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The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

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Iatrogenic bladder neck rupture due to traumatic urethral catheterization: A case report

Ozgur Ekici, Ercüment Keskin, Fatih Kocoglu, Ali Seydi Bozkurt

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Abstract

BACKGROUND

In this article, we present a case of iatrogenic bladder neck rupture due to catheter insertion in a 94-year-old comorbid male patient.

CASE SUMMARY

The patient, who had a urethral catheter inserted in the palliative service 3 d ago, was consulted because the catheter did not work. Because the fluid given to the bladder could not be recovered, computed tomography was performed, which revealed that the catheter had passed the bladder neck first into the retrovesical area then into the intraabdominal area. The appearance of the anterior urethra and verumontanum was normal at cystoscopy. However, extremely severe stenosis of the bladder neck, and perforated posterior wall of the urethral segment between the prostatic urethra and the bladder neck were observed. Internal urethrotomy was applied to the bladder neck with a urethrotome. An urethral catheter was sent over the guide wire into the bladder. The patient was followed in the palliative care service and the catheter was removed 7 d later. No extravasation was observed in the control urethrography.

CONCLUSION

Although catheter insertion is a simple and frequently performed procedure in hospitalized patients, it is necessary to avoid unnecessary extra-indication catheter insertion.

Key Words: Bladder neck rupture; Urethral catheterization; Iatrogenic; Extravasation; False route; Case report

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Core Tip: False routes developed during urethral catheterization may lead to perforation of the urethra. In comorbid and elderly male patients, this may go so far as to impair the general condition of the patient. Unnecessary and off-label catheter insertion should be avoided and the catheter set should be made by experienced people. The case report that we presented is important in terms of exemplifying this situation.

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INTRODUCTION

Urethral catheterization is one of the most common procedures performed in hospitalized patients. Urethral catheterization is performed in 25% of hospitalized patients. The rates of urethral damage due to urethral catheterization in hospitalized male patients range from 1.3% to 3%[1]. Trauma usually develops as a result of inflation of the catheter balloon inside the urethra. In addition, previously created false passages or urethral strictures may also cause the urethral catheter to enter into false passages.

Urethral catheterization is not often performed under the supervision of a urologist. Most of the time, this procedure is performed by allied health personnel[2]. Subsequently, the catheter balloon is inflated in the wrong locations such as inside the urethra or very rarely in the ureter, and it can lead to serious morbidities. Urethral injuries due to urethral catheterization are preventable with simple training.

Cases of iatrogenic urethra and ureteral injuries due to catheterization have been published in the literature as case reports[3-5]. In this paper, we present a case of iatrogenic bladder neck rupture following urethral catheterization in a male patient followed in the palliative care service.

CASE PRESENTATION

Chief complaints

A 94-year-old male patient who were diagnosed with coronary artery disease, diabetes mellitus, and chronic obstructive pulmonary disease and followed in the palliative care service was consulted to our clinic due to the fact that the urethral catheter was not draining urine.

History of present illness

The urethral catheter which was inserted in the palliative care service 3 d ago, was checked by us. Sterile isotonic fluid given to the bladder for control purposes could not be recovered. Therefore, ultrasonography was performed on the patient by our clinic to detect the location of the urethral catheter balloon. Catheter balloon was not observed inside the bladder. Thereupon, non-contrast abdominal computed tomography was performed.

History of past illness

The patient had no pertinent past illness history.

Personal and family history

The patient had no pertinent personal or family history.

Physical examination

No physical examinations were performed.

