Patterns of urinary catheter consults in a tertiary care hospital

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Introduction: *We reviewed the consultation patterns for difficult urethral catheter placement in tertiary care hospitals and developed a treatment algorithm for this common request.*

Materials and methods: *We identified all urethral catheter consults obtained by urology residents at three tertiary care hospitals from October 2009 through October 2010. Only consults for inability to place urethral catheter by the referring team were included; hematuria or clot retention were excluded. Patient age, date of consultation, consulting service, prior urologic history, initial number of attempts, and final outcome were recorded.*

Results: *Eighty-one consults were recorded. Seventy-seven (96%) were male; the median age was 65 years. The most common consulting services were internal medicine (35%), intraoperative consults (17%), and the intensive care unit (17%). In 90% of cases, an initial attempt at catheter placement was attempted; 62% of these were made by nurses. Over half of patients had known urologic pathology. In 70% of cases, successful placement without other adjuncts was achieved by the urology resident. Twenty percent of patients required cystoscopic manipulation; nine percent required suprapubic tube placement.*

Conclusions: *Catheterization was achieved without adjunct procedures in the majority of consults. These results support an algorithm in which all patients without a prior history of lower urinary tract pathology should undergo an initial placement attempt by the primary service physician. They also underscore the need for educational efforts to improve non-urologists' comfort level with placement of a standard Foley or Coudé catheter.*

Key Words: urethral catheterization, Foley catheter, resident education, residency training

Introduction

Urethral catheters are commonplace in hospital inpatients. Up to 25% of patients in American hospitals have a urethral catheter placed during their stay.[1] This procedure is most often performed by a registered nurse. However, urologic consultation is often obtained when the patient has a history of being a 'difficult catheterization' or when the nursing staff or primary team encounters difficulty placing a urethral catheter.

Despite the high rate of urethral catheterization and the prevalence of urologic pathology in the inpatient population, there are limited data analyzing consults for the 'difficult catheter'. We reviewed the experience of urology consult residents at a tertiary academic center to understand consultation patterns and develop an evidence-based algorithm to guide management in situations in which difficulty is anticipated or encountered. An improved understanding of the patient and physician population who commonly requires assistance for urethral catheterization may provide insight into identifying which patients are most at need for urologic consultation and identify skills that non-urologists can acquire to improve the delivery of safe and efficient patient care.

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Materials and methods

All data were collected in a de-identified manner. The urology consult residents (PGY3-5) on call for Stanford Hospital & Clinics (SHC), the Palo Alto Veterans

Affairs Hospital (PAVA), and Santa Clara Valley Medical Center (SCVMC) recorded all consecutive consultations for urethral catheterization during a 12 month period between October 2009 and October 2010. These three hospitals are tertiary care medical centers (academic non-profit, Veterans Affairs, and county-operated, respectively) that are staffed by urology residents from the Stanford Department of Urology program and collectively represent 1961 beds.

Only consultations for difficult catheter placement were recorded. Consultations for pediatric patients were excluded (age < 18 years), as were placements in the setting of hematuria or clot retention. For each patient, the following variables were recorded prospectively: age, gender, date of consultation, prior urologic history, number of initial attempts and performer of catheter placement, and the final outcome. Urologic history was categorized as isolated benign prostatic hypertrophy (BPH), history of pelvic or abdominal radiation therapy, prior lower urinary tract surgery, and other known urologic conditions (e.g. stricture).

Results

A total of 81 consults were recorded: 53 from SHC, 18 from PAVA, and 8 from SCVMC. Seventy-eight (96%) consults were for male patients, and the median age was 65 years. Table 1 shows the distribution by consulting service. The Medicine floor was the most frequent consulting service, accounting for 35% of consults.

Forty-four (54%) patients had a significant urologic history, including BPH, urethral stricture, bladder neck contracture after urologic procedure, prior urethroplasty, and prior transurethral resection of prostate. Of those with a urologic history, 12 patients had BPH, 7 had bladder neck contracture after radical prostatectomy or urinary diversion, 7 had a history of prior TURP, 6 had urethral strictures, 3 had a history of external beam radiation therapy, 2 had previously undergone urethral surgery, 2 had chronic indwelling catheters that had fallen out, 1 had undergone a prior penectomy, 1 had undergone brachytherapy, 1 patient performed intermittent catheterization for neurogenic bladder, 1 patient had a history of 'difficult catheter placement,' and 1 had an artificial urinary sphincter.

