individual needs of the patient and practice of the surgeons.

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Journal Scan

Geeta Mediratta¹, Amita Jain²

¹Senior Consultant, Sir Ganga Ram Hospital, New Delhi, ²Senior Consultant, Urogynaecology, Medanta Institute of Urology & Robotic Surgery, Gurugram

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Women Living with a Midurethral Sling in Their 80s: Long-term outcomes

**Stavros Athanasiou¹ & Dimitrios Zacharakis¹ & Christos Kalantzis¹ & Athanasios Protopapas¹
& Ioannis Chatzipapas¹ & Themis Grigoriadis¹**

¹First Department of Obstetrics and Gynecology, National and Kapodistrian University of Athens "Alexandra" Hospital, 80 Vas.Sofias Avenue, 11528 Athens, Greece

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ABSTRACT

Introduction and Hypothesis: Surgical outcomes of elderly women who have been treated using midurethral slings could be influenced by confounding factors, such as age-related comorbidities. Aim of this study is to assess elderly patients (>75 years) who underwent a transobturator sling procedure with a follow-up of at least 13 years.

Methods: This is a prospective follow-up observational study including elderly women of current age \geq 75 years old who underwent TVT-O placement at least 13 years prior to the study period. Main outcome measures were the objective and subjective cure rates at the follow-up visit. Secondary outcome measures included: patient-reported success rate, de novo urgency symptoms rate, evaluation of other subjective parameters related to the lower urinary tract function, and assessment of the health-related quality of life.

Results: Seventy-two out of 85 women (84.7%) meeting the inclusion and exclusion criteria were assessed at the follow-up visit. The mean follow-up period was 13.7 years (SD = 0.8). The overall objective and subjective cure rates were 80.5% (58 out of 72) and 84.7% (61 out of 72) respectively, whereas 9.7% of the patients (7 out of 72) reported being subjectively improved. The patient-reported success rate was 91.7% (66 out of 72). De novo urgency rate was 23.7% (9 out of 38), whereas 26.5% of the patients (9 out of 34) reported aggravation of preexisting urgency.

Conclusions: In women of advanced age, the TVT-O procedure is a highly effective and long-lasting treatment. The safety profile of the TVT-O was not influenced by geriatric conditions, whereas the long-term presence of a polypropylene sling did not appear to trigger the onset of medical disorders.

Limitations

1. Major limitation of this study is the heterogeneity of the population regarding the presence of preoperative POP (Pelvic Organ Prolapse) and OAB (Overactive bladder, though this scenario is common in the daily clinical practice.
2. The relatively small number of patients may be considered another limitation regarding the evaluation of the long-term safety of this procedure.

Strengths

1. The present study reports TVT-O outcomes with the longest follow-up period in the literature so far and is the first study to investigate the well-being of women of advanced age who have been treated with MUS, evaluating the impact of ageing on the long-term efficacy and safety of this surgical procedure.
2. The validity of the results is enhanced by the prospective follow-up of the study population and by the use of validated tools for the assessment of the objective and subjective outcomes.

Comments

Although serious concerns have been raised recently regarding the safety profile of the synthetic MUS, leading to their discontinuation in some countries, no significant morbidity was observed in elderly women who carry an MUS for more than 13 years. Placement of the TVT-O is done in this study using a technique with minor modifications regarding the exit point of the needles, which is 1 cm medially, rather than 2 cm laterally in relation to the genitofemoral fold. Groin pain is the most common adverse effect of TVT-O slings and persistent groin pain has been reported in up to 3.8% of the patients and therefore many present guidelines are now advocating retropubic route over trans-obturator. But at follow-up in this study, none of the patients reported persistent groin pain and this could be attributed to the slightly modified technique. Obviously, this is only a hypothesis, which needs to be tested in prospective randomized trials.

The present study showed that the TVT-O procedure remains effective in women of advanced age with high cure and patient-reported satisfaction rates. However, a high prevalence of urgency symptoms was also observed, underlying the need for appropriate counselling. Therefore women can be reassured that ageing does not appear to compromise the safety profile of the TVT-O, and that the long-term presence of the polypropylene sling did not appear to trigger the onset of adverse effects.

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Using The Novel Pelvic Organ Prolapse Histologic Quantification System to Identify Phenotypes in Uterosacral Ligaments in Women with Pelvic Organ Prolapse

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Abstract

Background: Pelvic organ prolapse is common, but the underlying etiologies are poorly understood, which limits our current prevention and treatment options.

Objective: Our primary objective was to compare the uterosacral ligament histologic features in women with and without prolapsed using the novel pelvic organ prolapsed histologic quantification system. Our secondary aim was to determine whether composite histologic findings in uterosacral ligaments are associated with prolapsed risk factors.

