

AUDIT ON METHOD OF MALE URETHRAL CATHETERIZATION AND ITS MANAGEMENT IN A TERTIARY CARE CENTRE, OF SOUTH INDIA

Vivek Harihar¹, Ratkal Chandrashekar², Mohan Kumar³ and Girish.H⁴

Abstract

Aim and Objective; To evaluate the standard and safe catheterization method among the both male and female nurses , house surgeons and residents of R.L.J.Hospital.

Materials and Methods; Both male and female nurses , house surgeons and residents of R.L.J.Hospital are made to record their technique of male catheterization, in a standard proforma prepared for this study , which will be then compared with the standard and safe catheterization technique and results obtained will be analysed in terms of percentage.

Results ; Study includes a total number of 250 participants out of which 100 participants were house surgeons (HS), 100 participants were trained nurses (N) and 50 were Post graduate residents (PG).

Out of 250 participants, 227 participants has the practice of using sterile gloves. 57,78 and 12 participants does not know to choose appropriate catheter type and size for a given particular case in HS, N and PG group respectively. 28,51 and 9 participants from HS, N and PG group respectively does not know the standard and safe method of catheterization. 42,67 and 26 participants from HS, N and PG group respectively does not know post catheterization management like securing the catheter, catheter care, how often to change catheter in a chronic bed ridden patients and also unaware about the complications of catheterization.

Discussion;

Authors suggest following panacea to raise the standard of male urethral catheterization.

1. Nurses: In the study 75% of the nurses were unable to choose the appropriate size for a given particular patient for which they have to be educated regarding various urethral catheters with their sizes. 37% of nurses are unaware of the urethral catheterisation but it is the nurses who undertake the majority of catheterisations in primary care and hence they should be educated about the indications and as well as the contra-indications of the procedure.
2. House-surgeons: Though House-surgeons will be the first line of contact to the patients in most of medical college hospitals and tertiary care centres, they should be thought to handle difficult catheterisation procedure like in case of prostatomegaly and pelvic injuries to choose the appropriate size and type of catheter for a given particular patients. Since majority of House-surgeons (88%) were aware about the anatomy of the male urethra in our study the more emphasis should be given to the practical aspects.
3. Post-graduate residents: A clinical post graduate should always be aware of the indications, contraindication and complication associated with the catheterisation. In case of catheterisation failure or acute urinary retention secondary to stricture, BXO and etc, post graduates should be able to perform supra pubic cystostomy. It must be recommended that surgical post graduates should have a compulsory urology posting during their Master degree course.

Conclusion ; This study is particularly notable as it emphasizes on safe and standard method of male catheterization among health care assistants, which is most common procedure to be performed in day to day medical practice.

Key Words: Male urethral catheterization, Nurses, House surgeons, Post graduate residents.

INTRODUCTION

Urethral catheterization is a routine medical procedure that facilitates direct drainage of the urinary bladder. It may be used for diagnostic purposes (to help determine the etiology of various genitourinary conditions) or therapeutically (to relieve urinary retention, instill medication, or provide irrigation).^{1,2}

The basic principles underlying urethral catheterization are gender-neutral, but the specific aspects important in the technique of male catheterization are evaluated in this article.

Aim &Objective :-The objective of this study is to evaluate the standard and safe catheterization method among the both male and female trained nurses , house surgeons and Post graduate residents of R.L.J.Hospital,

and educating them regarding the same, by which, they can be able to perform catheterization without any complicationssuch as urethral injury, creation of false passage, need of suprapubic catheter placement and can avoid unnecessary emergency department visits for urologists.

MATERIALS AND METHODS

Both male and female trained nurses , house surgeons and Surgical and non-surgical post graduate residents of R.L.J.Hospital are made to record their technique of male catheterization, in a standard proforma prepared for this study, which will be then compared with the standard and safe catheterization technique and results obtained will be analysed in terms of percentage. Any participants with deviation from the standard method, an attempt will be made to educate them.