Laboratory examinations

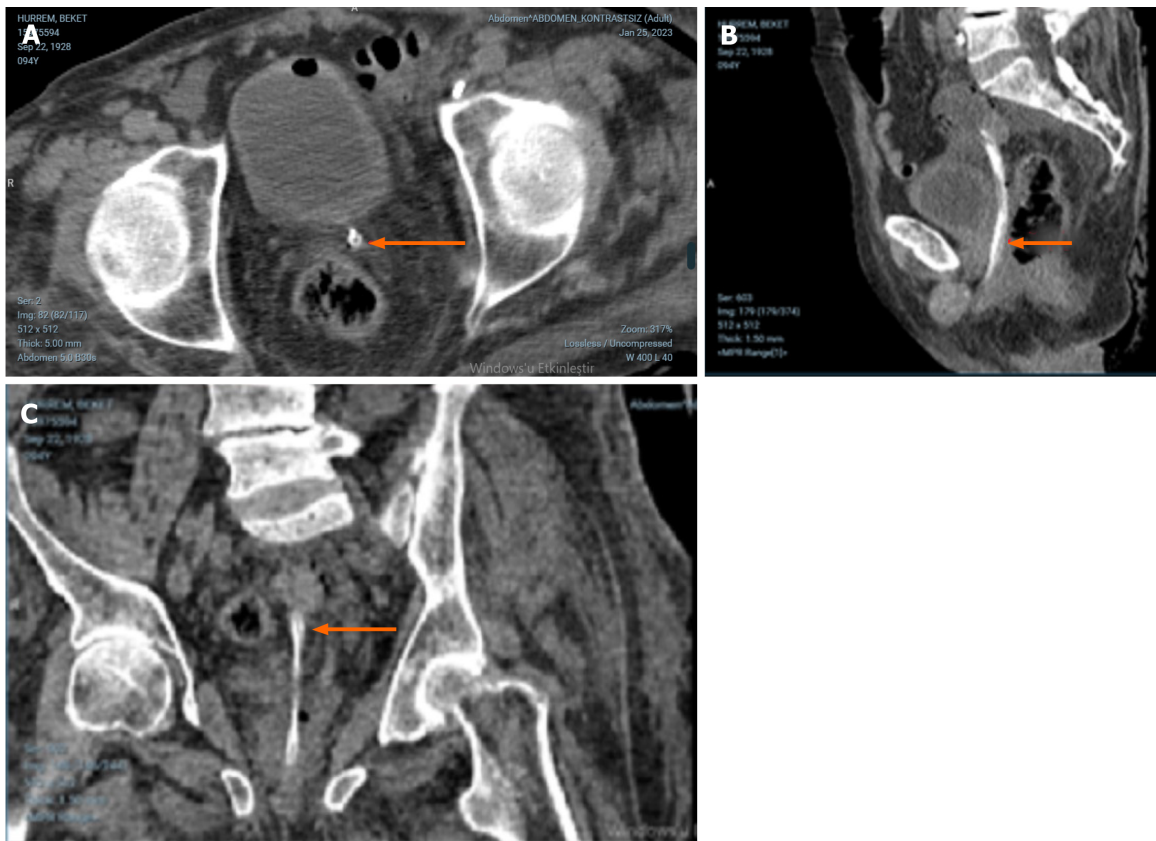
No laboratory examinations were performed.

Imaging examinations

Computed tomography revealed that the catheter had passed the bladder neck first into the retrovesical area then into the intraabdominal area (Figures 1A-C). Then, a decision to perform cystourethroscopy was made.

Further diagnostic work-up

Cystourethroscopy was performed under local anesthesia with the patient in the lithotomy position. The appearance of the anterior urethra and verumontanum was normal. However, extremely severe stenosis of the bladder neck, and perforated posterior wall of the urethral segment between the prostatic urethra and the bladder neck were observed.



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Figure 1 Hyperdense urethral catheter visible posterior to the bladder. A: Axial section; B: Coronal section; C: Sagittal section.

Internal urethrotomy was applied to the bladder neck with a urethrotome. The bladder was edematous and the orifices were normal. The perforated area was bypassed with a guide wire, and then an urethral catheter was sent over the guide wire into the bladder. No deficit was observed during bladder irrigation.

FINAL DIAGNOSIS

Taking into consideration the clinical symptoms, the absence of medical history, and the imaging and cystourethroscopy findings, a final diagnosis of spontaneous urethral rupture was made.

TREATMENT

The perforated area was bypassed with a guide wire, and then an urethral catheter was sent over the guide wire into the bladder. No deficit was observed during bladder irrigation.

OUTCOME AND FOLLOW-UP

The patient was followed in the palliative care service and the catheter was removed 7 d later. No extravasation was observed in the control urethrography. He was discharged with complete recovery. Written informed consent was obtained from the patient.

DISCUSSION

The vast majority of posterior urethral injuries are associated with pelvic bone fractures. Iatrogenic posterior urethral injuries usually result from inflation of the catheter balloon inside the prostatic urethra. It is also known that patients with impaired mental functions, may try to remove the urethral catheter without deflating the catheter balloon without the knowledge of the healthcare personnel[3]. As a result, urethral pressure increases and urethral mucosal rupture or deta-

chment may develop. However, cases of spontaneous rupture of the urethra without any prior urethral trauma have been rarely reported. The case that we have presented is important because the catheter inserted in a male patient with no previous trauma history perforated the urethra from the posterior urethra/bladder neck junction and migrated into the retrovesical area and then into the intraabdominal area.