Study Design: This was a prospective cohort study in which paracervical uterosacral ligament biopsies were performed at the time of hysterectomy for primary prolapsed or other benign gynaecologic indications and processed for histologic evaluation. The pelvic organ prolapsed quantification system was used to determine the prolapsed stage. In this study, 9 prominent histologic features were semi quantitatively scored using the pelvic organ prolapsed histologic quantification system in a blinded fashion and compared between prolapsed and control groups. Unbiased principal component analysis of these scores was independently performed to identify potential relationships between histologic measures and prolapsed risk factors.

Result: The histologic scores of 81 prolapse and 33 control ligaments were analyzed. Compared with the control group, women in the prolapsed group were significantly older and more likely to be in the menopausal phase. There was no difference in the number of vaginal deliveries, body mass index, hormone use, or smoking status between the groups. To control for baseline differences, patients were also stratified by age over 40 years and menopausal status. Compared with the control group, the prolapsed ligaments in the premenopausal group has significantly more loss of smooth muscle fibers within the fascicles (p less than .001), increased inflammatory infiltrates of neutrophils within the tissue and perineural

inflammatory cells (P less than .01 and $P = .04$, respectively), and reduced neointimal hyperplasia ($P=.02$). Prolapsed ligaments in the postmenopausal group exhibited elevated adipose content compared with that of the control group ($P = .05$). Amount of fibrillar collagen, total nonvascular smooth muscle, and muscle fiber vesicles of prolapsed ligaments did not differ in either the premenopausal or postmenopausal group compared with that of the control group. Unbiased principal component analysis of the histologic scores separated the prolapsed ligaments into 3 phenotypes: 1) increased adipose accumulation, 2) increased inflammation, and 3) abnormal vasculature, with variable overlap with controls. Posthoc analysis of these subgroups demonstrated a positive correlation between increasing number of vaginal deliveries and body mass index with increasing adipose content in adipocyte accumulation and inflammatory phenotype and increasing neointimal hyperplasia in the vascular phenotype. However, only the relationship between vaginal delivery and adipocytes was significant in the adipose phenotype ($R^2=0.13$; $P=.04$).

Conclusion: Histologic phenotypes exist in pelvic support ligaments that can be distinguished using the pelvic organ prolapsed histologic quantification system and principle component analysis. Vaginal delivery is associated with aberrant adipose accumulation in uterosacral ligaments. Our findings support a multifactorial etiology for pelvic organ prolapse contributing to altered smooth muscle, vasculature, and connective tissue content in crucial pelvic support structures. To confirm these associations and evaluate the biomechanical properties of histologic phenotypes of prolapsed, larger studies are warranted. Closing this gap in knowledge will help optimize personalized medicine and help identify targets for prevention and treatment of this complex condition.

Keywords: adipose, inflammation, neointimal hyperplasia, neutrophil, pelvic organ prolapsed, pelvic organ prolapsed histologic quantification, smooth muscle, uterosacral ligament, vaginal delivery.

Why Was This Study Conducted?

Pelvic organ prolapsed (POP) is common, but incomplete knowledge of contributing etiologies limits current prevention and treatment options.

Key findings

The pelvic organ prolapse histologic quantification (POP-HQ) system and principal component analysis of uterosacral ligament (USL) histologic features identified 3 histologic phenotypes of POP, of which 2 were associated with vaginal delivery.

What Does This Add to What is Known?

The POP-HQ is a novel tool that systematically classifies histologic features of pelvic floor ligaments. Distinct histologic phenotypes in USLs from women with POP exist. Understanding the etiologies leading to these varying histopathologic changes can facilitate personalized medicine for women with POP in the future.

Racial Differences in Urinary Incontinence Prevalence and Associated Bother: The Multi-Ethnic Study of Atherosclerosis

AkvarA, Liu K, Michos ED, et al. Racial differences in urinary incontinence prevalence and associated bother: The Multi-Ethnic Study of Atherosclerosis. *Am J Obstet Gynecol* 2021;224:80.e1-9.

Abstract

Background: Urinary incontinence is influenced by multiple factors, and the prevalence of urinary incontinence subtypes may differ by race and ethnicity.

Objective: This study aimed to determine the prevalence of urinary incontinence subtypes and associated bother among women by race and ethnicity.

Study Design: This cross-sectional analysis used data from the multi-Ethnic groups recruited from 6 communities from the United States. At the sixth follow up examination, urinary symptoms were ascertained with the International Consultation on Incontinence Questionnaire. The prevalence rate ratios of stress urinary incontinence, urgency urinary incontinence, and mixed urinary incontinence by race and ethnicity were calculated using generalized linear models for the binomial family while adjusting for covariates. The degree of bother was based on a scale of 0 (none) to 10 (greatest bother), and presence of any bother was defined as a score of ≥ 3 .

