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## Case Report

### Rare Complication of Percutaneous Nephrolithotomy: Nephrostomy Tube in Renal Vein and Inferior Vena Cava

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**ABSTRACT:** Percutaneous nephrolithotomy (PCNL) is considered as the gold standard treatment for renal stones > 2cm. We encountered a patient who underwent PCNL and inadvertently placement of percutaneous nephrostomy tube in the inferior vena cava through the left renal vein from the left Kidney. There was profuse bleeding during the procedure (PCNL), and the procedure was abandoned by placing a nephrostomy tube. PNT was removed after 04 days in two steps without any bleeding.

**KEYWORDS:** Percutaneous nephrolithotomy, Inferior vana, cava Renal vein

## INTRODUCTION

Fernstrom and Johansson 1976 introduced Percutaneous nephrolithotomy (PCNL)<sup>1</sup>. It is now considered as gold standard treatment for renal stone > 2cm. PCNL has a complication rate of 7%.<sup>2</sup> Putting of nephrostomy tube (PNT) is a common procedure after completion of PCNL. Inadvertent placement of (PNT) into the Ipsilateral vein or vena cava is very rare and can cause serious complications. If PNT is not carefully managed, it can cause venous perforation, leading to severe hemorrhage, embolism, and sepsis.<sup>2-6</sup>

## CASE REPORT

A 26-year heavy-built male underwent left PCL for staghorn renal stone at Medina Teaching Hospital FSD, Pakistan. The procedure had to be immediately terminated after dilatation and putting in Amplats sheath due to profuse venous bleeding. A PNT was placed to control bleeding. The patient remained hemodynamic- ally stable after the procedure. On the first post-operative day, X-ray

KUB and contrast study were performed, which showed the PTN traversing through the left renal parenchyma into the left renal vein and vena cava (Fig-I). The patient was kept under observation for any untoward incidence for the next 2-3 days, under broad-spectrum antibiotic cover.

On the 4th post-operative day, we retrieved the PNT under Fluoroscopic control till it reached the calyceal system. The recovery period was uneventful. On the 5th post-operative day, a contrast study was done, which indicated the presence of PNT in the calyceal system and the free flow of contrast into the bladder (Fig-II). observation for any complications and discharged on the next day. The patient was scheduled for the next PCNL after 03 months.

## DISCUSSION

Inadvertent and misplacement of PNT into the renal vein and inferior vena cava (IVC) is a very rare phenomenon. PNT can enter through renal parenchyma into the renal vein and /or slip into the inferior vena cava.<sup>7</sup> It has been reported in one case that PNT reached up to the atrium.<sup>8</sup> There are various reasons why this rare complication may occur. Misjudgment of the length of PNT or depth of the tube insertion is probably the main cause of this complication. Misplacement of PNT may be catastrophic and may lead to serious complications like severe hemorrhage, systemic infections and sepsis or embolism if not managed properly. On the 5th day, PNT was removed, and the patient was kept for another day under Previously Mazzucchi E et al has documented two cases of misplacement of nephrostomy tubes into the renal vein and IVC during Percutaneous nephrolithotomy.<sup>2</sup> The

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nephrostomy tube was removed at 48 and 72 hrs, respectively, and the surgical team was standby for emergency open surgery in case of uncontrolled



bleeding, however no bleeding was occurred. Chen et al. have published three cases with misplaced nephrostomy tubes.<sup>8</sup> Tubes were placed into the venous system during PCNL. They managed these  
**Figure 1: Nephrostomy tube inside the IVC**



**Figure 2: Nephrostomy Tubes in pelvis of kidney after removal from IVC and renal vein and contrast going into ureter and bladder**

patients with intravenous antibiotics and strict bed rest. Tube was removed in one step in one case. In two other patients, tubes were withdrawn up to the renal pelvis in the first step. Complete removal was done in the second step under close monitoring and clinically stable patients. The decision of single-step or two-step withdrawal was based on the level of placement of the tube in the venous system. The outcome of patients in these cases was eventless. Another study by Kotb et al and Tarhan et al.<sup>9,10</sup> removed the PNT by open surgery without hemorrhage.

In our case, we removed the PNT in two steps. In the first step, on the 4th post-operative day, we retrieved the PNT from the renal calyceal system and on the 5th post-operative day removed the tube under strict observation in the operation theatre with the surgical team standing by. According to our experience and literature review, a misplaced PNT can be removed in the early post-operative period without any hemorrhage, but the surgical team should be ready for any emergency surgical intervention.

## CONCLUSION

Malplacement of PNT in the venous system is very rare. It may lead to serious complications if managed improperly. PNT can be removed safely, however, team for potential surgical intervention should be ready during this removal procedure.

*Conflict of interest:* None

*There is no conflict of interest:* None

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***Author's Contribution***

<b>Muhammad Akram Malik &amp; Farhan Jamshed</b>	Reported case
<b>Adeen Akram , Marraym Anwar &amp; Asad Ramzan</b>	Compile all material and drafting of report
<b>All authors are equally responsible for integrity of material provided and case report</b>	

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