

# Colonic Perforation Following Percutaneous Nephrolithotomy: Retrorenal Colon - A Case Report

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## Abstract

Colonic perforation is an unusual and serious complication of percutaneous nephrolithotomy. It can result in more complicated open exploration of the abdomen, involving colostomy construction. The necessity of a second operation for the closure of the colostomy causes financial and emotional burden on the patients and surgeons.

**Key words:** Computed tomography scan, Nephrostomy, Percutaneous, Retrorenal colon

## INTRODUCTION

Fernstrom and Johansson (1976) first reported the technique of creating a percutaneous tract specifically to remove a stone. Subsequent reports have established percutaneous nephrolithotomy (PCNL) as a routinely used technique to treat patients with large or otherwise complex calculi. PCNL is the gold standard for the elimination of large renal calculi<sup>[1,2]</sup> providing maximal stone-free rates with minimal trauma to the kidney and the surrounding tissues. PCNL offers a 78%–95% success rate in the treatment of kidney stones. However, the rate of major and minor complications related to the procedure is as high as 83%.<sup>[3]</sup> The major complication rate for PCNL varies between 1.1% and 7%,<sup>[4]</sup> despite improvements in endourologic equipment and the development of new treatment modalities such as mini-micro PCNL, supine PCNL, and laparoscopically assisted PCNL. Nonetheless, significant risks remain, including those of bowel perforation, pleural injury, and bleeding. Although injury to the retroperitoneal colon is rare, occurring in fewer than 1% of cases<sup>[5,6]</sup> classified as a Stage IVa complication on

Clavien-Dindo classification of surgical complications, the potential severity of this complication is such that a high index of suspicion and alertness for its signs and symptoms is essential during the post-operative period.

## CASE REPORT

An average built 65-year-old female patient reported to us with a complaint of the left flank pain on and off from 4 months, with surgical history of open pyelolithotomy 10 years back for the left renal calculus. On ultrasound, 25-mm calculus in the left renal pelvis with Grade 1 hydronephrosis was found. Intravenous pyelography was also done. All the laboratory investigations were within normal limits. After her symptoms were controlled with medications, she was planned for PCNL.

The patient was administered prophylactic antibiotics, and the left-sided PCNL was done in the prone position. Percutaneous access to the middle calyx was obtained under fluoroscopic vision. The left-sided subcostal puncture was done just lateral to the paraspinous muscles. The tract was dilated to 26 Fr in routine fashion without any suspicion of bowel injury. The stone was fragmented with lithotripter and removed with tricep forceps. A double J stent was placed antegrade and after hemostatic matrix was placed in the tract 24 Fr nephrostomy tube was placed in the tract. No leakage of feces through the tract or on the access sheath was seen. Postoperatively, all the blood investigations were within normal limits with no total leukocyte count (TLC)

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or differential leukocyte count (DLC) change observed from the pre-operative baseline. On post-operative day 1, the patient was started on orals, and on day 2, nephrostomy tube was removed and antiseptic dressing was done at the site. On post-operative day 3, the patient was planned to be discharged, but we found feculent smell coming from the patient, the dressing at nephrostomy was opened, and we found it soaked with fecal matter and saw feces coming out through nephrostomy site.