¹Department of General Surgery, Sri Devaraj Urs Medical College And Research Centre, Kolar, India

²Department Urology, Sri Devaraj Urs Medical College And Research Centre, Kolar, India

³Department General Surgery, Sri Devaraj Urs Medical College And Research Centre, Kolar, India

⁴Department of Urology, Sri Devaraj Urs Medical College And Research Centre, Kolar, India

Correspondence and Reprint Requests: Vivek Harihar

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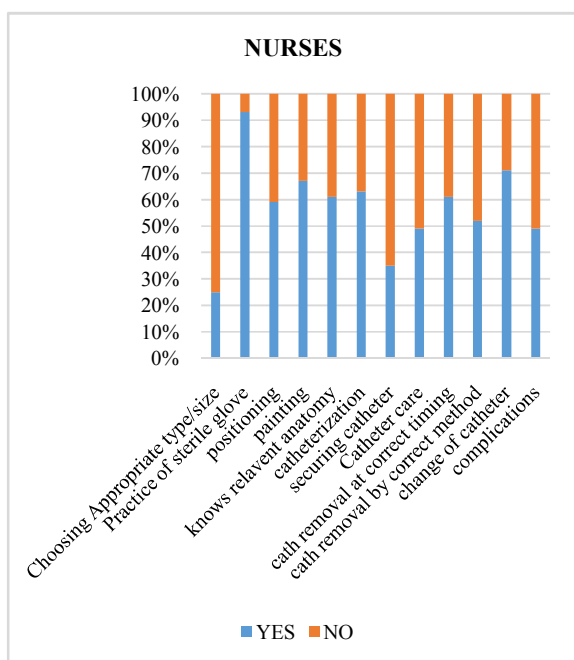
RESULTS

Study consists of a total number of 250 participants, which includes 100 house surgeons (HS), 100 nurses (N) and 50 residents (PG).

Evaluation among male and female Nurses (n=100)

Table-1

NURSES	YES		NO	
	(number)	(percentage)	(number)	(percentage)
Choosing appropriate type/size	25	25	75	75
Practice of using sterile glove	93	93	7	7
Positioning	59	59	41	41
Painting	67	67	33	33
Knows relevant anatomy	61	61	39	39
Catheterization	63	63	37	37
Securing catheter	35	35	65	65
Catheter care	49	49	51	51
Catheter removal at correct Timing	61	61	39	39
Catheter removal by correct Method	52	52	48	48
Change of catheter	71	71	29	29
Complications	49	49	51	51



Graph-1

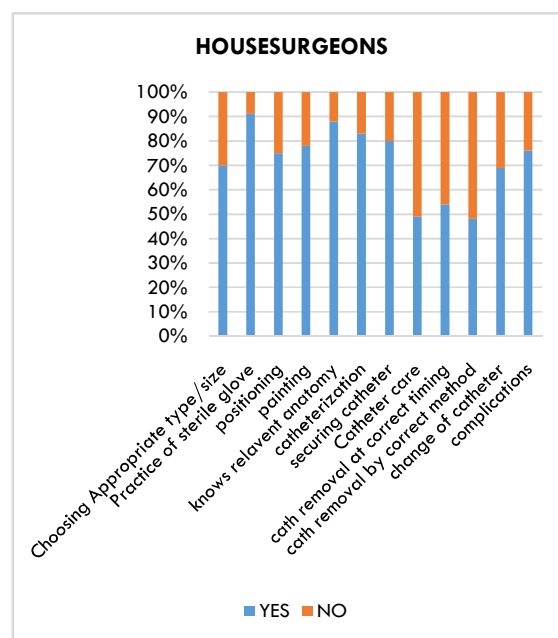
Among 100 nurses (Table-1 and Graph-1), 40 were male and 60 were female, 75% of them were unable to choose the appropriate type/size for given particular patient. 37% of them were unaware of the catheterization procedure. 65% and 51% of nurses do not know how to secure the catheter and give catheter care respectively. 39% and 48% of them do not know the ideal time to remove the catheter and its correct method respectively. 29% of nurses do not know when to change the catheter in chronic bed ridden patients. 39% and 51% of them were unaware about the basic

relevant anatomy of male urethra and the complications associated with catheterization.

Evaluating the House Surgeons (n = 100)

Table-2

INTERNS	YES		NO	
	(number)	(percentage)	(number)	(percentage)
Choosing appropriate type/size	70	70	30	30
Practice of using sterile glove	91	91	9	9
Positioning	75	75	25	25
Painting	78	78	22	22
Knows relevant anatomy	88	88	12	12
Catheterization	83	83	17	17
Securing catheter	80	80	20	20
Catheter care	49	49	51	51
Catheter removal at correct Timing	54	54	46	46
Catheter removal by correct Method	48	48	52	52
Change of catheter	69	69	31	31
Complications	76	76	24	24

