Tips and Tricks for Difficult Urethral Catheterization

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ABSTRACT

Male urethral catheterization may be difficult in patients with enlarged prostate glands or other potentially obstructive conditions as urethral stenosis, after prostatic TUR undermining bladder neck, old and recent false passages, sphincteric spasm among others. Alternative techniques or tricks to surpass problematic urinary catheterization are usually known by experienced nurses and physicians. If repeated catheterization attempts are done, the risk of failing and complications appearing increase significantly. Improper insertion of catheters also may increase healthcare costs due to prolonged hospitalization, immediate and/or delayed surgical interventions transforming a minor technique into a huge problem for the patient, doctors, and healthcare system. Improved techniques for catheter placement are essential for all healthcare personnel involved in the management of the patient needing a urethral catheterization, including nurses and doctors from both primary and hospital medicine. The aim of this article is to show some tips and tricks that may be helpful for the blind placement of urethral catheters. The phrase "primum non nocere" acquires its maximum meaning in this context. Sanitary personal must be prudent in the number of attempts, have a clear strategy of what can be done in each moment and know how to stop or seek help in case of not being able to probe the patient in 2 or 3 attempts. If all these recommendations fail a urologist have to be required to place a catheter in a safe way including the use of endoscopic optic devices.

Keywords: Catheterization, difficult, tips

1. INTRODUCTION

Acute urinary retention (AUR) and other genitourinary conditions often lead to difficult catheterizations. Male catheterization, in particular, can be difficult, especially in patients with enlarged prostate glands or other potentially obstructive conditions in the lower urinary tract (1,2,3,4). Solutions to problematic urinary catheterization are not well known and, when it occurs, the risk of failed catheterization and concomitant complications increase. Repeated unsuccessful attempts at urinary catheterization induce stress and pain for the patient, injury to the urethra, potential urethral stricture requiring surgical reconstruction, and problematic subsequent catheterization. Improper insertion of catheters also can significantly increase healthcare costs due to added days of hospitalization, surgical interventions, and increased complexity of follow-up evaluations (4,5,6,7,8).

During university training, nurses and physicians are taught to perform standard catheterization focusing on prevention of urinary infection but almost no information is given about how to face difficulties when placing a urethral catheter.
Improved techniques for catheter placement are essential for all healthcare personnel involved in the management of the patient with AUR, including attending nurses who often are the first to catheterize such patients (3,4,7,8).

The aim of this article is to show some tips and tricks that may be helpful for the blind placement of urethral catheters. If all these recommendations fail a urologist have to be required to place a catheter in a safe way including the use of endoscopic optic devices (9,10).

2. DISCUSSION

Nursing staff have to attempt placement of a urinary catheter in many different and complicated situations as AUR, need to measure diuresis, catheterization of surgical or intensive care unit patients, urgent care situations, control of hematuria, etc. This situation induces pain for the patient and uses to lesion the urethra creating false passages which may do impossible blind urethral catheterization and will obligate to place a suprapubic catheter or to perform an optically helped passage with a rigid or flexible cystoscope. Moreover, posterior healing of this lesions may create a urethral stricture or other definitive problems requiring surgical reconstruction (3,6,8).

If unsuccessful, repeated attempts with the same catheter are usually done, Catheterization with a different size or consistency probe (typically larger or harder) may be attempted or another more experienced healthcare worker may help in the process. Such multiple attempts frequently result in injury to the urothelium, which is only 3 to 4 cell layers in thickness (7,8).

Uncontrolled repeated blind attempts of catheterization should be avoided to prevent escalation of a complex injury from what is normally considered a minor procedure. Only nurses or emergency physicians properly trained, and with a clear strategy to face the situation, may repeat blind catheterization. If nobody fulfills this characteristic, a urologist has to be requested to decide about any new attempt of blind catheterization or to perform endoscopic maneuvers (3,4,6,7).

Little is taught about difficult catheterization during nurse training which is more focused to prevent urinary infection by cleaning properly external genitalia or to create a close urinary circuit. Our main intention is to overpass this lack of formation by refreshing readers the principles of urethral catheterization, showing some tips and tricks that may be helpful in the blind placement of urethral catheters and finally remaining post catheterization care recommendations. All together may assure a safe probe placement that will avoid complications for the patient, difficulties for the physicians and will reduce cost of sanitary attention (1,5).