Result: Among the 1749 female participants in the Multi-Ethnic Study of Atherosclerosis who completed the sixth follow-up examination, 1628 (93%) completed the questionnaire. Women who did not complete the questionnaire were older than those who completed the questionnaire (average age, 82.2 [standard deviation, 9.5] vs 73.7 [standard deviation, 8.4] years; $P < .01$) and more likely to use diuretics (29.8% vs 18.9%; $P < .01$). Among those who completed the questionnaire ($n=1628$), 39.4% were white, 12.5% were Chinese, 27.2% were black, and 20.9% were Hispanic. After adjusting for covariates, stress urinary incontinence (prevalence rate ratio, 0.47; 95% confidence interval, 0.25–0.86) and mixed urinary incontinence (prevalence rate ratio, 0.58; 95% confidence interval, 0.38–0.89) regardless of bother scores were significantly less prevalent among black vs white women, although no significant racial and ethnic differences in stress or mixed urinary incontinence prevalence were noted for Chinese or Hispanic women vs white women. No racial and ethnic differences in the prevalence of urgency urinary incontinence were noted after the adjustment for covariates. Most women with urinary incontinence reported bother

scores of ≥ 3 regardless of race and ethnicity and urinary incontinence subtype, and bother scores did not differ significantly by race and ethnicity.

Conclusion: Frequency of urinary incontinence subtypes may differ by race and ethnicity, but older women who report urinary incontinence are likely to have associated bother regardless of race and ethnicity.

Keywords: *aging, bother, incontinence, mixed urinary incontinence, stress urinary incontinence, urgency urinary incontinence, women*

Why Was This Study Conducted?

Urinary incontinence (UI) and associated bother may differ by race, but previous studies included mainly white women, and data remain especially limited with regard to racial differences in bother associated with UI.

Key Findings

In this study, we found that among 1628 women from 4 different racial and ethnic groups who completed the International Consultation on Incontinence Questionnaire, stress UI was significantly less prevalent among black women compared with white women, although no association was noted between urgency UI and race ethnicity. Bother scores associated with UI did not differ by race and ethnicity, and most UI subtypes were associated with bother.

What Does This Add to What is Known?

This study shows that although UI subtypes differ by race and ethnicity, most cases of UI are associated with bother in women regardless of race ethnicity.

Proceedings of Virtual AOGD Monthly Clinical Meeting held at ESI PGIMSR, Basaidarapur New Delhi on 01st January, 2021

An Atypical Presentation of Post Caesarean Section Complication

Taru Gupta¹, Priyanka Mathe²
Sangeeta Gupta³, Divya Baruhee⁴

¹Professor & Head, ²Assistant Professor

³Consultant, ⁴Postgraduate Student

Retroperitoneal haematomas are extremely rare in obstetrics with unknown incidence. Till date the available data is only through the limited case reports which are the cases of retroperitoneal hematoma with ruptured aneurysms. Although, no case as such of retroperitoneal haematoma with iatrogenic bladder injury in post caesarean has been reported. We present a case of 29 yrs old, multigravida post caesarean who was referred to our centre ESI Basaidarapur for tertiary care management. She was postoperative day 6 of emergency LSCS done in view of Previous LSCS with scar tenderness. This caesarean was done at 36 weeks POG and patient delivered a male healthy baby of 3 kgs. In post operative period patient developed haematuria. Her blood investigations revealed deranged coagulation profile and KFT. Her haemoglobin fell from 13 mg/dl (preoperative) to 5.3 gm/dl on postoperative day4 for which she received 3 units of PRBCs and FFPs. Her haematuria was resolved but she was febrile. Her ultrasound revealed cholecystitis with ureteric calculi. She was referred to us in view of urosepsis with ureteric calculi with cholecystitis with abdominal distension and history of hematuria. On examination, she was febrile with tachycardia and a vague abdominal mass of nearly 8*6 cms in left iliac fossa extending to lumbar region. On ultrasound no abdominal collection was documented and her paracentesis was also negative. MRI abdomen and pelvis revealed a large retroperitoneal haematoma of size 11*10 cms and thus was planned for emergency laparotomy. Per operative findings revealed uterus was intact, well contracted, with a glistening layer overstretched on it, which on careful inspection was found to be the posterior surface of bladder and also

the foleys bulb was visible. Anterior bladder wall was found completely deficient and lateral walls were cicatrized. There was a large 7 shaped rent in posterior bladder wall with large retroperitoneal haematoma. Urologist was called. DJ stenting done, haematoma was gradually evacuated (1000cc) keeping a strict watch on vitals. Bladder was reconstructed with dual catheterization. IVP was done at 2 weeks followed by a Cystogram at 4 weeks post surgery which were normal and her urethral catheter was removed. Cystoscopy was performed at 6 weeks in which bladder anatomy was normal and thus DJ stent and SPC was were also removed. Patient is still on regular follow up and is doing well with no urinary complaints, her NCCT KUB done at 5 months post surgery is also within normal limits.

