

Role of urodynamics before prolapse surgery

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Abstract The role of urodynamic studies (UDS) before prolapse surgery is contentious and a hotly debated topic in urogynaecology. Previous studies in women with prolapse and women with uncomplicated stress urinary incontinence (SUI) have focused on women without preoperative incontinence. Currently, it has not been possible to reach a universal consensus on the role of UDS before prolapse surgery in women with concomitant symptomatic or occult SUI. It is clear that UDS could add some information in women undergoing pelvic organ prolapse surgery and could facilitate counselling of patients. However, there is no evidence that the outcome of surgery is altered by prior UDS. New well-designed randomized studies are necessary to improve our understanding of this topic.

Keywords Pelvic organ prolapse · Stress urinary incontinence · Surgery · Urodynamics

Introduction

The role of urodynamic studies (UDS) before prolapse surgery is contentious and a hotly debated topic in urogynaecology.

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Case vignette

A patient with pelvic organ prolapse (POP) stage IIIa, IIc, Ip (according to the POP-Q system), symptomatic for vaginal bulging and asymptomatic for stress or urgency incontinence, was scheduled for surgical repair in our urogynaecology unit.

For urodynamics (preoperative UDS should be performed)

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POP and lower urinary tract symptoms (LUTS) often co-exist as they may have a similar underlying pathophysiology. Up to 96 % of women with POP report LUTS with mixed urinary incontinence predominating [1]. However, even the implementation of powerful and sophisticated instruments, such as artificial neural networks or multiple linear regression, does not permit an accurate diagnosis of the lower urinary tract dysfunction based on symptoms and pelvic examination findings [2]. UDS involve objective assessment of the function and dysfunction of the urinary tract by any appropriate method [3]. As surgical correction of POP may alter LUTS [4], international professional bodies recommend the performance of preoperative UDS [5].

Before undertaking these, clinicians should consider what is the urodynamic question to be answered and how is it going to change the patient’s management. UDS may help decision making regarding combined stress incontinence surgery in women with coexisting stress urinary incontinence (SUI) or in those without SUI. Certain urodynamic variables may identify patients at risk of persistence or development of postoperative urgency/urgency incontinence and voiding dysfunction (VD). This could help patients accurately assess the risks and benefits of surgery and facilitate optimal preoperative counselling directed towards appropriate patient

expectations as well as guide proactive management of postoperative symptoms.

Stress urinary incontinence

A number of well-designed randomized controlled trials have shown that concomitant continence surgery reduces the risk of postoperative de novo SUI in women without SUI who are undergoing POP surgery [6, 7]. However, combination surgery is associated with an increased rate of adverse events [8] (major bleeding complications, bladder perforation, prolonged catheterization, urinary tract infections) and higher cost. As the benefits of combined surgery should outweigh its risks, careful patient selection is of paramount importance. While the number needed to treat (NNT) to prevent one woman developing de novo SUI is nine among all continent women, it is only three among continent women with occult SUI [8].

Preoperative UDS with reduction of prolapse can tailor the decision to perform a concomitant continence operation as several studies have shown negative predictive values for postoperative SUI of more than 90 % [9]. We believe that invasive UDS provides more information than a prolapse reduction provocative stress test. In our opinion, when preoperative UDS are suggestive of low bladder compliance, detrusor overactivity (DO) or detrusor underactivity (DU) an interval rather than a concomitant continence procedure is advisable even in women with occult SUI.

The performance of combination surgery is less debatable for POP with coexisting SUI (NNT 2) [8]. Women with POP diagnosed with urodynamic stress incontinence and normal bladder compliance without DO or DU are good candidates for concomitant stress-incontinence surgery. Regarding the type of continence surgery, we could use guidance from studies comparing different midurethral tapes without excluding concomitant POP surgery. A retropubic tape appears to be more suitable than a transobturator tape in women with intrinsic sphincter deficiency, diagnosed using urethral pressure profilometry and/or Valsalva leak point pressures [10]. As the placement of the retropubic tape is closer to perpendicular to the urethral axis, it creates greater circumferential compression of the urethra and provides better support.

Urgency/urgency incontinence and voiding dysfunction

UDS may also identify patients at risk of persistence or development of postoperative urgency/urgency incontinence and voiding VD. These symptoms are associated with poor patient satisfaction as the majority of the patients expect complete postoperative resolution of all their LUTS. The presence of preoperative DO [11] has been identified as a predictive factor for persistent urgency and urgency incontinence after POP surgery. Other recognized predictive factors are higher voiding pressure at maximal flow ($P_{det}Q_{max}$) [12]

and higher bladder outlet obstruction index, calculated as $P_{det}Q_{max} - 2Q_{max}$ [13]. Thus, urodynamic information can facilitate tailored counselling of patients regarding the need for postoperative treatment for urgency/urgency incontinence such as antimuscarinic agents.

Preoperative poor detrusor contractility is associated with postoperative VD [11]. Identifying patients likely to develop postoperative VD may be useful in helping to accurately shape patient expectations and identify those most likely to benefit from preoperative teaching of clean intermittent self-catheterization (CISC) or insertion of a suprapubic catheter at the time of surgery if they cannot perform CISC.

Discussion

UDS are a series of objective tests which improve our understanding of LUTS and their interaction with POP. Therefore, whilst they would not be expected to improve the outcome of POP surgery, they offer valuable information to the surgeon that could potentially improve decision-making and overall patient management. However, surgeons should tailor their preoperative work-up to their surgical expertise, as certain techniques for repair of anterior compartment prolapse may have a curative effect on SUI and native tissue repairs are less likely to lead to postoperative SUI compared to transvaginal mesh surgery [14].

Physicians should also consider whether the urodynamic information would affect their management plan, especially if they have strong views about performing or not performing combination surgery irrespective of the investigations' findings. Urodynamic data could also help patients accurately assess the risks and benefits of surgery and facilitate optimal preoperative counselling directed towards appropriate patient expectations as well as guide proactive management of postoperative symptoms. Despite the lack of robust evidence, there is a clear role for UDS before POP surgery. Further well-designed studies are required to assess their clinical value, cost-effectiveness and patient preference.

Against urodynamics (preoperative UDS should not be performed)

Dr. Maurizio Serati, Dr. Michele Meschia

The reliability and clinical impact of UDS remain one of the most debated issues in urogynaecology. The available literature is focused on the role of UDS in the surgical treatment of SUI in women. The data on the use of UDS in patients with uncomplicated and pure SUI are conflicting and heterogeneous [15–22]. Very few data exist on the role of UDS in the preoperative evaluation of women with POP. The latest recommendations of the International Consultation on Incontinence for the management of POP suggest only selective use of UDS

when the results would alter the planned treatment [23]. In fact, the question is whether and how UDS can really change the choice of surgery and its outcome in women with POP.

Stress incontinence

In 2000, Weber and Walters developed decision-analytic models to evaluate the cost-effectiveness of basic office evaluation before surgery in women with prolapse and SUI symptoms and contrasted it with that of UDS. They demonstrated that UDS before surgery in women with prolapse and SUI symptoms does not improve cure rates and is not cost-effective relative to basic office evaluation [24].

The recent Outcomes Following Vaginal Prolapse Repair and Midurethral Sling (OPUS) trial compared anterior vaginal prolapse repair with or without a concurrent tension-free vaginal tape (TVT) sling procedure in stress continent women [6]. At 12 months, urinary incontinence (allowing for subsequent treatment of incontinence) was present in 27.3 % and 43.0 % of patients in the sling and sham groups, respectively ($P = 0.002$). It is important to underline that the de novo incontinence rate was very high in both groups, although only women without symptoms of SUI were included. The rate of bladder perforation was higher in the sling group (6.7 % vs. 0 %), as were rates of urinary tract infection (31.0 % vs. 18.3 %), major bleeding complications (3.1 % vs. 0 %), and VD (3.7 % vs. 0 %). The authors estimated that in this asymptomatic female population, at 12 months, 6.3 prophylactic slings would have to be inserted to prevent one woman from becoming stress incontinent after prolapse repair. In conclusion, the authors stated that, if SUI has been documented in a woman preoperatively, then it is possible that the benefits of a concomitant sling will outweigh the risks; if not, the risk–benefit ratio is less predictable [6].

The authors who are in favour of UDS in women with POP often claim that this evaluation in women without symptoms of SUI enables the demonstration of occult stress incontinence and possibly its treatment. However, this has not been well-demonstrated and, moreover, the best way to unmask the occult SUI during UDS is not standardized and universally accepted.

In 2007, Roovers and Oelke reviewed the impact of UDS in the diagnostic work-up of patients undergoing surgical correction of genital prolapse [25]. They stated that occult SUI is diagnosed in about 50 % of patients with genital prolapse not reporting stress incontinence before surgery. However, the authors underlined that it is unknown which barrier test is preferred to assess the presence of occult urodynamic stress incontinence. In addition, it is unknown whether occult SUI can be equally effectively diagnosed by non-urodynamic tests such as a pessary test or a Sims' speculum. Roovers and Oelke also found that the combination of prolapse and stress incontinence surgery not only has the advantage of attempting to solve two problems at

the same time, but also carries an increased risk of unwanted side effects, of which VD and DO are the most important [25].

The most recent randomized trial on this topic enrolled 80 patients with POP and occult SUI who were randomly assigned to prolapse surgery alone without a sling or prolapse surgery with concurrent TVT. After 24 months, the authors observed similar subjective and objective outcomes in the two groups and they concluded that these results support a policy that routine insertion of a sling in women with occult SUI at the time of prolapse repair is questionable and should be subject to shared decision-making between clinician and patient [26].

A recently published systematic review included seven randomized trials to evaluate prolapse surgery with or without incontinence surgery in women with POP [8]. The authors considered studies that included women without urinary symptoms and studies that included women with occult SUI. Interestingly, this meta-analysis showed that in asymptomatic women, combination surgery resulted in a lower incidence of de novo subjective SUI and the need for subsequent anti-incontinence surgery; however, the rates of de novo objective SUI were similar in the group of women undergoing incontinence surgery and the group without anti-incontinence surgery. In the subgroup of women with occult SUI, there was a lower incidence of objective SUI after combination surgery but with a higher rate of adverse events and a higher rate of prolonged catheterization.

It seems evident that even if UDS could diagnose occult SUI using validated and standardized methods (which is not the case at this time), there would be no scientific evidence that it is always appropriate and convenient to associate the two surgical procedures. Therefore, the UDS diagnosis would still not be able to change with absolute certainty the surgical choice.

Urgency/urgency incontinence and voiding dysfunction

Another argument put forward by supporters of UDS is that these tests can predict the persistence of symptoms of overactive bladder (OAB). However, a significantly reduced cure rate with antimuscarinics in women with OAB and concomitant anterior vaginal wall descent has been demonstrated [27]. Furthermore, Nguyen et al. found that in approximately two-thirds of women with POP and concomitant symptomatic DO there is resolution of DO after prolapse repair [28].

Discussion

In conclusion, it is possible that UDS could better identify and define some urinary dysfunctions, such as a preoperative DO or a occult SUI, but this information rarely leads to a change in the management plan or the type of surgical procedure. Moreover, at present, we have no data to show that the UDS can improve subjective or objective outcomes of surgery for prolapse. Surgical correction of prolapse can improve not only the symptom of vaginal bulging but also the symptoms of OAB

and could cure the concomitant SUI. UDS should be reserved only for selected patients with genital prolapse when the results would alter the planned treatment.

Summary

Currently, it is not possible to reach a universal consensus on the role of UDS before prolapse surgery. It is clear that UDS could add some information in women undergoing POP surgery and could facilitate counselling of patients. However, there is no evidence to show that the outcome of surgery is altered by prior UDS. New well-designed randomized studies are necessary to improve our understanding of this topic. Several decades ago, one of the most brilliant and influential intellectuals in human history, Albert Einstein, stated that “The search for truth is more precious than its possession”, and this is true even in this scenario.

Conflicts of interest I. Giarenis – Travel expenses: Astellas, Ethicon, Pfizer

L. Cardozo – Consultant: Allergan, AMS, Astellas, Pfizer; Speaker honorarium: Allergan, Astellas; Trial participation: Pfizer

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