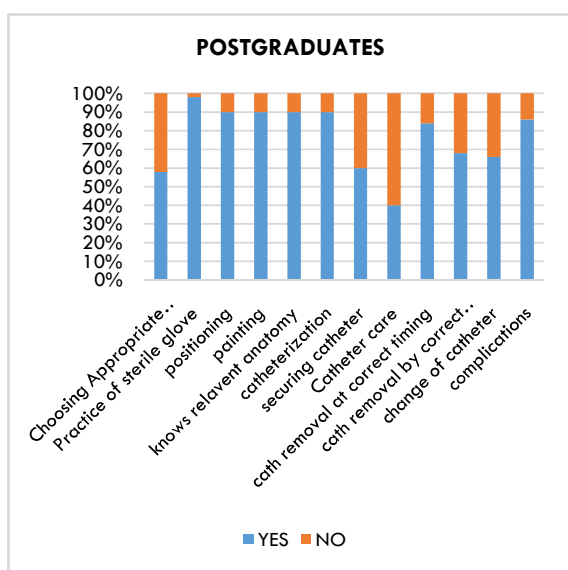


Graph-2

Among 100 House-surgeons (Table-2 and Graph-2), 30% of them were unable to choose the appropriate type/size for given particular patient. 17% of them were unaware of the catheterization procedure. 20% and 15% of house-surgeons do not know how to secure the catheter and give catheter care respectively. 46% and 52% of them do not know the ideal time to remove the catheter and its correct method respectively. 31% of nurses do not know when to change the catheter in chronic bed ridden patients. 12% and 24% of them were unaware about the basic relevant anatomy of male urethra and the complications associated with catheterization.

Evaluating the Post-graduates (n=50)**Table-3**

POSTGRADUATES	YES	NO
Choosing appropriate type/size	29 (58%)	21 (42%)
Practice of using sterile glove	49 (98%)	1 (2%)
Positioning	45 (90%)	5 (10%)
Painting	45 (90%)	5 (10%)
Knows relevant anatomy	45 (90%)	5 (10%)
Catheterization	45 (90%)	5 (10%)
Securing catheter	30 (60%)	20 (50%)
Catheter care	20 (50%)	30 (60%)
Catheter removal at correct Timing	42 (84%)	8 (16%)
Catheter removal by correct Method	34 (68%)	16 (32%)
Change of catheter	33 (66%)	17 (34%)
Complications	43 (86%)	7 (14%)

**Graph-3**

Among 50 surgical and non-surgical post graduate residents (Table-3 and Graph-3), 42% of them were unable to Choose the appropriate type/size for given particular patient. 5% of them were unaware of the catheterization procedure. 20% and 30% of residents do not know how to secure the catheter and give catheter care respectively. 8% and 16% of them do not know the ideal time to remove the catheter and its correct method respectively. 17% of nurses do not know when to change the catheter in chronic bed ridden patients. 5% and 7% of them were unaware about the basic relevant anatomy of male urethra and the complications associated with catheterization.

Previous year statistics in R.L.J. Hospital

Total number of catheterization – 1847

- ✓ Traumatic Catheterization – 84
- ✓ Failed Catheterization by junior doctors subsequently catheterised by senior doctor – 58
- ✓ Failed catheterization requiring SPC – 27

- ✓ Traumatic catheterization resulting in ancillary procedure like cystoscopic placement of catheter - 16

DISCUSSION

Difficulty in placing a Foley catheter is a commonly encountered problem among nurses, undergraduates and also residents. When one encounters difficulty in placing a Foley catheter using a regular technique, it has been recommended to use a reinforced tip catheter, such as a Coudé tip catheter for patients with benign prostatic hyperplasia (BPH). It is also a common tendency to push harder when one encounters difficulty in placing a Foley catheter. However, in the presence of a urethral stricture, the use of excessive force or reinforced catheters increases the risk of false passages which may require a more complicated endoscopic procedure or suprapubic catheter placement.

Nurses

In the study 75% of the nurses were unable to choose the appropriate size for a given particular patient for which they have to be educated regarding various urethral catheters with their sizes. 37% of nurses are unaware of the urethral catheterisation but it is the nurses who undertake the majority of catheterisations in primary care and hence they should be educated about the indications and as well as the contra-indications of the procedure. Since most of the nurses do not know the relevant anatomy of the male urethra and bladder, they should be educated through lectures, audio-visual aids and demonstration classes. It is always a good practice to supervise the procedure by a senior nurse during the initial days of practice. Nurses bed side catheter care should be assessed by a senior doctor during the rounds.

