

# Difficult catheterization



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# Introduction

- Urinary catheterization is one of the most commonly performed procedures
- The difficult urethral catheterization (DUC) is one of the most common consultations for the general urologist

- DUC in male :

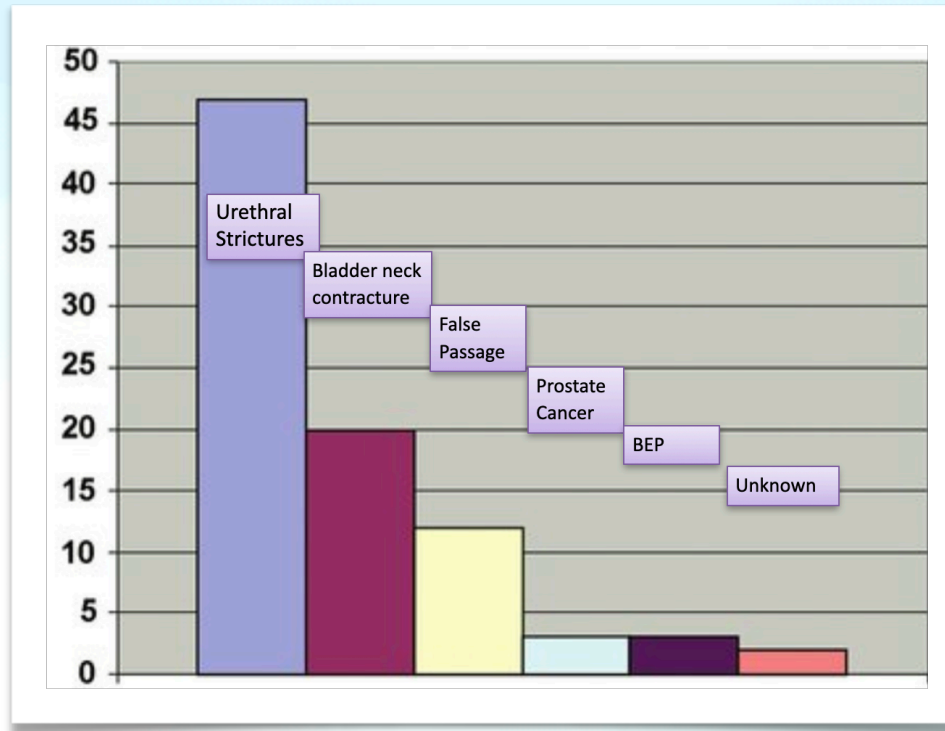
- BEP
- Urethral strictures
- Severe phimosis
- False passages

- DUC in female :

- Intravaginal retraction
- Obesity
- Stricture

- Increase healthcare costs due to increased hospitalization days, interventions, and complexity of follow-up

# Causes of difficult catheterization



*Carlos Villanueva et al, International Braz J Urol. 2010*

# Complications of DUC

- Several serious potential complications can significantly affect patient morbidity including :

- Urinary tract infections
- Urosepsis
- Fournier's gangrene

- Penile erosions
- Urethral rupture
- Ischemic penile necrosis

- Rectal perforation
- Life-threatening bleeding



# Issues with catheterization

- Little is taught about urinary catheterization during residency
- Generally allocated to the lowest level of training ( interns, nursing students)
- Current emergency medicine teaching does not offer much guidance for managing difficult catheterization
- Difficulties are compounded by:
  - lack of a standard protocol for difficult catheterizations
  - suboptimal technique
  - insufficient knowledge of urological anatomy
  - inadequate skill level of those performing

# General Preparations

- First, make sure the catheter is absolutely necessary
- **If you eliminate the need for the catheter, you've solved the problem!**
- 20–50 % of all indwelling catheterizations in hospitals were unnecessary and inappropriate\*
- Review the patient's history for any previous urological problems and any problems with prior catheterizations?
- Gather all the supplies you will likely require