TABLE 1. **Breakdown of urethral catheter consultations by requesting service**

Service requesting consult	n (%)
Medicine floor	28 (35%)
Intraoperative	14 (17%)
Emergency department	14 (17%)
Intensive care unit	12 (15%)
Surgical specialties (not including intraoperative)	8 (10%)
Physical medicine and rehabilitation	2 (2%)
Psychiatry	2 (2%)

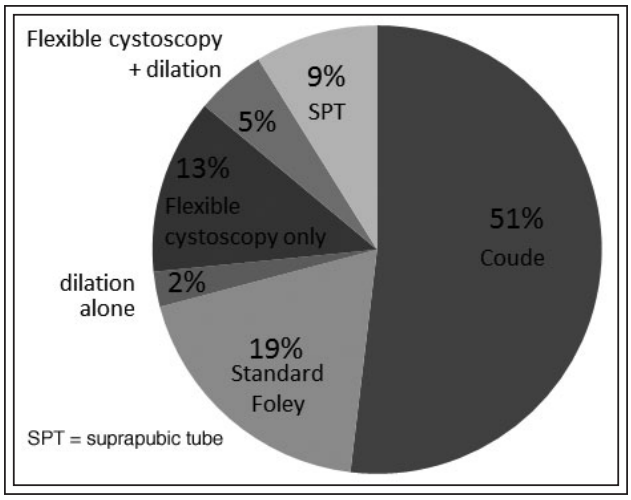

Figure 1. Technique resulting in successful catheterization.

An initial attempt at urethral catheterization was made by a nurse only in 50 cases (62%), by a nurse followed by the primary team physician in 23 cases (28%), and by no staff member in 8 cases (10%). Of those cases where no attempt was made prior to calling the urology service for consultation all patients had some type of urologic pathology, surgical history, or history of difficult catheter placement. There were no cases in which the primary team physician made the first attempt at catheter placement. Figure 1 shows the distribution of techniques that resulted in successful catheterization by the urology resident. None of the 81 cases required assistance of an attending urologist. If multiple techniques were used, the most complex technique was recorded. In some cases, the initial attempt was made by Coudé catheter; thus, utilization of this technique does not necessarily imply that a standard Foley catheter failed. In the majority of cases (70%), urethral catheterization was achieved by the urology resident, using either a standard Foley or Coudé-tipped catheter. Cystoscopy was utilized in 18% of cases, and suprapubic tube placement occurred in 9% of cases.

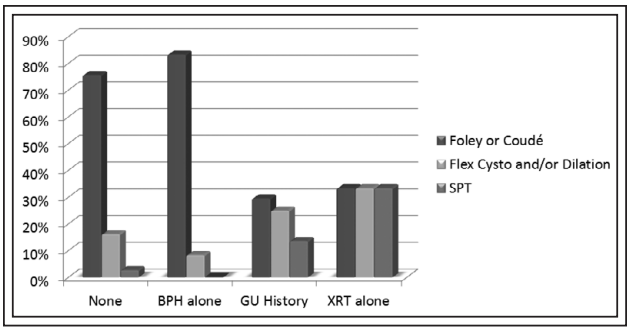

Figure 2. Successful technique based on patient history.

Figure 2 describes the successful techniques based on the urologic history of the patient. If the patient had no urologic history, or a diagnosis of BPH, standard catheterization techniques were successful 71% of the time. Conversely, patients with a urologic history were much more likely to require cystoscopic intervention and suprapubic tube placement.

The timing of consultation was also assessed, with the academic year divided into four quarters. A disproportionate number of consults (43%) occurred in the first quarter of the academic year (July to September), with the remainder of consults relatively evenly distributed between the other three quarters (Oct-Dec = 15%, Jan-March = 21%, and April-June = 21%).

Discussion

The primary finding of this study is that in the majority of consults sought for 'difficult catheterization,' catheterization was achieved easily. In 72% of cases, no physician from the primary team had made an attempt at catheterization. In such cases, standard catheterization was successful 66% of the time. Patients with identifiable urologic pathology by history represent the minority of consult requests. Indeed, catheterization was more likely to require advanced techniques in this group. In cases where no attempts were made prior to consultation (n = 8), all patients had a urologic history, although standard catheterization with a Foley or Coudé-tipped catheter was achieved in half of these patients by the urology resident.

