



# Incarceration of small bowel following percutaneous nephrostomy tube insertion

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## ARTICLE INFO

### Keywords:

Percutaneous nephrostomy

PCN

Bowel obstruction

## ABSTRACT

Percutaneous nephrostomy has become a well-established technique for providing permanent or temporary drainage of an obstructed urinary system for decades. Although it is generally considered a safe intervention, some complications might be life threatening. Here we present a case of bilateral nephrostomy insertion due to T-cell lymphoma, that presented with signs of bowel obstruction 3 weeks after intervention. Abdominal exploration showed bowel obstruction due to invagination of bowel loop between left nephrostomy tube and abdominal wall which resolved by release of bowel loop and changing nephrostomy route to pass through retroperitoneum only.

## 1. Introduction

Percutaneous nephrostomy (PCN) is used to provide permanent or temporary drainage of an obstructed urinary system. As an invasive procedure, it might have several complications, most of them resolve spontaneously.<sup>1</sup> Major complications have been reported to be around 5% e.g. sepsis or bleeding.<sup>2</sup> Bowel injury, although rare, has been reported either,<sup>3</sup> but it is almost exclusively happened during PCN insertion. Here, we provide a case report of a patient presented with bowel obstruction 3 weeks following PCN insertion with no signs of bowel injury immediately after PCN insertion.

## 2. Presentation case

A 66-year-old man, who was a known case of T-cell lymphoma, underwent bilateral PCN insertion from flanks due to retroperitoneal mass (cancer relapse after chemotherapy). 3 weeks following PCN insertion (10 days after his new chemotherapy session), he came to emergency department with abdominal pain and vomiting. He had gas passage but no defecation in the previous 5 days. Physical exam showed abdominal tenderness with distention. Rectum was empty on rectal examination. Both PCNs were functional. His serum creatinine level was normal while he had mild leukocytosis. CT scan showed dilated

bowel loops with air-fluid level; also, left nephrostomy tube seemed to be advanced through peritoneal cavity (Fig. 1).

With the impression of acute abdomen, the patient underwent abdominal exploration, where we found an intestinal loop incarcerated between abdominal wall and left nephrostomy tube. After removing nephrostomy tube and releasing bowel loop, its color turned into normal. Nephrostomy was inserted again while making sure it would stay in retroperitoneal cavity. He was discharged 4 days after surgery with normal defecation and urinary output from both nephrostomy tubes.

## 3. Discussion

After the first description of percutaneous nephrostomy (PCN) in 1955 by Goodwin et al.<sup>4</sup> it has become a well-established technique for providing permanent or temporary drainage of an obstructed urinary system. The overall complication rate of PCN is about 10% in the literature.<sup>2</sup> Bowel complications rate after PCN has been reported to be between 0.3% and 0.5,<sup>3</sup> which mostly happen in colon during the procedure of PCN insertion. While there has been reports of direct small bowel injury and obstruction during PCN insertion,<sup>5</sup> no small intestine invagination and obstruction due to nephrostomy has ever reported. We presume during PCN insertion, part of it passed through peritoneal

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<https://doi.org/10.1016/j.eucr.2022.102228>

Received 16 August 2022; Accepted 16 September 2022

Available online 16 September 2022

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**Fig. 1.** Abdominopelvic CT scan without contrast, showing dilated bowel loops with air-fluid levels and abnormally advanced nephrostomy tube through peritoneal cavity (red arrow). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

cavity. Thus, created a hazardous bottleneck for small intestine to invaginate and get stuck; same as incarcerated hernia (Fig. 2).

The reason for this passage of PCN might be related to the site of needle puncture.

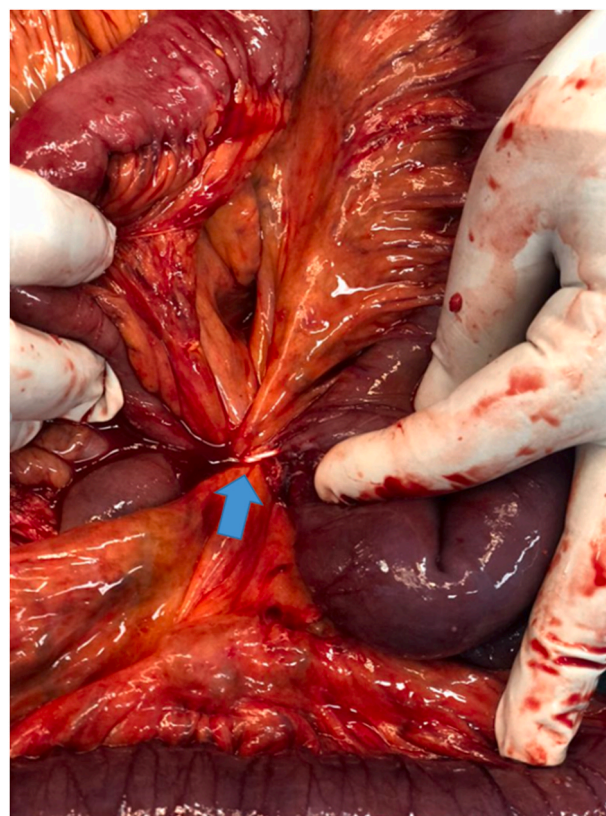
Sometimes, a PCN is inserted more anteriorly to decrease patient's pain while lying in supine position. Yet, physician must be aware that the more anteriorly the PCN is placed, the more risk it would have for passing through peritoneal cavity, creating a situation where small intestine might get incarcerated in (between abdominal wall and nephrostomy tube). We think if PCN was inserted nearer to midline in the back, the whole route of PCN would be in the retroperitoneal cavity, hence, limiting the chance of bowel invagination.

#### 4. Conclusion

While bowel complications of PCNs are low, we still have to be vigilant about them. Especially when PCN is inserted more anteriorly where it might traverse through peritoneal cavity.

#### Declaration of competing interest

None.



**Fig. 2.** Invaginated and congested small bowel loop between nephrostomy tube (blue arrow) and abdominal wall. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

#### Acknowledgments

None.

#### References

1. Yoo MJ, Bridwell RE, Inman BL, Henderson JD, Long B. Approach to nephrostomy tubes in the emergency department. *Am J Emerg Med.* 2021;50:592–596. <https://doi.org/10.1016/j.ajem.2021.09.034>.
2. Hausegger KA, Portugaller HR. Percutaneous nephrostomy and antegrade ureteral stenting: technique—indications—complications. *Eur Radiol.* 2006;16(9):2016–2030. <https://doi.org/10.1007/s00330-005-0136-7>.
3. El-Nahas AR, Shokeir AA, El-Assmy AM, et al. Colonic perforation during percutaneous nephrolithotomy: study of risk factors. *Urology.* 2006;67(5):937–941. <https://doi.org/10.1016/j.urol.2005.11.025>.
4. Goodwin WE. Percutaneous trocar (needle) nephrostomy in hydronephrosis. *J Am Med Assoc.* 1955;157(11):891. <https://doi.org/10.1001/jama.1955.02950280015005>.
5. Fanni VSS, de Oliveira Ramos L, Leite MC, Martins FUP, Júnior PRC, Lopes HE. Diagnosis and management of small intestinal injury due to percutaneous renal access. *Int Urol Nephrol.* 2021;53(5):869–873. <https://doi.org/10.1007/s11255-020-02726-1>.