Catheter placement

We are not going to remember the capital importance of placing a urethral probe with the maximum asepsis to avoid or delay urinary tract infections, both in men and women. First of all, it is important to choose the right side of the bed or stretcher. If you are right-handed, the best place for urethral catheterization is patient’s right side. But, if you are left-handed, better choose the opposite side.

Second, inject 10 to 15 mL water-soluble lubricant-anesthetic through the urethral meatus with a syringe or an accordion applicator. Use of urethral clamp or a tie with a gauze prevents the gel from leaking out of the urethra. It may be placed 1-2 minutes before catheter insertion in order to anesthetize mucosa reducing patient’s pain, to distend urethra facilitating catheterization and to inhibit sphincter contraction permitting pass through it more easily.

The contraction of the sphincter is stronger in the younger patients so, in them, even more, precautions should be taken. If a catheter doesn't advance through the membranous urethra of a young patient, without antecedents of urethritis or previous urethral manipulation, a spam of the sphincter may be suspected; in this case, just maintain the catheter pushing gently over the sphincter until it opens permitting catheter passage (6,8).

Third, ask the patient to breathe deep and slowly to help relax when catheter approaches the urethral sphincter. Then, elongate penis in an upright position at ≈30° angle respects the horizontal line by tractioning the plans penis without compressing underlying urethra. This maneuver will reduce the angle between posterior and prostatic urethra facilitating catheter insertion and passage through external sphincter (1,7,8).

Four, in cases of prostatic hyperplasia, the angle between posterior a prostatic urethra is increased difficulting catheter pass through the sphincteric urethra. Bigger prostate glands are associated with higher angles which may pass from 30° up to 60° difficulting catheter passage (Fig 1).
Figure 1: Urethral angulation, false passage production and how to avoid it

It is important to say that 90% of the false passages are done because a straight continuation of the catheter tip perforating the posterior urethral wall instead of moving up to the prostatic lumen (Fig 1). Combination of sphincter contraction and change of direction (urethral angle) make this point a crucial place of urethral passing. To reduce this angle we may apply mild but firm traction over the penis with one hand while introducing the catheter with the other. In some cases, to apply pressure over the perineum may be helpful reducing this angle permitting the pass of the probe (Fig 1).

However, using a Coudé probe is even more important for a successful catheterization. The rationale of Coudé catheters use is to negotiate better the angle between the bulbar urethra and prostatic urethra. The utility of using these catheters is directly related to prostatic size (3,5).

Figure 2: Correct insertion of the urethra and 3 hands urethral catheterization

If the first attempt is unsuccessful due to an obstruction at bulbar urethra, repeat catheterization with an 18-Fr Coudé catheter. Especially if you think that problem is surpassing the prostate; this kind of probe offers advantages to negotiate the prostatic-urethral angle.

Always complete catheter insertion to the Y hub (Fig 2). Urine may drain while catheter tip is placed anywhere beyond membranous urethra/external sphincter, most commonly in the posterior urethra. Initial return of urine often is mistaken as an indication that catheter reached the bladder. Insertion to the bifurcation of the Y ensures catheter has reached the bladder. Premature balloon inflation, when the return is present but catheter is not inserted into the bifurcation, will damage the urethra and can cause significant hematuria (2,5,6).
When bladder neck is anatomically placed at a high position or there is a significant step developed between prostatic urethra and bladder (as a consequence of a transurethral resection) passing a straight catheter may be very difficult. A Coudé tip may allow negotiation of the elevated lip located at 6-o’clock; maintain curved tip at 12-o’clock position (curved tip pointing up) marked at the connector end of the catheter. If catheter cannot be passed, pull back 2 to 3 cm, rotate it to 9-o’clock position and/or to the 3-o’clock position, and reinsert (1,5,6).

However, if these maneuvers are also unsuccessful a novel technique that we called “three hand catheterization” may be attempted. One person has to introduce a finger in the rectus and elevate the prostate to reduce the neck step. At the same time, another person tract up to the penis shaft with one hand while introducing the probe with the other (Fig 2). If this maneuver is also unsuccessful or you think that the problem is a urethral stricture, make a new attempt with a smaller-caliber silicone catheter (12-Fr) also with a Coudé tip positioned upward. Silicone material adds stiffness and limits coiling which is ideal for advancing through medium-sized strictures and bladder neck contractures. However, these catheters are potentially harmful and never have to force or make excessive pressure for the risk of false passage (1,5,6,7,8).