In the case that we have just presented, the inability to recover the fluid instilled into the bladder made suspect that the urethral catheter was not inside the bladder. As it is known, after insertion of the urethral catheter, it should be advanced into the bladder until the catheter balloon is passed fully beyond the bladder neck. Afterwards the balloon should be inflated after drainage of urine is seen. If the bladder is empty, urine may not come out. In this case, the bladder should be irrigated and recovery of almost all of the given fluid should be observed[6]. If almost all of the fluid delivered cannot be recovered, then the location of the catheter should arouse suspicion. If it is difficult to irrigate the bladder, then it is possible that the catheter balloon has not passed fully into the bladder and it is inside the prostatic urethra. In this case, the catheter balloon should never be inflated. In the case that we presented, there was no known prior history of urethral trauma. However, in the authors' opinion, if the urethral catheterization was attempted by inexperienced people and the balloon was inflated inside the urethra without advancing the catheter into the bladder, this procedure may have caused urethral rupture and a second attempt at urethral catheterization may worsen this condition, leading to urethral perforation. If there is difficulty in advancing the inserted catheter into the bladder, the catheter may be in the false passage. In this case, it is necessary to avoid the second and subsequent attempts at catheterization and the catheter should be inserted under direct vision.

Urethral catheterization is frequently applied by non-physician allied health personnel in clinical practice. Although it may appear to be a simple procedure, it can lead to annoying results, especially in male patients with a long and curved urethra, if it is not inserted in accordance with the above-mentioned principles[7]. Catheterization-related urethral traumas can lead to urethrorrhagia, urinary tract infection, ecchymosis in the penis, hematoma in the bladder, and hemoglobinuria in the short term. In the long term, it may present with urethral stenosis, erectile dysfunction, and urinary incontinence. Davis *et al*[1] followed 37 patients with catheterization-related urethral injuries for an average of 37 mo in their prospective study. They found that urethral stricture detected based on radiological or cystoscopic evidence developed in 78% of patients during the follow-up period. Catheterization without proper medical indication should be avoided irrespective of its ensuing traumatic outcomes.

If urine output is desired to be monitored in conscious patients with spontaneous micturition ability, trial of less invasive methods (use of a condom catheter, *etc.*) should be preferred[8]. Traumatic urethral catheterization is associated with increased morbidity, longer hospital stay, and higher expenditures. Bhatt *et al*[9] examined the urethral catheterization-related traumas developing during a 6-mo follow-up period in terms of procedural cost. The economic burden of 13 urethral traumas occurring during 6 mo had been calculated as approximately 50000 euros. In another study, acute management of complications over a 6-mo period costed 335337 euros[10]. Some studies have shown that training on urethral catheterization given to nurses and physicians who have just started the profession can reduce catheterization-related traumas. Kashefi *et al*[2] gave a visual and intensive training to the nurses about insertion of a catheter, and found that catheterization-related urethral injuries after this training sessions showed a 5-fold reduction compared to the baseline. In addition, the rate of trauma can be reduced with the use of catheters with a safer balloon mechanism that can be developed in the future[11].

Kiliç *et al*[3] reported a case of iatrogenic membranous urethral rupture in a patient hospitalized in the orthopedics clinic due to multiple pelvic bone fractures. In this case, the patient wanted to remove the inserted catheter himself, and when he could not remove it, he cut the catheter at the level of the external meatus. Then the proximal part of the catheter migrated back into the bladder. Physicians who were not aware of this situation wanted to insert a new catheter, and it was thought that urethral rupture developed possibly as a result of inflating the balloon of the new catheter in the membranous urethra, and the presence of a remnant of the previously inserted catheter. In their case, pelvic abscess developed as a result of urethral rupture[3].

Case reports of incorrect positioning of the urethral catheter have been cited in the literature. Löcherbach *et al*[4] reported a case of ureteral injury caused by insertion of the catheter into the ureter and inflating its balloon after ureterorenoscopy. Similarly, Kim and Park[5] presented the case of a 38-year-old paraplegic female patient, where the catheter was inserted into the right ureter after routine catheter exchange. In this case, the ureteral injury was left to heal by placing a nephrostomy tube. In the presence of genital infections such as Fournier's gangrene, extra care should be taken during the catheterization procedure. Sihombing *et al*[12] published the case of a male patient who had genital infection and a long-term indwelling catheter whose general health condition worsened after replacement of his urethral catheter. In their case, false passage of the catheter was manifested by purulent scrotal swelling. In the scrotal ultrasonography, the catheter balloon was seen in the scrotum. After the operation, the patient died due to sepsis. In the case that we have just presented, rupture of the bladder neck was detected, and the case was intervened at an early stage. Complications were treated successfully without any septic sequelae.

CONCLUSION

Urethral catheterization without proper medical indication should be avoided in hospitalized patients. If there is any doubt about the position of the catheter after its insertion, a second attempt at catheterization should be avoided and a urology consultation should be requested without delay.

FOOTNOTES

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