

CASE REPORT

Non-surgical resolution of colonic perforation with endoscopic clipping after PCNL

M. Ekanayaka¹, D.M.D.T. Dissanayake¹, H.W.T.D. Wijayarathna¹, M. Shivashankar², M.K. Herath¹, C. Keppetiyagama¹

¹National Hospital Kandy, Sri Lanka

²General Hospital Hambanthota, Sri Lanka

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Introduction

Colonic perforation following percutaneous nephrolithotomy (PCNL) is a rare but significant complication, [1] often presenting with pneumo-retroperitoneum and sometimes pneumomediastinum. This complication typically results from unintentional bowel injury, usually involving the descending colon when nephrostomy tracts are placed too medially [2]. