ISC in women following urogynaecologic surgery

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Original citation:
Bardsley, A. (2015) ISC in women following urogynaecologic surgery. British Journal of Nursing, volume 24 : S6-S13. DOI: 10.12968/bjon.2015.24.Sup18.S6

http://dx.doi.org/10.12968/bjon.2015.24.Sup18.S6

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The use of Intermittent Female self-catheterisation following urogynecologic surgery in acute trusts

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Abstract

Urinary retention is a common problem for women following surgery and a significant complication for those who have undergone urogynecologic surgery with prevalence estimated between 2.5% and 24% (Dorflinger and Monga, 2001). Post-operative urinary retention (POUR) can lead to bladder distention, causing altered bladder function, urinary tract infections and poor surgical outcomes. Intermittent self-catheterisation (ISC) for women is generally considered in preference to in-dwelling catheterisation wherever possible. This article aims to explore the role of ISC for women following surgery.

Introduction

Urinary retention is a common post-operative complication in women following urogynecologic surgery with prevalence estimated between 2.5% and 24% (Buchko and Robinson, 2012 and Dorflinger and Monga, 2001) and as high as 43% after tension-free transvaginal mesh (TVT) sling placement (Partoll, 2002). Prevalence rates that include transient voiding dysfunction documented in the recovery room range between 39% and 84% (Geller et al, 2007). Although prolonged retention (lasting longer than 4 weeks post-operative) is rarer, the rates for TVT slings are around 2%-4% (Natale et al, 2009). The rates of retention reported following transurethral injection of bulking agents such as collagen are around 15% with a low risk of prolonged retention ((National Institute for Health and Clinical Excellence (NICE) , 2013 and Stothers, Goldenberg and Leone, 1998). The rate of retention following surgery to repair vaginal prolapse, without incontinence procedures is estimated at 29% (Hakvoort, 2009), however, in practice, women will undergo a combination of procedures aimed at treating both prolapse and incontinence, which increases their rsik of developing post-operative retention (Geller, 2014).

Post-operative urinary retention (POUR) can lead to bladder distention, causing altered bladder function, urinary tract infections and poor surgical outcomes (Buchko and Robinson, 2012, Kemp, 2002 and Rosseland., Stubhaug and Breivik, 2002). There are a number of factors identified as

predisposing a patient to urinary retention, including age, previous history of voiding problems, type and duration of surgery, some medications and type of aneasthesia (Baldini et al, 2009 and Ringdal., Borg and Hellstrom, 2003).

Intermittent self-catheterisation (ISC) is generally accepted as the first line choice for women with bladder dysfunction that affects the ability to empty their bladder either fully or at all (NICE, 2013, Royal College of Nursing (RCN) Continence Forum Committee, 2012).

Urinary retention

An adult bladdder has a capacity between 400-600mls, with healthy women experiencing a first need to void at a volume around 150mls and a first urge at 300mls (Abrams et al, 2010 and Mahfouz et al, 2012). Voiding occures when the bladder wall is stretched, activating receptors, which send afferent nerve signals via the spinal cord to the cerbral cortex. If the timing is appropriate to void, the cortex will send an efferent nerve signal to the pontine micturition centre, which activates parasympathetic motor neurons leading to detrusor contraction. At the same time the pontine micturition centre inhibits the somatic efferent motor neurons in the pelivc floor and urethral tissue leading to urethral sphincter relaxation (Geller, 2014). Surgery can lead to oedema, inflammation and damage to the peripheral nerves, which along with postoperative pain and discomfort can affect bladder filling sensation and the voiding nerve pathway resulting in POUR (Baldini et al, 2009). Voiding is considered abnormal when an individual does not experience any urge at these volumes. A patient is considered in urinary retention when they are unable to empty the bladder or empty sufficiently (Buchko and Robinson, 2012). Normally once the bladder empties, a small amount of urine will remain (less than 75mls) this is called a post-void residual (PVR) (Newman and Wilson, 2011). A post void residual urine is the measurement of urine remaining in the bladder less than 20 minutes after voiding (Buchko and Robinson, 2012). Although there is no standard definition, POUR has been defined as 100mls, however cut off values vary between clinicians (Geller, 2014 and Kaplan et al, 2008). Urinary retention can be either acute or chronic.

Acute urinary retention is a sudden inability to pass urine, which can lead to symptoms of suprapubic pain (Basson., van der Walt and Heyns, 2012). However many patients do not experience symptoms postoperatively due to co-committent use fo spinal anaesthesia and opioid analgesia.The International Continence Society define chronic retention as a non-painful bladder that is palpable following voiding (Abrams et al, 2010). Chronic urinary retention is described as a persistent inability to completely empty the bladder, whilst maintianing the ability to void, which results in an elevated post-void residual urine volume (Abrams et al, 2010). Chronic retention develops slowly and often presents with symptoms of urinary frequency, urgency, nocturia and dribbling or overflow incontinence, and is typically painless (Basson., van der Walt and Heyns, 2012). Research studies have used volumes greated than 300mls to define chronic retention, wheras others use 100mls, 400mls and 500mls (Kaplan et al, 2008). A percentage volume has also been used by practitioners where less than one-half to one-third of total volume. Thus is a patient's bladder is filled to 300mls, and voids 200mls the PVR would be 100mls and this would be considered successful voiding (Geller, 2014). However this method is considered less reliable. In practice a significant residual urine may be one which causes symptoms such as urgency, frequency, suprapubic pain and recurrent urinary tract infections. Also it is important to assess normal bladder capacity for each patient, as for a patient with a 100ml bladder capacity a 50ml residual urine would be significant, where for a patient with a 600ml capacity, this may not present any problems.

Identification of POUR

All patients undergoing urogynecologic surgery should have an assessment of voiding function using urodynamics prior to surgery (NICE, 2013 and Geller, 2014). Pre-operative risk factors include older age, neurological disease, use of anticholinergic medication and a diagnosis of diabetes mellitus (Dreijer., Moller and Bartholdy, 2011). Surgical factors that increase the risk of POUR include, the use of peri and post operative medications including alpha blockers and beta-blockers, analegsics (in particular opioids), sedatives such as midazolam, spinal anaesthetics and spinal analgesics (Baldini et al, 2009).

Following urogynecologic surgery an accurate input and output fluid balance chart should be maintained (NICE, 2007 and Scales and Pilsworth, 2008). If urine output is less than 2mls/kg over 4 hours or 0.5mls/kg/hr the doctor should be notified as this may indicate voiding dysfunction (NICE, 2007 and Scales and Pilsworth, 2008). Although abdominal examination/palpation can detect a significantly enlarged bladder of 300mls or more (Hilton and Stanton, 1981), the use of a portable ultrasound bladder scanner is considered a more accurate, reliable and less invasive method of accurately determining residual volumes and should be used in preference to catheterisation where available (NICE, 2013 and Teng, 2005).

An assessment of voiding function postoperatively involves a voiding trial. The patients bladder should contain at least 300mls prior to voiding (this can be checked with a bladder scanner), the patient is then encouraged to void and the voided volume measured. The pateint is then re-scanned to check for any residual urine (Geller, 2014 and Al-Shaikh et al, 2009). If the bladder volume is too low (i.e. less than 300mls) this can lead to a false-negative result where the patient voids small volumes of urine in the recovery room and is discharged without further intervention. On discharge she can develop large bladder volumes due to hyposensitivity and is then unable to void successfully at higher volumes (Geller, 2014).

Management of POUR

The goal of management is to maintain the bladder in a decompressed state to avoid long term damage. Immediate catheterisation therefore is the first step, and can be performed using either an indwelling or intermittent catheter. Although insertion of an indwelling catheter is often considered easier, there are disadvantages to prolonged catheterisation. Indwelling catheters lead to increased rates of urinary tract infections when compared with intermittent catheterisation, and can lead to urethral trauma as well as causing urethral discomfort and pain. Indwelling catheters can also impede early mobilisation post-operatively. The National Clinical Guideline Centre UK (2012) recommend removal of all transurethral catheters by 2 days postoperatively unless otherwise clinically indicated for healing the surgical wound site.

Another option for prolonged bladder drainage is a suprapubic catheter. This type of catheter is usually placed during surgery, for those procedures that are more likely to cause POUR. A suprapubic catheter has advantages over transurethral catheterisation, including lower UTI rates, greater patient comfort and the ability to trial voiding without removing the catheter (Healy et al, 2012). However there is an increased risk of complications with a suprapubic catheter which include bowel perforation (Cundiff and Bent, 1995).

In a randomised control trial of in-out catheterisation versus indwelling catheterisation, Lau and Lam (2004) concluded that POUR should be managed by in-out catheterisation. Intermittent catheterisation has been demonstrated to lead to a faster resolution of POUR compared with indwelling catheterisation, possibly due to ISC enabling PVR to be measured as an indication of return of normal bladder function (Hakvoort et al, 2011). Where a women is able to perform ISC

independently, IC provides the opportunity to promote independence, self- management and preserve intimacy and dignity (NICE, 2013, NICE, 2010 and Nazarko, 2012).

Advantages of ISC

Intermittent self-catheterisation offers a number of advantages for women including:

- Improved self- care and independence
- Potential complications of ISC
- Reduced risk of common complications associated with indwelling catheterisation
- Reduced need for equipment
- Potential reduction of lower urinary tract symptoms such as frequency, urgency

Complications and contra-indications of ISC

Contra-indications for ISC are few, with patients who have a high intravesical (bladder/detrusor) pressure being an absolute contra-indication, due to potential renal reflux (Vahr et al, 2013). In practice these patients would usually be considered unfit for gynecologic incontinence surgery such as TVT or prolapse repair due to this.

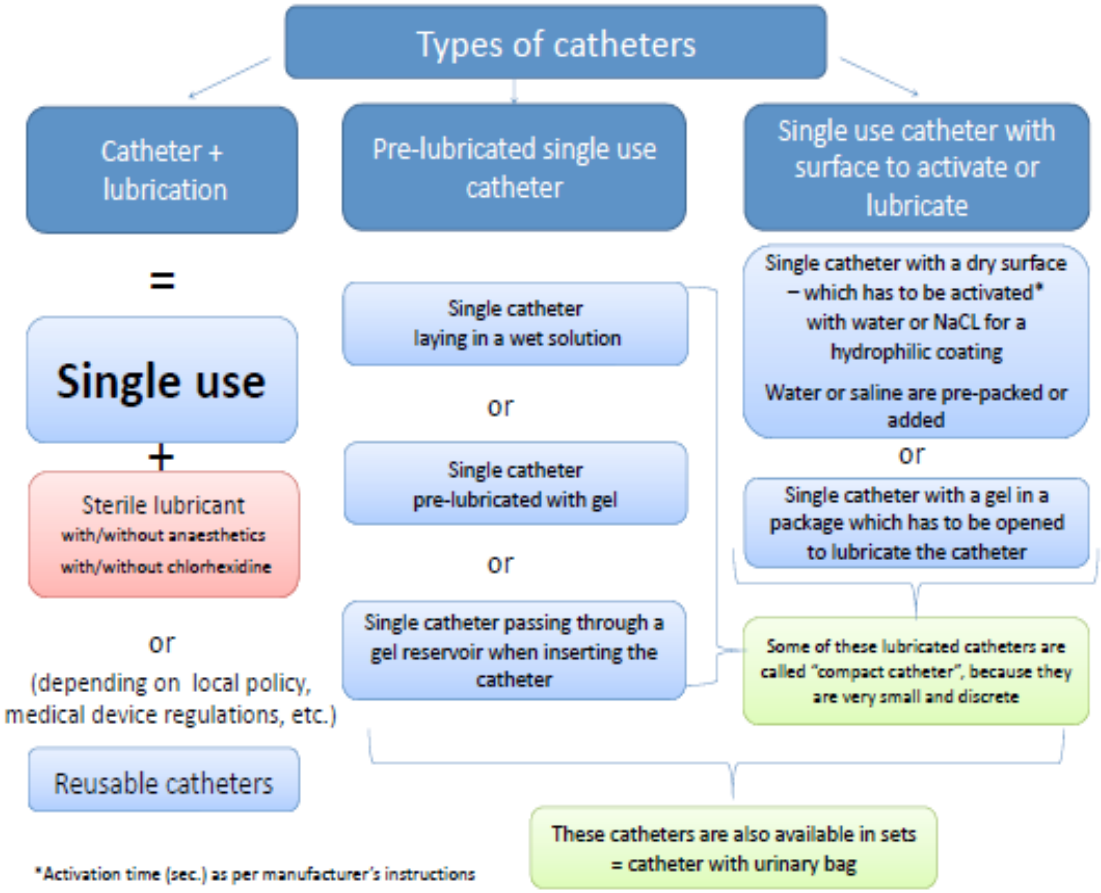
Complications of ISC in short term acute use include UTI's, urethral bleeding, pain and urethritis (Vahr et al, 2013). Urethral bleeding is common when women are learning the technique, persistent bleeding can indicate a UTI or urethral trauma (Igawa., Wyndaele and Nishizwa, 2008) Urethral trauma can result from using unlubricated catheters or the use of force when catheterising which leads to urethral spasm (Wyndaele and Maes, 1990, Perrouin-Verbe et al, 1995, Vapnek., Maynard and Kim, 2003 and Elvy and Colville, 2009). Trauma to the urethra can compromise the urethral mucosa barrier, increasing the risk of infection (Elvy and Colville, 2009). The use of hydrophillic coated catheters can reduce the risk of haematuria and lubrication (either incorporated into the catheter or externally applied) can reduce urethral trauma (Stensballe et al, 2005 and Vapnek., Maynard and Kim, 2003).

Women can experience pain on catheter insertion and removal, often caused by bladder spasm or related to a UTI. In women pain can also be related to incomplete relaxation of the pelvic floor muscle or muscualr atrophy. When catheter removal is painful, this can be due to suctioning pulls the bladder wall into the cathether eyelets, this can be prevented by removing the catheter more slowly (Newman and Wilson, 2011).

Choosing a catheter

The main aspects from a patient's perspective are comfort, ease of use, privacy and dignity and maintenance of independence where possible. Nelaton is the generic term to describe ISC catheters. Nelaton catheters fall into three main categories: hydrophilic, pre-lubricated and uncoated (usually reusable). Figure 3 shows the different types of ISC catheters available.

Figure 3



(Vahr, 2013).

The use of hydrophilic coated catheters has been demonstrated to reduce the incidence of UTI's and haematuria (Li et al, 2013). There is inadequate evidence to assume that the incidence of UTI in ISC is influenced by the use of sterile single use or coated catheters when compared with clean resuable catheters (Getliffe et al, 2007 and NICE, 2012). The lubrication gel on catheters (either separate or pre-lubricated) aims to reduce friction and therefore protect the urethral mucosa (Spinu et al, 2012). NICE (2012) guidance states that patients should be offered a choice of either single use hydrophilic or gel reservoir catheters. If urethral trauma and discomfort postoperatively is an issue, alternative catheter design or materials to ease passage should be considered (Newman and Wilson, 2011). The smallest size of catheter must be used (10-12fg for females) in order to reduce urethral trauma. Although antibacterial and silver –coated alloy indwelling catheters have been demonstrated to reduce UTI rates in short term catheterisation, their effectiveness in catheters used for ISC is as yet unproven (Wyndeale et al, 2012). In acute settings, a single use sterile catheter should always be used.

Performing ISC

Intermittent catheterisation (in/out) is defined as the drainage of the bladder with subsequent removal of the catheter (Abrams et al, 2002). Depending on who performs the catheterisation it will be a clean or aseptic technique. Within an acute setting an aseptic technique is required if a healthcare professional is undertaking the procedure and involves using a sterile single use catheter, sterile gloves and a sterile lubricant gel (if the catheter is not pre-lubricated) (Vahr et al, 2013). The

effectiveness of urethral cleansing prior to ISC in order to reduce contamination remains debatable, however there is evidence to suggest that general genital hygiene using water is sufficient (Cunha et al, 2013). If the women can be taught to undertake the procedure then a clean technique is used, which generally does not require sterile gloves (Seth., Haslam and Panicker, 2014).

When assessing for ISC, the patient's wishes should be taken into account, their motivation and dexterity to perform the technique independently.

Good patient education is essential and will empower the patient and enable them to be as independent as possible. Education around the technique and must be followed up with written or visual information. ISC catheter manufacturer produce some excellent patient education material, including leaflets and DVD's, which can be accessed for free. If a patient is to be discharged home undertaking ISC it is essential that they are followed up, so a referral to the local continence advisory service or district nursing team must be made.

Women should be educated about the correct fluid intake, around 2.5 litres should be encouraged, (Newman and Wilson, 2011). Good personal hygine should be encouraged, however water is prefered as perfumed soaps etc can cause urethral and perineal irritation (Nasiriani et al, 2009). Although washing the genital area prior to each catheterisation is not required, some women prefer to use a "wet-wipe" to ensure cleanliness after a bowel movement, to prevent UTI's. It is preferable to perform ISC prior to a bowel movement to minimise E. coli contamination of the urethra. Perineal hygiene is also recommended after intercourse and spermicidal lubricating agents should be avoided as they may lower the natural flora in the urethra.

Prophylactic antibiotics have been found to have no benefit in reducing infection rates for women performing ISC and should be avoided due to the growth in resistant micro-organisms (NICE, 2012, (Niel-Weise., van den Broek and da Silva, 2005 and Wyndeale et al, 2012)

ISC regime

If a women is unable to empty their bladder at all, an ISC regime of 4-6 times a day is required (Nazarko, 2012). Where a women is able to void, the residual urine determines the ISC regime, ofetn 1-3 times a day (Shekelle et al, 1999 and Sauewein, 2002). The table below illustrates the frequency of ICS required (Naish, 2003).

Table 1 – Frequency of intermittent catheterisation (Naish, 2003)

Residual bladder volumes	Frequency
Unable to void	On average 4-5, possibly 6 times a day (depending on incontinence symptoms)
Over 500mls	More than three times daily
Between 300-500mls	2-3 times daily
Between 150-300mls	1-2 times daily
Less than 150mls	Daily
Less than 100mls on three consecutive occasions	Stop and re-assess residual urine levels – may need to undertake ISC as little as once a week.

Conclusion

Urinary retention is a common problem for women undergoing urognecologic surgery. ISC is the preferred method for bladder emptying in women with post-operative urinary retention (POUR). Healthcare professionals should be aware of current guidelines and evidence based practice to educate women about the risk of infection and how to avoid symptomatic UTI's when starting to learn the technique. Healthcare professionals should offer ISC as an option to post-operative women in order to preserve bladder function and promote self-care, independence and dignity within the acute setting.

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