House-surgeons

Though House-surgeons will be the first line of contact to the patients in most of medical college hospitals and tertiary care centres, they should be thought to handle difficult catheterisation procedure like in case of prostatomegaly and pelvic injuries to choose the appropriate size and type of catheter for a given particular patients. Since majority of House-surgeons (88%) were aware about the anatomy of the male urethra in our study the more emphasis should be given to the practical aspects. This can be achieved by conducting a special theory class on minimally invasive procedures at the beginning of their internship which may also include other minor procedures like Ryle's tube insertion, intravenous cannula placement, intra muscular injections etc. Method of catheterisation should be properly demonstrated to the interns by a surgeon or urologist before practicing on patients and subsequently their procedure should be monitored by post graduates. Panel discussion regarding these minor procedures will

be helpful to share their knowledge and experience encountered during tough situations among themselves.

Post-graduate residents

A clinical post graduate should always be aware of the indications, contraindication and complication associated with the catheterisation. In case of catheterisation failure or acute urinary retention secondary to stricture, BXO and etc, post graduates should be able to perform supra pubic cystostomy. It must be recommended that surgical post graduates should have a compulsory urology posting during their Master degree course.

Authors describe the standard method of male urethral catheterization as follows, (Anexure 1)

Prophylactic antibiotics

General opinion is that the use of prophylactic antibiotics should be reduced.⁹ NICE guidance is that antibiotic prophylaxis should be used when changing catheters only in those with a history of CA-UTI or those at risk of endocarditis.¹⁰ Single-dose aminoglycosides or oral fluoroquinolones are the agents of choice with the exception of the prevention of endocarditis, where combinations active against streptococci are recommended.

Anexure 1

Procedure

1. Part preparation should be done.
2. Proper hand washing by standard method.
3. Gloves must be worn while starting the procedure, not only to protect the user, but also to prevent infection in the patient.
4. Choosing appropriate catheter type and size
 - Adults: – Catheter - Foley's, Size – 16F
 - Adult males with obstruction at the prostate: – Catheter - Coudé tip, Size – 18F
 - Adults with gross hematuria:- Catheter - Foley's, Size - 22/24F
 - Children:- Catheter - Foley's, Size – 12F (Age adjusted)
 - Infants younger than 6 months: - Feeding tube (5F) with tape.
5. Positioning - Place the patient in supine position in frog leg position, with knees flexed and uncover the genitalia.
6. Painting –
 - Prepuccial skin should be retracted
 - Paint the part by using a forceps to prepare the glans, penis, scrotum by betadine in circular motions with at least 3 times by different gauze-piece and put sterile drapes.
7. Penis should be hold with non-dominant hand by - a sterile gauze piece
8. Urethral preparation and analgesia :-

Using a Funnel cap of tube instil entire tube of sterile lidocaine gel 2% into the urethra. Place a finger on the meatus to help prevent spillage of the anesthetic lubricant. Allow 2-3 minutes before proceeding with the urethral catheterization, meanwhile lubricate tip of the Foley's catheter.

9. Urethral catheterization

While holding the penis at approximately 90° to the gurney and stretching it upward to straighten out the penile urethra, slowly introduce the catheter into the urethra. Continue to advance the catheter until the distal Y-shaped ports are at the meatus.

Wait for urine to drain into urine bag attached to the catheter from the larger port.

If there is spontaneous return of urine, then apply suprapubic pressure or try attaching a 60-mL syringe to aspirate urine. If urine return is still not visible, withdraw the catheter and reattempt the procedure.

After visualization of urine return, inflate the distal balloon by injecting 22/15/10 ml of distilled water for Foleys catheter size 24-22-20 / 18-16 / 14-10 respectively through the cuff inflation port and gently withdraw the tube.

10. If the patient is uncircumcised, make sure to reduce the foreskin, as failure to do so can cause paraphimosis.
11. Secure the catheter to the patient's thigh with a wide tape. Creating a gutter to elevate the catheter from the thigh may increase the patient's comfort.
12. Catheter care – Gently pull the proximal part of catheter about 5mm and apply betadine by using sterile gauze every day.
13. Catheter removal:- Timing- Ideally an indwelling catheter is removed early morning. In a bed ridden or post-operative patient, catheter should be removed when patient is ambulatory.
14. Method - Do not clamp the catheter before removing. When the time comes to remove the catheter, attach a syringe to the inflating port and draw back on the plunger to suck out the distilled water in the balloon till the tube collapses and then gently pull the catheter out.
15. A Foley's catheter should be changed for every 20-24 days in bed ridden patients and all silicon catheters can be placed for upto 6 weeks to 12 weeks.

