

A Rare Complication of Percutaneous Nephrostomy

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Abstract: Percutaneous nephrostomy is done for either diagnostic or therapeutic indications. Common therapeutic indication is to drain an obstructed upper urinary tract. It can be done under local anaesthesia with image guidance. In spite of being a very safe procedure, it has got some complications like haemorrhage, sepsis, dislodgement of catheter, pneumothorax etc.

A patient visited our emergency department with a closed catheter on his back. On exploration it was found to be draining fresh blood. Someone tried percutaneous nephrostomy outside. The patient was hemodynamically stable. Fluoroscopic examination showed the catheter tip coiled inside the inferior venacava. There was no extra-vasation of contrast. On exploration the catheter was found inside the venous system. It came out of the left renal hilum through a renal vein branch. Then went up to inferior venacava, traversing through the left renal vein. After taking proper vascular control the catheter was pulled from outside until the catheter tip coiled inside the middle calyx. No bleeding found at the hilum. After literature review we found it to be a very rare complication of percutaneous nephrostomy. So it should be kept in mind during performing the procedure.

Keywords: percutaneous nephrostomy; complication ; inferior venacava

I. Introduction

A percutaneous nephrostomy is a procedure to introduce a small flexible tube into the kidney through the skin. It is done for either diagnostic or therapeutic indications. Diagnostic indication of percutaneous nephrostomy is to perform Whitaker test. Common therapeutic indication is to drain an obstructed upper urinary tract. First therapeutic percutaneous nephrostomy done by Thomas Hillier (1865). It can be done under local anaesthesia with image guidance, commonly ultrasonography or fluoroscopy. Percutaneous nephrostomy is a very safe procedure. According to the literature the success rate varies from 84 – 100% in different centres¹⁻⁴. Common complications are retroperitoneal haemorrhage, visceral injury, pleural injury etc. We received a patient of percutaneous nephrostomy with complication which deserves some attention. We have not found this sort of complication documented in literature.

Objective

The objective is to aware people about this rare complication.

Case Scenario

23yr old male patient of left sided nephroureterolithiasis attended our emergency department with a nephrostomy tube on left side of his back. He had a history of open pyelolithotomy on the same side 3yrs back. One impacted stone was obstructing the left upper ureter. Attempt of internal drainage was failed. So percutaneous nephrostomy was attempted and blood came out instead of urine. Patient was referred to our centre with Nephrostomy tube in situ.



Fig1. This is how the patient presented.

On aspiration, fresh blood came out through the catheter. So we suspected some retroperitoneal great vessel injury. Fluoroscopy was done. The catheter tip was seen to have crossed the vertebral column. With contrast, it seemed to have coiled inside the Inferior vena cava. No extra-vasation of contrast noted. The patient was hemodynamically stable with mild tachycardia. Though no extra-vasation of contrast was seen on fluoroscopy, we suspected some vascular injury. So, exploratory laparotomy was planned.



Fig2. Contrast flows upwards along the Inferior vena cava shown by arrow.

Abdomen was opened through midline incision. Inferior vena cava, left renal vein up to renal hilum were dissected. Pigtail catheter was palpated inside the Inferior vena cava. The catheter traced up to the hilum. It was inside the renal vein and one of its branches. The catheter came out through a renal vein branch from the kidney and reached the Inferior vena cava through left renal vein.

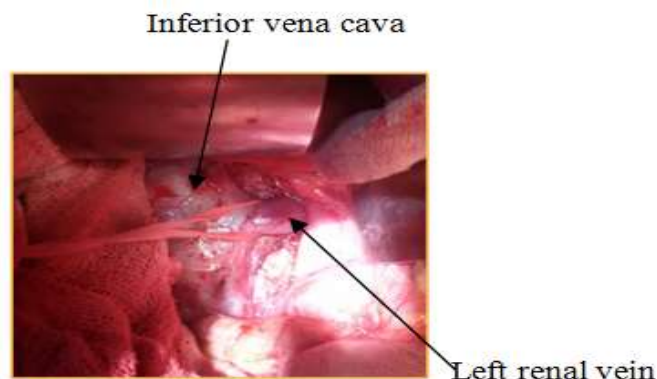


Fig3. Inferior vena cava & Left renal vein dissected.

Catheter not visible in the operative field.

After taking proper vascular control, we pulled the catheter from outside under fluoroscopic guidance until it coiled inside the middle calyx. There was no bleeding at the hilum after the procedure. We fixed the catheter to act as a nephrostomy tube.



Fig 4. Finally We Put The Catheter Inside The Middle Calyx.

Abdomen was closed after putting a drain. Mild hematuria through the nephrostomy tube persisted for two days. It became clear on second post-op day. The patient had an uneventful recovery.

II. Discussion

We discussed the case to find out the cause of this complication. The puncture was done through the middle calyx. The course of the catheter indicates that the procedure must have done with guide wire. Otherwise more injury would have occurred. During insertion of the guide wire, the tip of the needle may have entered into a branch of renal vein inside the renal parenchyma. As the guide wire was introduced, it went into the venous system. Along the guide wire the catheter also went into the Inferior vena cava. As the guide wire entered the venous system inside the renal parenchyma, there was no injury outside in the retroperitoneum and no bleeding was seen at the hilum when we pulled out the catheter.

III. Conclusion

It is very important to do every step of the procedure under proper radiological guidance. After calyceal puncture the needle tip should be clearly visible inside a calyx and it should not move during insertion of the guide wire. While introducing the guide wire one should be very vigilant to see the wire coiling inside the calyx. The whole procedure should be done under proper expert guidance. Any confusion regarding the proper placement of the catheter should be made clear by fluoroscopy. So any institution doing percutaneous nephrostomy should have C-arm facility.

IV. Review of Literature

There are different types of complications documented in literature. With improvement in radiology the complication rate of percutaneous nephrostomy is very low. Incidence varies among different centres. The complication rate is approximately 10% for major and minor complications together and 4-5% for major complications only⁵. Common major complications like sepsis, haemorrhage requiring transfusion, vascular and bowel injury, plural violation etc. The society of Interventional Radiology Quality Improvement guidelines has set up threshold of major complications of percutaneous nephrostomy, like septic shock- 4%, septic shock in pyonephrosis cases- 10%, haemorrhage requiring transfusion- 4%, vascular injury requiring embolisation or nephrectomy- 1%, bowel injury <1%, plural complication 1% etc⁶⁻⁷.

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