# General Preparations

- Elevate the bed to a comfortable level and ask the patient to move closer to your side of the bed so you don't have to lean over
- Wear a gown for protection and make sure you have sufficient light
- Ask for a portable surgical spotlight or at least a flashlight if no other lighting is available
- Place the patient in optimal position and have at least one person to assist you

# Standard urethral catheterization technique of female patients (modified from SUNA Clinical Practice Guidelines )



- Initial hand washing and personal protective equipment, including wearing of cap and mask, are recommended.
- Place patient in the supine lithotomy position with legs apart and knees flexed.
- Identify the external urethral meatus, which will be below the clitoris and above the vaginal orifice. Use an expanding circular motion to clean the vulvar outlet and labia with betadine or chlorhexidine and place appropriate sterile fenestrated drapes.
- Wearing sterile gloves, use the left hand, exposing the urethral meatus by separating the labia with the thumb and index fingers.
- Identify the external urethral meatus and lubricate the distal end of the catheter with the sterile jelly. Carefully insert lubricated catheter (double-lumen, straight-tipped), gently advancing into the bladder. If a catheter inadvertently ends up in the vagina, leave it there to act as a landmark and get a new, sterile catheter for the bladder.
- Once the catheter is well-placed inside the bladder and the urine is seen coming out, continue to advance the catheter to ensure complete insertion of the balloon into the bladder; then inflate with 10 mL of sterile water.



# Standard catheterization technique for male patients

## (modified from SUNA Clinical Practice Guidelines)



- Assemble all of the necessary equipment before beginning the procedure.
- Initial hand washing and personal protective equipment, including wearing of cap and mask, are recommended. Washing the penis and male genitalia is recommended.
- Prepare and drape the penis and surrounding area under sterile technique.
- Cleanse the urethral meatus with the antiseptic solution of choice (e.g., povidone-iodine, chlorhexidine).
- Maintain aseptic technique during the cleansing of the meatus.
- Before grabbing the penis, have all required supplies opened and immediately available for access by the remaining sterile hand.
- If available, retrograde injection of 10–20 mL of a water-soluble lubricant or water-soluble 2 % lidocaine hydrochloride jelly can be helpful.
- The catheter should be well-lubricated before advancement occurs.
- Gently hold the penis upwards and place the catheter in the urethral meatus by grasping the catheter an inch or two from the tip.

- As you advance the catheter, begin to gently stretch the penis downwards toward the feet to minimize the angulation between the bulbous urethra and the prostate.
- As you reach the membranous urethra, you may encounter some mild resistance to further advancement of the catheter. Ask the patient to take a deep breath to help relax the sphincter or ask him to try and void. This will often allow easier catheter passage.
- If resistance is met, do not attempt forceful catheter insertion; instead, apply slow, gentle pressure and slightly twist the catheter from right to left and back for 30–60 seconds to allow for relaxation of the external sphincter muscle.
- Once the catheter is well-placed inside the bladder and urine is seen coming out, continue to advance the catheter all the way to the Y-Hub bifurcation to ensure complete insertion of the balloon well into the bladder. Then inflate the balloon with 10 mL of sterile water. Do not use normal saline to inflate the balloon.
- Replace the foreskin over the head of the penis to avoid paraphimosis in uncircumcised males.

# Morbidly obese female patients

- May require multiple assistants for visualization and access to the introitus and urethral meatus
- Trendelenburg position allow easier retraction of the panniculus and better exposure
- Using pads, towels, blankets, or even a bed pan underneath the patient to elevate the pelvis
- Use of a vaginal speculum and optimized lighting help



# Morbidly obese female patients

- Place a finger into the vagina about 2 or 3 cms below the clitoris and then push slightly in and upwards
- Betadine swab wiping, coughing or Valsalva will often provoke a twitch or “**wink**” of the meatus
- Touch with a single finger gently introduced into the vagina along the anterior surface (feel much like a buttonhole)
- Finger can direct a coudé catheter into the urethra and bladder

