Misplaced Nephrostomy Catheter in Left Renal Vein: A Case Report of an Uncommon Complication Following Percutaneous Nephrolithotomy

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INTRODUCTION

In 1941 Rupel and Brown used a rigid cystoscope to extract the residual stones through a drain tract following open surgery.[1] That was the beginning idea of endoscopic renal surgery. L shaped endoscopes were used for visualizing calyceal stones during open procedures. The percutaneous nephrostomy was described by Goodwin in 1955 as a temporary solution for obstruction secondary hydronephrotic patients.[2] Finally, Fernstrom and Johansson performed percutaneous nephrolithotomy (PCNL) successfully in three patients in 1976.[3] Although PCNL is a safe and effective procedure which improves by experience and technology, complications may occur as the procedure in essence is controlled renal trauma. Here, we report an uncommon PCNL complication and our management.

CASE REPORT

A 48 years old male who had previously undergone a left open nephrolithotomy 5 years prior underwent a left PCNL. Pre-operative hemoglobin level was 15.2 g/dL. The stones were in the renal pelvis and inferior pole of the kidney. An 18 gauge, 2 piece entry needle was advanced

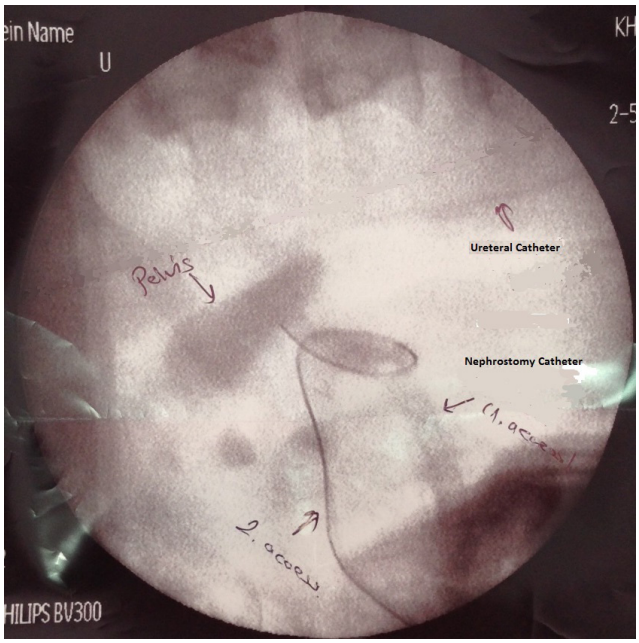

Figure 1. Antegrade nephrostography demonstrates the filling in both inferior calyx and renal pelvis with no contrast extravasation.

in a straight pathway into the mid pole calyx, another access to posterior inferior calyx was achieved and guidewires were placed. Dilatation of the tract was achieved by using 8 French (F) co-axial and 30F Amplatz dilator set over the guidewire. Bleeding was moderate but renal pelvis was not accessible due to infundibular obstruction of the mid pole calyx, possibly because of the previous nephrolithotomy operation. During the procedure, stones were not visible and the bleeding became severe which led to interruption of the procedure, and a nephrostomy tube was inserted to control bleeding. In order to check intraoperatively if nephrostomy tube was in the right place or not, an antegrade nephrostography was performed and it showed the filling in both inferior calyx and renal pelvis with no contrast extravasation. In addition to that, any additional extravasation suggesting an additional venous or arterial injury was not detected (Figure 1). As a routine application, the nephrostomy tube was opened three hours after the procedure and there was no bleeding and post-operative hemoglobin level was 12.8 g/dL. On the seventh hour postoperatively, severe bleeding from the nephrostomy tube was noted, the blood pressure was decreased to unmeasurable levels and hemoglobin level was 6.4 g/dL. After 3 units of blood transfusion

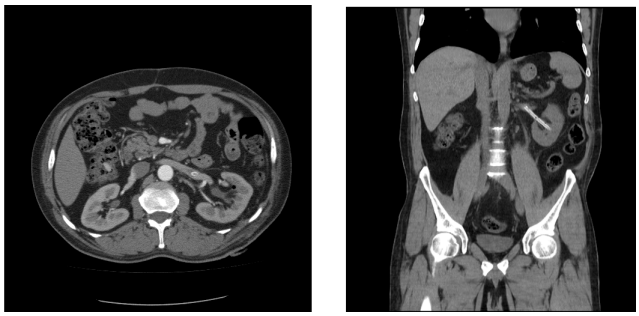

Figure 2. Contrast enhanced computer tomography scan shows that the nephrostomy catheter is inside the left renal vein.

and appropriate fluid replacement, vital signs of the patient were stabilized and hemoglobin level was increased to 9.1 gr/dL. First postoperative day a contrast enhanced computer tomography (CT) scan was performed and displayed that the nephrostomy catheter was inside the left renal vein (Figure 2). After the patient became hemodynamically stable, the nephrostomy catheter was removed by open surgery under general anesthesia by the vascular surgeon in the operation team. No hemorrhage occurred after nephrostomy tube was removed, and hemodynamics was stable during the operation. Eventually, a silicone drain was placed into the retroperitoneal space. The drain was removed two days after the operation and the patient was discharged four on the fourth day postoperatively, and neither hemodynamic instability nor hematocrit level decrease was observed. The stones that have remained in the patient were removed by the 2nd PCNL operation one month later without any complication observed, hence the patient became stone-free.

DISCUSSION

Today, PCNL is the frequently preferred option for the treatment of inferior calyx stones and large multiple stones.[4] Renal hemorrhage is the most common complication of percutaneous renal surgery but hemorrhage which needs intervention is a rare complication.[5] In the literature, various rates from 0.6% to 23.8% have been reported regarding transfusion rates.[6] Sepsis, intestinal injury, pleural injury, adjacent organ injury and extravasation are other complications of percutaneous renal surgery.[7]

Nephrostomy tube placement is a routine procedure following percutaneous renal surgery. Major renal vascular

complications which are recognized during the operation can be resolved by the placement by placing a nephrostomy tube under the guidance of a fluoroscopy, without open surgery.[8] Although tube placement is an effective method to control venous bleeding, smaller size nephrostomy tube placement or tubeless procedures are being used for better patient comfort.[9,10]

Our study is the third report in the literature regarding misplacement of nephrostomy tube into the vascular system and the second report of a complication following PCNL.[1-11] In our case, an antegrade nephrostography was performed after placement of the nephrostomy tube but showed no extravasation to renal vein. On the seventh hours postoperatively, severe bleeding through the nephrostomy tube has occurred following inappropriate mobilization of the patient, and the tube was re-clamped in order to control the bleeding and the patient was immobilized. A contrast enhanced computer tomography was performed on the first day postoperatively and the misplacement of the nephrostomy tube was detected, which should be the result of an unrecognized preoperative injury caused by an inadvertent Amplatz dilatation or an inappropriate mobilization of the patient. We performed open surgery unlike other cases in the literature because of the patient's choice and the legal restrictions about malpractice. The patient was discharged on the fourth day postoperatively without any complication. In our PCNL practices, we routinely verify the placement of the nephrostomy tube intraoperatively by antegrade nephrostography without fail after placing nephrostomy tube and check whether there is any extravasation or not. We think that this is a compulsory procedure. The migration of the nephrostomy tube should have occurred if severe bleeding is observed postoperatively, and an attentive control with computer tomography imaging following appropriate management of hemorrhage is essential.

CONCLUSION

It is strongly recommended that in case of misplacement of the tube the manipulation of the nephrostomy catheter should be handled under fluoroscopy guidance while the surgical team is ready to intervene.

CONFLICT OF INTEREST

None declared.

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