Thus it is very important to keep a high index of suspicion of Retroperitoneal haematoma in gradually deteriorating cases of normal/ operative deliveries especially complicated by hypertensive disorders of pregnancy, obstetric coagulopathies, adherent placenta. Also, existing guidelines need to include RPH as an important cause of maternal collapse and maternal morbidity.

A True Near Miss: Postpartum eclampsia with pres syndrome in pregnancy

Divya, Pratiksha Gupta, Nupur Gupta, Shreya Gautam
Department of Obstetrics and Gynaecology
ESIC Basaidarapur, Delhi

Posterior reversible encephalopathy syndrome is a rare complication generally associated with headache and acute changes in blood pressure. Delay in the diagnosis and treatment may result in death or in irreversible neurological sequelae. We present a case of post partum eclampsia with PRES and sepsis.

A 29 year old Primigravida with 33+4 weeks POG with Severe Preeclampsia with Septicemia with Moderate Anemia and foetal distress was admitted

in ESI Basaidarapur hospital on 18/11/2020 after being referred from ESI NOIDA. Injection MgSO₄ as per Pritchard regime was started and Injection labetalol (20mg+40mg) was given. Patient shifted for emergency LSCS in view of severe preeclampsia with fetal distress. No intra-operative PPH occurred, a live baby girl, weighing 1.25kgs, was delivered on 18/11/20 and shifted to NICU. Intra-operative hypertension managed with IV anti hypertensives and continued in Postoperative period and patient shifted to ICU. She was started on Piptaz and clindamycin in view of Leucocytosis. She had 3 episodes of GTCS on MgSo₄ which aborted spontaneously, IV antiepileptics were started and MgSo₄ maintenance dose was continued. Patient was intubated for airway protection, in view of prolonged post ictal phase and rigorous invasive BP monitoring via right radial arterial line was done. Hypertensive emergency managed with labetalol and NTG infusion titrated according to BP. Patient underwent NCCT Head suggestive of? Infarct? Vasogenic edema in b/l frontal regions (Right>Left), left temporo-parietal lobes showing ?Early PRES changes. Patient started on hyperosmolar agents Inj. Mannitol 100ml iv OD and Inj. Dexamethasone 8 mg iv TDS with medicine consultation. Addressing the pupillary dilation patient underwent a fundoscopic examination which was found to be suggestive of Grade II-III Papilledema with hypertension retinopathic changes. Patient was put on weekly fundoscopy follow up to see for progressive retinal changes. Human albumin started to address the falling total protein levels. Patient was extubated on POD 7 and was maintaining 100% O₂ saturation on 4-5 litres of oxygen by mask. Patient was transfused 2 unit packed red blood cells to correct anaemia. Sensory-motor examination on postop day -7 showed Power: left lower limbs - reduced (3/5), right lower limb- reduced (4/5). The Tone was reduced in bilateral lower limbs and Bulk was Normal. Her Deep tendon reflexes were reduced. Addressing the neurological deficit patient underwent MRI BRAIN which confirmed the diagnosis of PRES syndrome. Patient developed new onset fever spikes and had persistent leucocytosis. Her COVID -19 RTPCR testing- negative. Upgradation of IV antibiotic to vancomycin according to blood culture was done on POD 8 following which a fall in leucocytosis was

seen. Patient dramatically improved after that. Sepsis resolved and Blood pressure normalized. Improvement seen in the power and tone of b/l lower limbs. Review fundoscopic examination showed dramatic improvement with resolution of blurring of vision. Patient was successfully discharged on POD 18 and called for regular follow up. She had full remission at 6 weeks follow up. PRES is reversible after appropriate treatment, which makes it important to recognize and treat the etiology to prevent its progress to irreversible damage.

A Case of Extrahepatic Portal Vein Obstruction in Full Term Pregnancy

Leena Wadhwa, Sanjana N Wadhwa, Jyoti Jaiswal

Obs and Gyne Department

ESIC PGIMSR, Basaidarapur, Delhi

Portal Cavernoma is a rare occurrence in pregnancy. The most common underlying causes are abdominal trauma, pancreatitis, myeloproliferative disorders and hereditary deficiency of anticoagulants (protein C, S and anti-thrombin III). The portal cavernoma is the cavernomatous transformation of the portal vein. The chronic portal vein obstruction leads to the development of myriads of collateral channels to bypass the occlusion. The clinical presentation includes hematemesis due to variceal bleeding, ascites or anaemia, and splenomegaly. The cavernous transformation of the portal vein is easily diagnosed by sonography. We report our case of a 24 year-old, Primigravida 38 weeks of gestation with deranged liver function test referred to tertiary center. She had history of vomiting on off since 16 weeks of gestation. Ultrasound whole abdomen revealed portal cavernoma. Investigations revealed no prothrombotic disorder. She was planned for vaginal delivery with cut short 2nd stage. Vacuum assisted delivery was conducted. In Post natal period both mother and neonate were healthy and discharged.