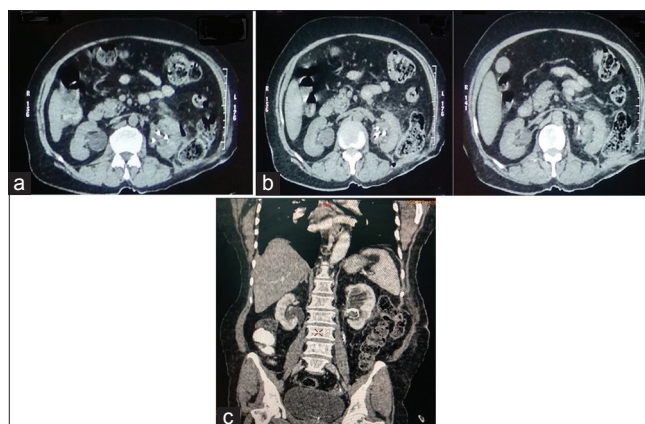
The patient was kept NPO and we placed a central venous catheter and started total parenteral nutrition (TPN). Broad-spectrum antibiotic coverage was provided (piperacillin-tazobactam + metronidazole + amikacin). Daily dressing was done both in morning and evening to quantify the output through nephrostomy site by a number of dressing pads soaked. Anal dilation was also done to give bowel rest. Contrast-enhanced computed tomography - abdomen was done which showed the left-sided retrorenal colon as shown in Figures 1 and 2 and an incidental finding of circumferential thickening involving cecum and part of the ascending colon. The patient was kept NPO for 7 days till there was no soakage from the nephrostomy site. Ultrasound of the abdomen was also done on post-operative day 7 to rule out any intra-abdominal collection. During the time, our patient did not develop fever nor there was rise in TLC or DLC. On day 8, the patient was started on orals and TPN was stopped. There was no leakage of fecal matter from the site, and subsequently, the patient also passed stools later. The patient was discharged; thereafter, double J stent was removed at 3 weeks from the date of surgery.

Established risk factors for the colonic injury during PCNL were as follows:

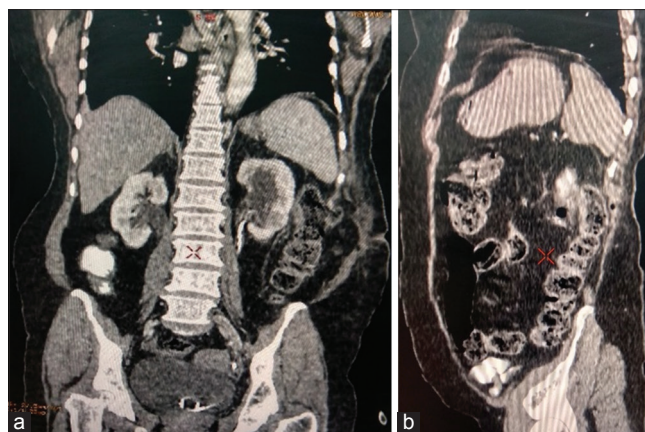
1. Slim body habitus.
2. Female sex.
3. Prior colonic or renal surgery.
4. Too lateral incision and access to lower pole.
5. Elderly patients with chronic constipation or other causes of colonic distension.
6. Anatomical anomalies such as horseshoe kidney.
7. Retrorenal colon.

Risk factors associated with our case were female sex with a previous history of left-sided open pyelolithotomy and retrorenal colon.

Recent reports describing bowel perforation during PCNL have emphasized the opportunity for conservative management for the bowel injury with replacing nephrostomy tube into the bowel lumen to act as a drain. However, in our case, we detected the injury after removal of the nephrostomy tube and managed



**Figure 1: (a-c) Left renal retrorenal colon with double J stent *in situ* in the left kidney and small fistulous tract communicating with the descending colon with air foci along the operative site**



**Figure 2: (a and b) Relation of the descending colon with the left kidney**

it conservatively. Prompt recognition of a colonic perforation is critical to limiting the serious infectious sequelae. Colonic perforation should be suspected if the patient develops unexplained fever or has intraoperative or immediate post-operative diarrhea, signs of peritonitis, gas, or feces through the nephrostomy tract. Unrecognized colonic injury can result in abscess formation, nephrocolic or colocutaneous fistulae, peritonitis, or sepsis.

## CONCLUSION

Retrorenal colon is more frequently found on the left side; therefore, accessing the left kidney risk of colonic injury should be considered during PCNL. We recommend that pre-operative CT scan should be obtained in high-risk patients to identify retrorenal colon to prevent unnecessary cost, morbidity, and mortality of the patients.

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