Placement of a urethral catheter assisted with a guidewire is an excellent option in cases of difficult catheterization. In some occasions, the advance of the probe through the stenotic area may be very difficult even using catheters more rigid than a standard Foley probe. Moreover, the wire may kink during passing maneuvers which may necessary to change it (11,12,13,14,15,16,17).

In difficult cases, introduce soft-end of the 0.035-Fr glidewire (hydrophilic guide-wire), into the bladder being sure that at least 10 cms are rolled up inside it (Fig 3). Then perforate the tip of a 14-Fr Foley catheter (Fig 3) and pass the guide-wire through it progressing the catheter with the Seldinger technique until is properly place inside the bladder (Fig) (18,19,20).

Sometimes, the Foley catheter is too soft to progress and the maneuver may be unsuccessful or even the wire may kink when trying to overpass a urethral stenosis (Fig 3.2A) (18). Then an 8-Fr ureteral catheter is passed over the wire until the tip is inside the bladder to add stiffness making easier to pass the final catheter (Fig 3). Then, prepare the definitive silicone catheter by cutting the tip of it (Fig 3). Lubricate the catheter...
properly and pass it over the ureteral catheter until is deeply inside the bladder. Then remove both the wire and ureteral catheter leaving the probe in place(15,16,17,18,19,21).

In cases, not reducible phimosis and/or severe edema of the penis, it may be difficult to see the urethral meatus. This is not an important challenge, after retracting the skin as much as possible, just maintain the glans penis in between two fingers and introduce the catheter straightly in a blind way. The catheter will enter the urethra without problems in almost all cases (2).

**Post catheterization care recommendations**

If urine doesn't drain after the introduction of the catheter check that it is introduced up to the Y. Just a visual inspection was enough to diagnose the problem in this patient who presented intense pain post urethral catheterization (Fig 4). The length of the catheter outside the penis is too long so it is impossible that the balloon reached the bladder. A new catheter was properly placed and the difference in external length is easily seen (Fig 4). If a patient refers to pain, present hematuria or urethrorrhagia or catheter is not properly working, a not correctly placed probe has to be always suspected (Fig 4).

![Image 1](image1.png)

**Figure 4:** Probe of the balloon inflated inside the urethra. Optical aspect

Even if a small-caliber catheter is properly placed may fail urine drainage. Check that catheter’s lumen is not obstructed by the dense non-hydrophilic lubricant. A bladder wash with 60 cc of saline will deobstruct it easily, however, the possibility of an anuric patient with an empty bladder have to be also considered (6,8).

In uncircumcised patients, reduce foreskin to the anatomic position after the procedure is complete. This maneuver prevents paraphimosis appearing, which can lead to ischemia of the glans penis (2,6).

When a patient suffering urinary retention with high urinary volume, we should empty the urine progressively, not more than 400 cc at each time. If not, hemorrhage “ex vacuo” from the bladder veins themselves will be present. This kind of bleeding appear when the bladder has been for a long time influenced by the high pressure of the retained urine, suddenly gets rid of that pressure by drawing away the urine. Consequently, the weak blood vessels too suddenly fill up with blood, leading to a rupture of their walls (2,7).

Urethral strictures are one of the most frequent reasons of difficult catheterization. A rigid small-caliber 12-Fr catheter without a balloon is very useful in this cases but probe fixation after catheterization is a challenge (5,6,7,8).

If a probe without balloon is used, its fixation is a problem that has to be solved once the difficult catheterization was achieved. Silk stitches between the foreskin and the thick part of the probe are painful and may lead to urine leaking if the catheter wall is perforated. Usually, catheters without balloon are changed by a ballooned one 2-3 days later.

For this reason, a fixation with adhesive tape is another practical option. We propose a novel way to perform a temporary fixation of the urethral catheter by using 2 “H” shape handmade pieces which have to be attached to the shaft of the penis and the catheter as may be seen in the different stages of figure 5. Finally, a circular piece of tape has to be placed to secure the “H” shape tapes to the shaven penis.

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Figure 5: Fixing technique of not ballooned catheters


