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Case Report

Inadvertent placement of a urinary catheter into the ureter: A report of 3 cases and a review of the literature

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Abstract We describe three cases of inadvertent placement of the urinary catheter into the ureter. An 85-year-old gentleman on long-term IDC for neurogenic bladder presented with fever and right flank pain. CT of abdomen and pelvis demonstrated the tip of the IDC to be located within the right vesicoureteric junction with acute right hydronephrosis and acute pyelonephritis. A 74-year-old woman, on long-term IDC for neurogenic bladder was found to have hydronephrosis on ultrasound imaging. Contrast-enhanced CT intravenous pyelography done subsequently showed the IDC was in the right distal ureter. A 47-year-old lady, on IDC for urinary retention and voiding dysfunction likely secondary to schizophrenia and anti-psychotic medications, presented with raised creatinine. A non-enhanced CT abdomen and showed that the tip of the urethral IDC was located up to the left vesicoureteric junction. In all patients, the hydronephrosis resolved after changing the catheter and they were well on discharge. We also review the literature to identify the incidence, outcomes and possible risk factors. To our knowledge, only 20 cases have been reported thus far in the English literature. Although serious complications can occur, the incidence is very low. One risk factor that has been identified is long-term catheterization in patients with neurogenic bladder. We do not recommend routine imaging after catheterization in this group of patients. However, we should still be mindful of the possibility of this occurrence and evaluate and treat as necessary when clinical suspicion arises.

1. Introduction

Insertion of urinary catheters, either indwelling urethral catheters (IDC) or supra-pubic catheters (SPC), is among

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the most common urological clinical procedures performed. In the majority of cases, this is uneventful with the tip and the balloon of catheter residing within the urinary bladder. Inadvertent placement of the urinary catheter into the ureter is a rare but possible occurrence and may cause complications such as ureteric obstruction with hydronephrosis, ureteric injury or even ureteric rupture.

The purpose of this paper is to describe three such cases encountered in our institution; to review the literature, to suggest the possible reasons for this rare occurrence and to suggest measures to prevent this.

2. Case report

2.1. Case 1

An 85-year-old Malay gentleman, with a past medical history of hypertension, hyperlipidaemia & chronic obstructive pulmonary disease (COPD); on long-term urethral catheter for neurogenic bladder secondary to cystic schwannoma at the L2/L3 level, presented with acute onset of high grade fever, chills and right flank pain. He had his catheter changed by a nurse at the nursing home 2 days prior to presentation.

Contrast-enhanced computer tomographic scan of his abdomen and pelvis (CT AP) demonstrated the tip of the urethral catheter to be located within the right vesicoureteric junction (VUJ) and obstructing it with resultant acute right hydronephrosis and hydroureter (Figs. 1 and 2). The right kidney was also noted to be bulky and showed multiple non-enhancing areas with perinephric fat stranding suggestive of acute pyelonephritis.

The aberrantly placed catheter was removed and a new Foley catheter was reinserted. He was treated with intravenous Aztreonam based on positive blood and urine cultures which grew *Klebsiella pneumoniae*. The patient was discharged after completion of 14 days of antibiotics with resolution of all symptoms.

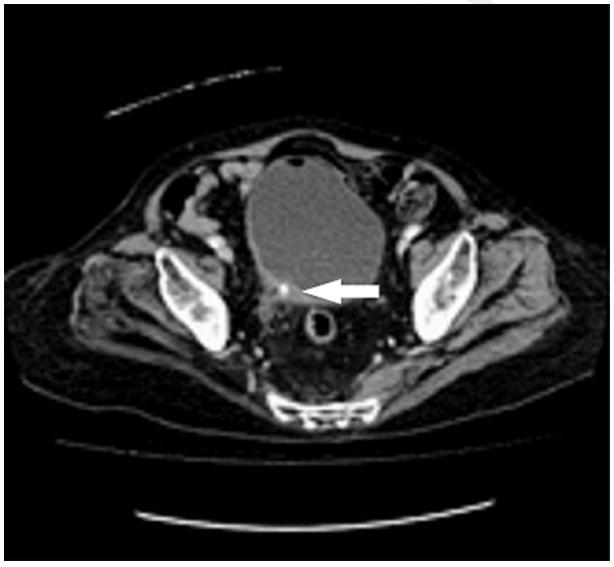

Figure 1 CT scan, cross section: the tip of the vesicoureteric catheter within the right vesicoureteric junction.

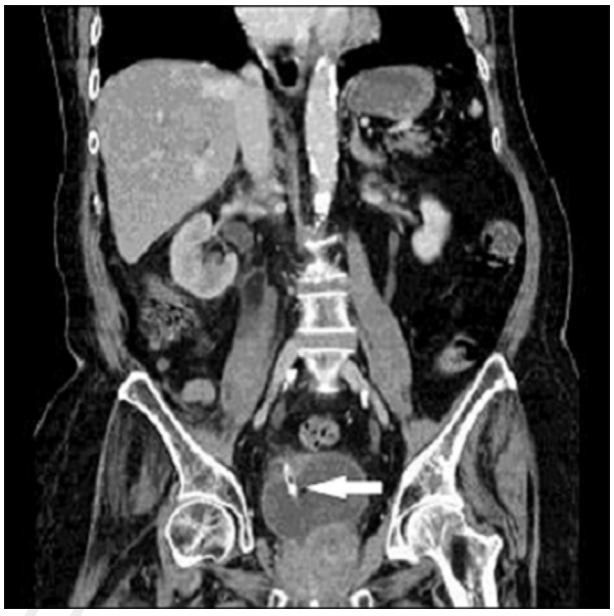

Figure 2 CT scan coronal view: the tip of the catheter within right vesicoureteric junction.

Nine months after this episode, the patient presented at our institution with the complaint of no urine output from urethral IDC. Ultrasound of his kidneys and bladder was performed and showed that the tip of the catheter was within the right VUJ again (Fig. 3). A new catheter was placed but the tip was found to still lie within the right ureter 2 days after insertion. The urethral catheter was then removed and the patient was taught clean intermittent catheterization (CIC).

2.2. Case 2

A 74-year-old Chinese woman, with a past medical history of hypertension and uterine cancer status post hysterectomy and radiotherapy; on long-term urethral IDC for detrusor underactivity following radiotherapy, was admitted to our institution following a fall. An ultrasound (US) scan of her abdomen, which was performed for investigation of transaminitis, showed incidental bilateral hydronephrosis. Contrast-enhanced CT intravenous pyelography (CT IVP) showed right hydronephrosis and hydroureter secondary to obstruction from the tip of the urethral catheter which had be placed in the right distal ureter. Her IDC was removed and she was able to void with minimal residual urine.

She was subsequently transferred to the medical intensive care unit (MICU) in view of desaturation secondary to hospital acquired pneumonia and required intubation and ventilatory support. During her stay in the MICU, a urethral IDC was inserted for monitoring of her urine output. However, no output was noted from the newly inserted IDC. A non-contrast CT scan of her abdomen and pelvis was done and showed the urinary catheter with its inflated balloon and tip to be located in the right mid-ureter again with

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