# Morbidly obese female patients

- 12 French catheter can be used to gently probe the area of the expected urethral meatus
- Every possible hiding place, fold and dimple along the anterior vaginal wall may need to be gently probed to find the true urethral meatus

# Difficult male catheterization

- Problems that can interfere with male catheterization include:

Penile  
edema

Urethral  
Strictures

Phimosis

Prostate  
Cancer

False  
Passages

Prostatectomy

# Difficult male catheterization

- **Phimosis**

- Pull the foreskin directly outward which will telescope the skin and usually help open the passage enough to allow visualization
- A coudé catheter can be used with or without guide-wire
- If unsuccessful, a dorsal slit may be required

- **Penile edema**

- Compression
- Anoscope, rigid cystoscope or small vaginal speculum through the swollen foreskin

# Difficult male catheterization

- **Absolutely contraindication of transurethral catheterization :**
  - **suspected urethral injury**
    - meatal blood, a high-riding prostate and urinary retention
  - Retrograde urethrography and proceed

# Standard Catheterization Technique

- Standard practice :advance the catheter unto to the Y-hub bifurcation
- If the catheter is trying to expel itself :probably not properly positioned
- Just because the Foley is draining urine  $\neq$  balloon is completely within the bladder
- Any pain on balloon inflation indicates possible catheter malposition



# Difficult male catheterization

- Indwelling urinary catheters used in common practice include

- Latex or silicone Foley (self-retaining balloon)
- Irrigating or three-way (used for severe or active bleeding)
- Coudé or curved tip catheters

- The initial use of a plain 16 or 18 Fr catheter is reasonable for most men
- For difficult urinary catheterizations, the next step : 16 or 18 Fr coudé (successful in 41–54 %)\*

*\*Villanueva C, Hemstreet III GP et al, AUA Update Series. 2011*

# Difficult male catheterization

- If unsuccessful, this should be followed by a 12 French silicone Foley catheter

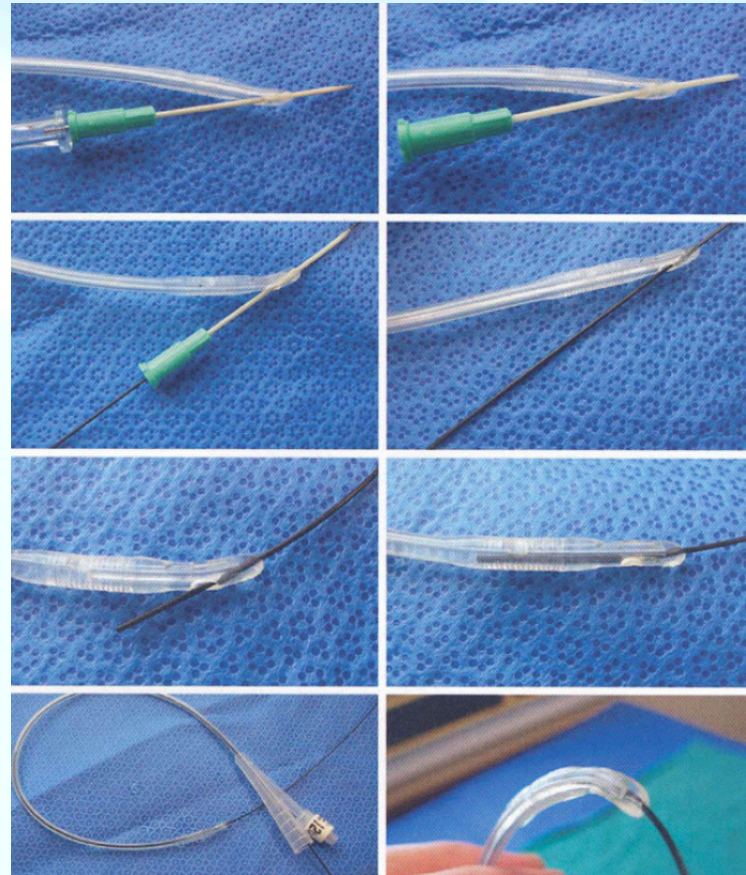
- small outside diameter,
- coiling resistance,
- rigidity
- relatively large internal lumens