Indications for urinary catheterization are

Intermittent catheterization⁵

- Collection of sterile urine sample.
- Provide relief of discomfort from bladder distention.
- Decompression of the bladder.
- Measure residual urine.

- Management of patients with spinal cord injury, neuromuscular degeneration, or incompetent bladders.²

Short-term indwelling catheterization⁷

- Post-surgery and in critically ill patients to monitor urinary output.
- Prevention of urethral obstruction from blood clots with continuous or intermittent bladder irrigations
- Instillation of medication into the bladder.
- Surgical procedures involving pelvic or abdominal surgery repair of the bladder, urethra, and surrounding structures.
- Urinary obstruction (e.g. enlarged prostate)³, acute urinary retention.⁴

Long-term indwelling catheterization⁸

- Refractory bladder outlet obstruction and neurogenic bladder with urinary retention.
- Prolonged and chronic urinary retention.
- To promote healing of perineal ulcers where urine may cause further skin breakdown.

Contraindications

Urethral catheterization is contraindicated in the presence of traumatic injury to the lower urinary tract (eg, urethral tear). This condition may be suspected in male patients with a pelvic or straddle-type injury. Signs that increase suspicion for injury are a high-riding or boggy prostate, perineal hematoma, or blood at the meatus.²

Types of Catheter

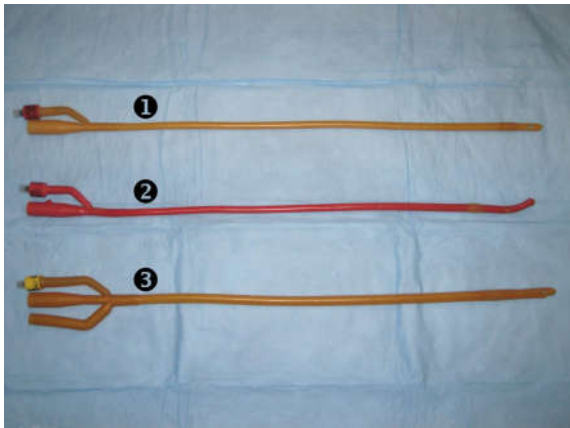


Fig-1

Urethral catheter types (Fig-1):

- 1) Straight tip
- 2) Coude tip
- 3) 3-way catheter irrigation.

Complications^{5,8}

Traumatic complications include:

- Creation of false passages.

- Urethral strictures.
- Urethral perforation.
- Bleeding.

Infective complications include

- Asymptomatic bacteriuria.
- Cystitis.
- Urethritis.
- Prostatitis.
- Epididymitis and epididymo-orchitis.
- Vesicoureteric reflux.
- Pyelonephritis.
- Abdominal wall infections (SPC).
- Bacteraemia, septicaemia and septic shock.

Additional complications of long-term catheterisation include

- Chronic renal inflammation
- Chronic pyelonephritis
- Nephrolithiasis
- Cystolithiasis
- Chronic renal failure
- Bladder cancer (rare)

Contraindications

Urethral catheterization is contraindicated in the presence of traumatic injury to the lower urinary tract (eg, urethral tear). This condition may be suspected in male patients with a pelvic or straddle-type injury. Signs that increase suspicion for injury are a high-riding or boggy prostate, perineal hematoma, or blood at the meatus. When any of these findings are present in the setting of possible trauma, a retrograde urethrogram should be performed to rule out a urethral tear prior to placing a catheter into the bladder.²

CONCLUSION

This study is particularly notable as it emphasizes on safe and standard method of male catheterization among health care assistants, which is most common procedure to be performed in day to day medical practice.

It is considered essential for safe patient care that basic practical clinical skills are in place at this early post medical school stage of a doctor's training.

Different educational interventions found to be effective in reducing catheter related complications. It was not possible to identify any one method as more effective. None of the studies cited any specific theoretical instructional approach able to underlie their teaching technique during their training sessions.

Training in catheterization is being redesigned in our institute in accordance with the findings of this study, and a further survey of these health care assistants in

two years will shed light in the effectiveness of these changes.

Author contribution

All authors contributed to the paper.

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