There are no definitive guidelines for management of portal cavernoma in pregnancy. The present case adds to the literature and emphasizes on the treatment of portal cavernoma in antenatal and postnatal patients.

Proceedings of Virtual AOGD Monthly Clinical Meeting held at ABVIMS & DR RML Hospital New Delhi on 29th January, 2021

Bilateral Large Vulval Elephantiasis

Manmeet Kaur, Neha Pruthi Tandon, Kamna Dutta
Renuka Malik, Bani Sarkar

Mrs. X, 25 years old female, P1L1, resident of a Hatwaria village, Madhubani district, Bihar presented to gynecology OPD of ABVIMS and Dr. RML Hospital on 06th January 2020 with complaint of huge progressively increasing vulval swelling since 3 years. Swelling initially involved the right labia majora and gradually increased to involve the whole vulval region and was associated with dyspareunia and difficulty in walking. She gave history of being treated for pulmonary Koch 10 years back. On examination, there was a nonulcerative, polypoidal growth of around 20 x 14 x 11 cm arising from bilateral labia majora and minora obstructing the vulval cleft. There was no associated lymphadenopathy or limb edema. All the investigations were normal. Microfilaria antigen testing done at night was negative. Patient was given diethylcarbamazine and excision of the lump was done on 14th February 2020. Patient discharged on postoperative day 10 in satisfactory condition. Histopathological report showed dilated lymphatics with non-caseating granulomas, consistent with filariasis.

Discussion: Vulval elephantiasis represents a rare form of localized chronic lymphedema which is irreversible due to permanent damage of lymphatic system. Most common infective cause of genital elephantiasis is filariasis followed by tuberculosis, lymphogranuloma venereum and granuloma inguinale. Other causes are carcinomas, lymph node dissection, genital irradiation and trauma. Filarial elephantiasis of the female genitalia is extremely uncommon accounting for 1-2% of the total cases of filarial elephantiasis. Early diagnosis and treatment of filariasis can eradicate this neglected tropical disease which causes disfigurement and severe morbidity as its sequelae. Surgery is the ultimate treatment option in vulval elephantiasis irrespective of the cause.

Thoracic Endometriosis Syndrome

Alka Goel, Abha Kiran, Ashok Kumar

33-year P1L1 presented with complains of pelvic pain with premenstrual worsening for 7 years and recurrent right sided chest heaviness for 2 years. She was treated for infertility, pain abdomen and ascites twice in past, 6 years and 3 years back with cat 1 ATT and cat 2 ATT respectively, started empirically. She was diagnosed with right hydropneumothorax 6 months back, on an X ray done for breathlessness. Inter coastal drain fluid was a hemorrhagic transudate. CECT showed ground glass opacities in right middle and lower lobes of lung and mild ascites. On thoracoscopy, pleural fluid was blood stained with blebs, adhesion and yellow deposits on pleura. Biopsy from pleura showed hemosiderin laden macrophages. She had history of dysmenorrhea since menarche. She was remarried 9 years back but was unable to conceive. There was decreased air entry on right side of chest with an intercostal drain in situ. Uterus was anteverted, normal size with restricted mobility with tender left adnexa, tender nodularity in pouch of Douglas and thickened and tender bilateral uterosacral. CA 125, Pap smear and endometrial biopsy were normal. On ultrasound abdominal and pelvic organs were normal with increased vascularity with mild ascites. Patient was offered ablation of pleural lesions and medical management for endometriosis followed by IVF Conception but she opted for definitive management—Total abdominal hysterectomy with bilateral salpingo-oophorectomy. On laprotomy, there were extensive adhesions between bowel, abdominal wall and pelvic organs. There was presence of endometrial glands, stroma & hemosiderin laden macrophages in bilateral ovaries on histopathology.

Discussion: Thoracic endometriosis syndrome is presence of endometrial glands and stroma in lung parenchyma, diaphragm, pleura and/or bronchopulmonary segment. Lung parenchyma and

diaphragmatic lesions are mostly asymptomatic. Pleural lesions present commonly as pneumothorax or hemothorax. Bronchopulmonary lesions present with hemoptysis. Gold standard for diagnosis is video assisted thoracoscopic surgery (VATS) which shows discrete lesions such as blebs, scarring, red and blue lesions, fibrosis or diaphragmatic fenestration. As patients are young first line management is medical despite high risk of recurrence on discontinuation. VATS with video laparoscopy or lapotomy is done for refractory or recurrent diseases. Pleurodesis with VATS decreases risk of recurrence. Bilateral salpingo-oophorectomy is definitive management.