Difficult urethral catheter placement is a multi-factorial problem. Operator-related factors are often inexperience or poor technique.[2] We showed that more consults are requested at the beginning of the academic year, when house staff are less experienced. Patient-related factors may represent a normal physiologic response, or may indicate pathology such as local edema, phimosis, urethral stricture, false passage, bladder neck contracture, benign prostatic hyperplasia or obstructing prostate malignancy.[3] Iatrogenic injury may result during urethral catheter placement. A recent single institution study documented 3.2 urethral catheter injuries per 1000 male patients.[4] Complications include urinary tract infection, injury to the urethra, bleeding and formation of strictures or false passages.[5]

Urologists have developed techniques to address difficult urethral catheter placement. Blind passage, using a filiform, guide wire or glide wire, has been described.[6] Direct visualization, either with flexible or rigid cystoscopy, is also commonly employed.[7,8] Placement of a suprapubic catheter is a viable approach when transurethral catheterization techniques are unsuccessful. Additionally, urology residents know to use larger Coudé-tipped catheters in the setting of BPH, and smaller catheters if urethral stricture is suspected, which may not be standard knowledge for non-urologists.

Based on our experience in this study, we have adopted an algorithm for the management of urethral catheter consults, Figure 3. Our data highlight the need for a thorough urologic history when patients are admitted to other services. Knowledge of prior radiation or urologic surgery could result in more appropriate consultation and fewer traumatic catheterizations, since these patients are more likely to require complex intervention by urologists. We believe that these results justify efforts to encourage a greater willingness on the part of primary service physicians to attempt catheterization in patients without complex urologic history before requesting the assistance of a urologist.

Our findings highlight the need for discussion as to whether the ability to perform an uncomplicated

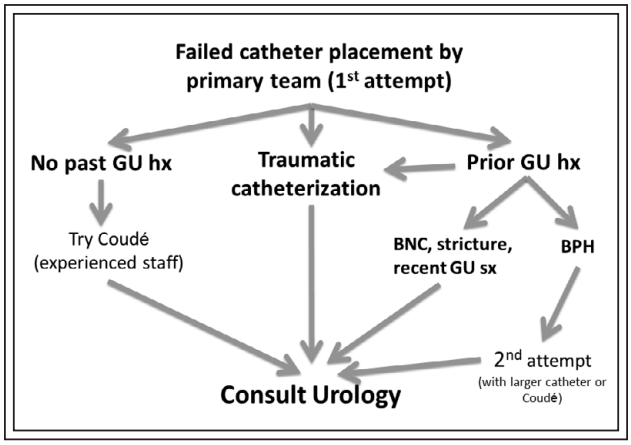

Figure 3. Proposed algorithm for difficult urethral catheter placement.

catheterization should be viewed as a standard competency among physicians who care for inpatients in acute-care hospitals. We believe that all nurses and physicians in this setting should receive training in proper technique for placement of not only standard Foley catheters, but Coudé catheters as well. Interestingly, the Accreditation Council for Graduate Medical Education (ACGME) does not list urethral catheterization as a procedural competency for residents in internal medicine or emergency medicine.[9,10] The ACGME does, however, require that internal medicine residents achieve competency in central venous and pulmonary artery lines, which are used much less frequently compared to urethral catheters in hospitalized patients.[11]

Encouraging the primary service to attempt a urethral catheter in appropriate patients without complex urologic pathology could avoid unnecessary urologic consultations, reduce cost, and improve efficiency of patient care. At our institution, all incoming interns view a presentation of this algorithm and a video with focused instructions on how to insert a standard Foley and Coudé catheter. We believe that education of non-urology personnel could reduce the number of consultations to the urology service and also increase patient safety. The ACGME should require internal medicine and emergency medicine programs to train their residents in urethral catheterization as a standard competency. Additionally, urologists can perform in-service training to physicians and nurses to increase their knowledge of urethral catheterization. Finally, non-urologist physicians should seek assistance from experienced staff such as urology nurses when they are having difficulty with catheter placement or if they do not feel comfortable with placement.

Although the data were collected prospectively, data collection could be subject to reporting bias. Furthermore, the data from the PAVA does not represent all consults as only those covered by the urology residents were recorded, and the urology service at the PAVA was also covered by general surgery residents during the study period.

The number of consults from SCVMC was the lowest of the three institutions although it is comparable in size to the others (574 beds compared to 477 at SHC and 900 at PAVA), which may be the result of a formal policy where a physician from the primary team attempts catheterization prior to a urology consult if a nurse is unsuccessful. The modest sample size precluded subgroup analyses by urologic pathology or by specific urologic procedure (e.g. suprapubic tube placement).

Conclusions

Urethral catheterization is common in hospitalized patients. The majority of 'difficult catheterizations' can be successfully handled with proper technique and standard Foley or Coudé catheterization. We propose that all nurses and medical doctors receive training and demonstrate competency in placement of standard Foley and Coudé catheters, and that algorithms be instituted to optimize the delivery of safe and efficient care to patients who require catheterization. □

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