- The Liss maneuver can be used to stiffen the shaft of a Foley catheter

- The floppy end of a guide wire is introduced
- increases stiffness ~360 %
- Improves navigation

# Difficult male catheterization

- Guide wire can be successfully placed in 80% of cases in which catheters could not be advanced
- The Blitz technique

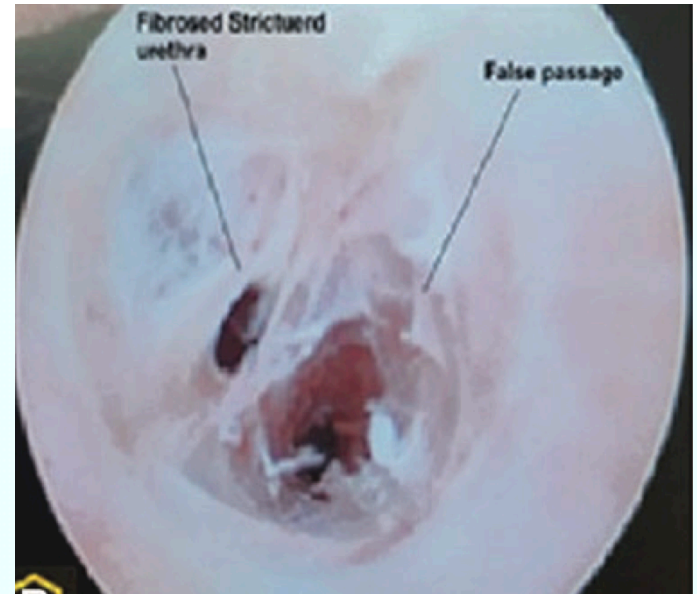


# Difficult male catheterization

- If not successful passing the guide wire initially:
  - place the Foley catheter as far into the urethra as it will go
  - then try to pass the guide wire around the catheter.
- If this fails, go to direct vision with flexible cystoscopy and facilitated guide wire placement

# About Urethral injury

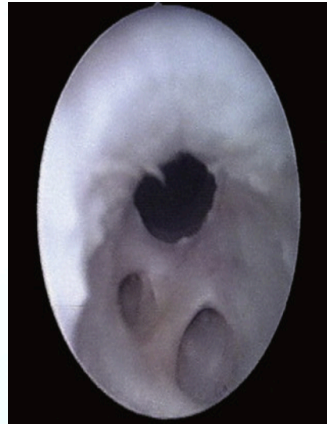
- The most common locations : bulbous and posterior urethra.
- New false passages will often be lateral or posterior and tend to have sharp, bleeding edges.
- True urethral lumens generally have blunted edges and are usually located more anteriorly.





# About Urethral injury

- Any small urethral dimple or crease could be the true passage
- All such potential lumens should be gently probed with the guide wire before abandoning the procedure



- Applying external suprapubic pressure will often express some bladder fluid from the true lumen which assists with cystoscopic visual identification