Tubocutaneous Fistula

Paridhi Gupta, Anjum Ara, Indu Chawla

A 38 years old female, P3L3 with previous three cesarean deliveries, referred from government hospital UP, with complaints of persistent discharge from left inguinal region since one and half year. The discharge was serous and blood stained during menses. She had history of similar discharge from right inguinal region which resolved after taking ATT 6 months back. Previously she was investigated with ultrasound and CT which showed bilateral TO masses and ATT was started on clinical suspicion. On examination, bilateral cystic masses were present in both adnexa with active discharge from

left inguinal sinus. CECT was suggestive of bilateral pyosalpinx. Right side: 5.6x3.9 cm/left side: 5x4.8 cm. CT sinogram showed irregular linear tract of 9 cm from skin to left adnexa. Specific investigations like HPE, TB-PCR, CBNAAT from discharge, sinus tract and endometrial biopsy were negative for TB and malignancy. Other causes of chronic discharging sinuses were ruled out. On Exploratory lapotomy left side TO mass of 5x5 cm adherent at deep inguinal ring was present and fistulous tract traversed the inguinal canal. Right side TO mass was 3x4 cm size. Total abdominal hysterectomy with resection of bilateral TO masses with excision of fistulous tract was done. HPE was suggestive of granulomatous salpingitis. ATT was started. Left sided sinus healed completely in the follow up visits.

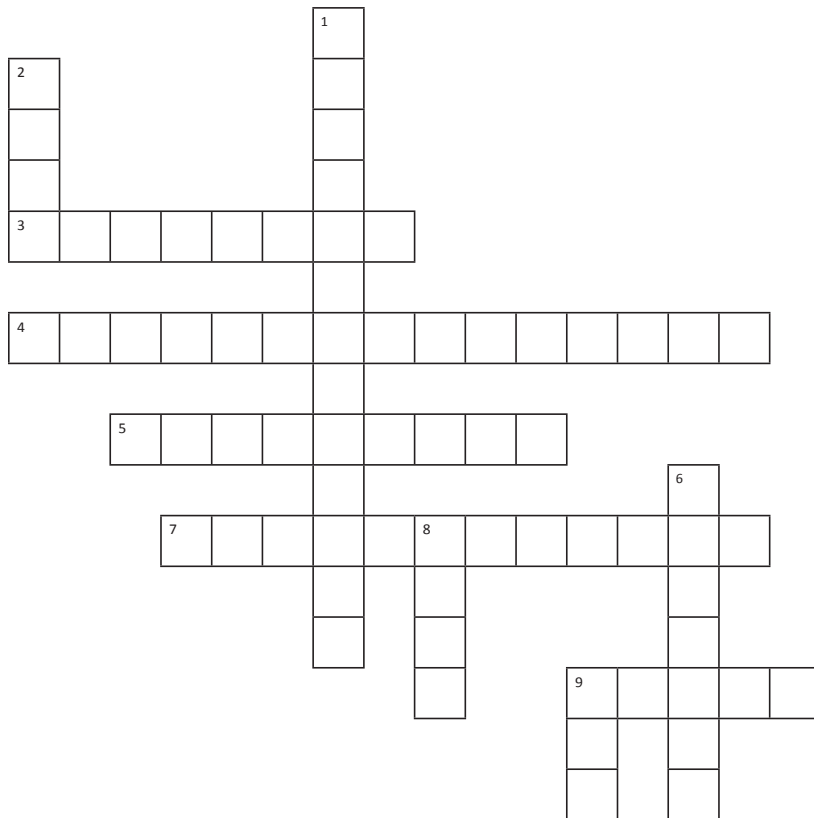
Discussion: Female Genital TB is a chronic disease with low grade symptoms affecting fallopian tubes in almost all (> 90- 95 %) of the cases and involvement is usually bilateral. Its prevalence is underreported due to asymptomatic cases, paucibacillary nature and lack of reliable confirmatory investigation. CT Sinogram is preferred investigation in chronic sinus cases. Excision of fistulous tract with salpingectomy or salpingo-oophorectomy and treating the underline cause is treatment of choice for tubocutaneous fistula.

Cross Word Puzzle

Ruma Satwik

Consultant, Centre of IVF and Human Reproduction, Sir Gangaram Hospital, New Delhi

CROSSWORD



Across

3. In urodynamic studies bladder outlet obstruction can be discerned by a low flow rate, and high vesical -----(8)
4. Potent bladder analgesic (15)
5. Another name for Cooper's ligament. (9)
7. Pressure manometer that measures maximum pelvic strength by vaginal squeeze pressures (12)
9. In women with symptoms of UTI, a minimum concentration of 10 to the power ---- CFU needed to diagnose UTI (5)

Down

1. One pathophysiology of stress urinary incontinence: Urethral -----(13)
2. Method of repair of Complete Perineal tear (4)
6. Oral antibiotic preferred in women > 65 yrs. to treat an acute episode of UTI (7)
8. Urine Culture technique that has higher sensitivity for urogenital pathogens & cultures specimen under various conditions (4)
9. One surgical method to address stress urinary incontinence. (3) (abbreviation)

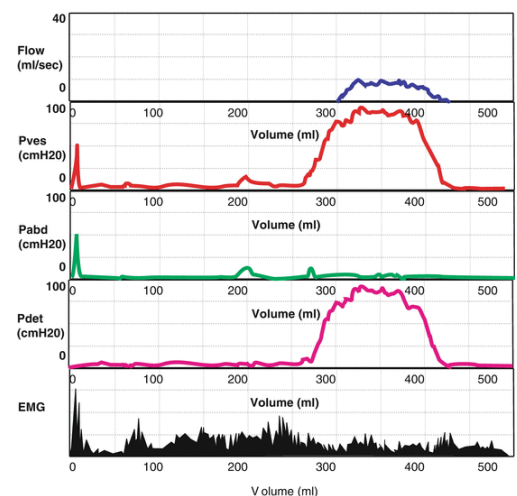
PICTORIAL QUIZ

Geeta Mediratta

Senior Consultant, Sir Ganga Ram Hospital, New Delhi

Questions

- Q 1. Identify what this graph is?
- Q 2. How is the detrusor pressure measured?
- Q 3. What is diagnosis?



Announcement

Calendar of Virtual Monthly Clinical Meetings 2020-21

29 th May, 2020	B L Kapoor Hospital
26 th June, 2020	VMMC & Safdarjung Hospital
31 st July, 2020	AIIMS
14 th August, 2020	Lady Hardinge Medical College & Smt. Sucheta Kriplani Hospital
28 th August, 2020	Army Hospital- Research & Referral
11 th September, 2020	Indraprastha Apollo Hospital
25 th September, 2020	DDU Hospital
27 th November, 2020	MAMC Hospital
18 th December, 2020	Sir Ganga Ram Hospital
1 st January, 2021	ESIC PGIMS Hospital
29 th January, 2021	Dr RML Hospital
26 th February, 2021	UCMS & GTB Hospital
26 th March, 2021	Lady Hardinge Medical College
23 rd April, 2021	Apollo Hospital

Answer: February 2021 Issue

Crossword

Across

3. Pressure 4. Phenazopyridine 5. Pectineal 7. Perineometer 9. Three

Down

1. Hypermobility 2. Flap 6. Septran 8. EQUC 9. TVT

Pictorial Quiz Answers

- A 1. Filling cystometry (Cystometrogram)
- A 2. By the following equation: Pves-Pabd
- A 3. Overactive bladder (Uninhibited detrusor contraction)

AOGD Events Held

On 19th December 2021, a Webinar on **“Pioneering PCOS”** conducted under the aegis of Reproductive Endocrinology Committee AOGD.

On 1st January 2021, a webinar on **“Role of Low Dose Mifipristone in Uterine Leiomyoma & Endocrinologist Perspective in PCOS”** under the aegis of Reproductive Endocrinology Committee AOGD.

On 4th January 2021, a Webinar on **“An Update on Vulvovaginal Health”** was held under the banner of AOGD Endoscopy Committee.

On 5th January 2021, a Webinar on **“Understanding & Treating Adenomyosis”** was held under the banner of AOGD Endoscopy Committee and Multidisciplinary Committee.

On 6th January 2021, a Webinar on **“Critical Nutrition in Pregnancy and Pearl’s Wisdom - How to stay healthy and happy in 2021”** was held under the aegis of AOGD

On 9th January 2021, a Webinar on **“Role of Low Dose Mifipristone in Uterine Leiomyoma” & “Endocrinologist Perspective in PCOS”** held under the aegis of Reproductive Endocrinology Committee AOGD.

On 14th January 2021, a Webinar **“FAQ on Endometriosis”** was held under the aegis of AOGD.

On 15th January 2021, a Webinar **“FAQ on AUB”** was held under the aegis of AOGD.

On 16th January 2021, a Webinar **“FAQ on Breast Cancer”** conducted under the aegis of AOGD.

On 17th January 2021 a Webinar on **“Thin Endometrium where are we today?”** and **“Management of Threatened Miscarriage”** was held under the aegis of AOGD Infertility Committee.

On 18th January 2021, a Webinar **“FAQ on Small Babies”** was held under the aegis of AOGD.

On 22nd January 2021, a Webinar on **“Medical Management of Endometriosis. Which drug is better?” & “Myoinositol in PCOS”** was held under the aegis of AOGD Infertility Committee & AOGD Endometriosis Committee.

On 23rd January 2021, CME on **“Cervical Cancer Prevention”** was held under the aegis of AOGD.

On 25th January 2021 a Webinar on **“Prevention of Cervical Cancer & Breast Cancer”** conducted by FOGSsd was held under the aegis on AOGD, NARCHI-Delhi, FOGSI, ISCCP & Onco Committee of AOGD.

On 25th January 2021 a Webinar on **“Oncology”** was held under the aegis of AOGD.

On 29th January 2021, a Webinar on **“Urogynaecology Mastert Class”** was held under the aegis of AOGD.