# About Urethral injury

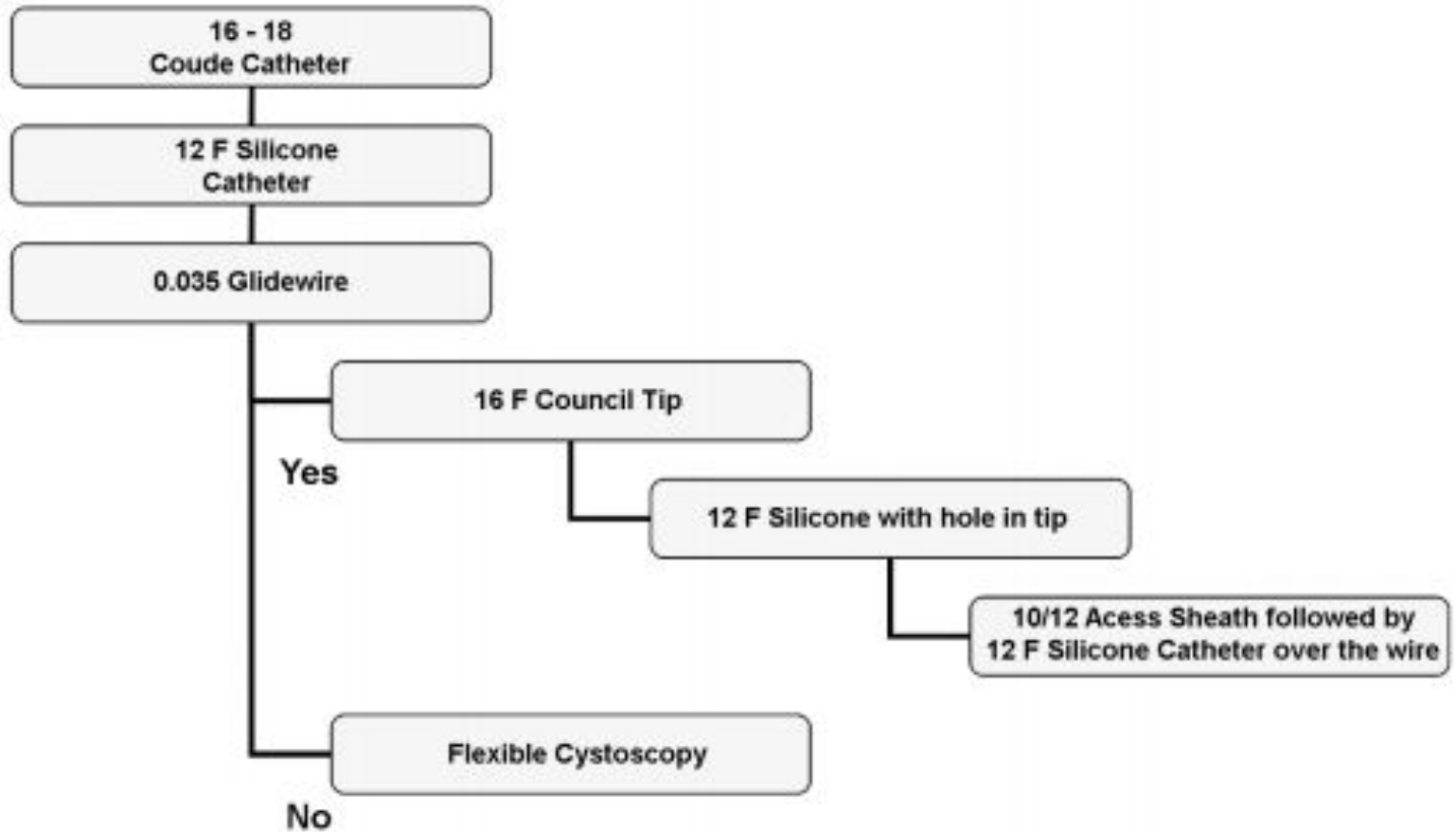
- In case of excessive bleeding:
  - squeezing the normal saline irrigating fluid bag can help maintain visualization
- If all attempts to place a guide wire fail, there may be no choice but to consider suprapubic catheter placement.

# Direct Vision Catheter

- Microendoscopic systems with fiberoptic lights and cameras
- Permit real-time video monitoring while advancing specially designed coude catheters through the urethra




# Summary



*Figure 4 – Difficult urethral catheterization algorithm.*



An aerial photograph of a cityscape under a dramatic, cloudy sky. In the foreground, a large rooftop is covered with numerous blue solar panels. The surrounding city features various multi-story buildings, some with red facades, and a mix of urban infrastructure. In the distance, blue mountains are visible against the horizon. A dark green rectangular banner with the text "Thank you" is overlaid on the lower right portion of the image.

Thank you