On 30th January 2021, a Webinar on **“How to Approach a Care of Breast Lump and Which Ones are to be sent to Oncologist”, “Screening for Cervical Cancer and Understanding Anaemia”** was held under the aegis of AOGD BCCASPC.

On 1st February 2021, a Webinar **“FAQ on GDM”** was held under the aegis of AOGD.

On 2nd February 2021, a Webinar on **“Recurrent Hydrops Fetalis”** was held under the banner of fetal Medicine & Safe Motherhood Subcommittee of AOGD.

On 5th, 6th & 7th February 2021, a **“Gurukul Classes”** was held under the aegis of AOGD & ISOPRB.

On 9th February 2021 a Webinar **“FAQ on Menopausal Medicine”** was held under the aegis of AOGD.

Forthcoming Events

On 17th February 2021, a Webinar **“FAQ on Uterine Fibroid”** will be held under the aegis of AOGD.

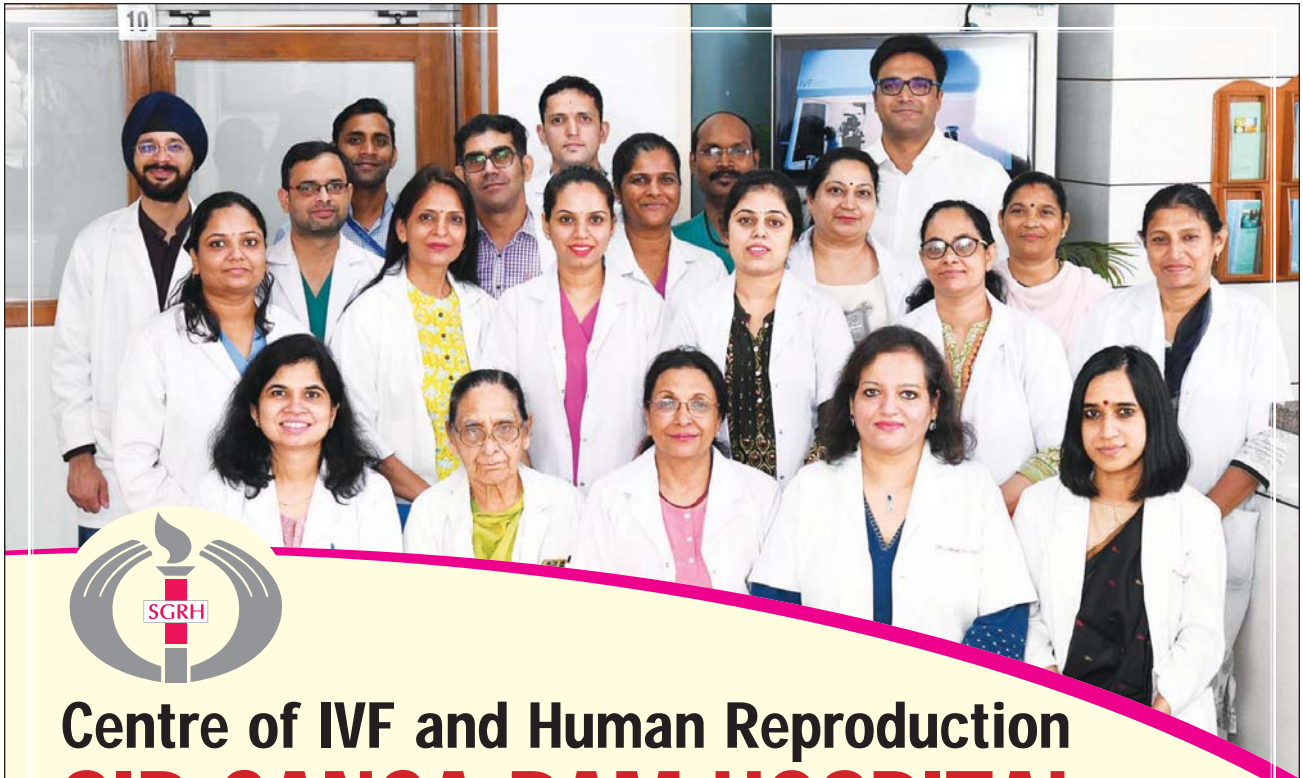
On 18th February 2021, **“AOGD Executive Committee Meeting”** will be held at Sir Ganga Ram Hospital, Auditorium

On 25th February 2021 **“FAQ on Cervical Cancer”** will be held under the aegis of AOGD.

On 26th February 2021, **“AOGD Monthly Meeting”** was organized by University College of Medical Sciences and Guru Teg Bahadur Hospital, New Delhi

On 27th February 2021 CME on **“Women's Health”** will be under the aegis of AOGD.

On 2nd March 2021 FAQ on **“Ovulation Induction”** will be held under the aegis of AOGD.



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appointment call us at
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For
IVF appointments or
queries call us at
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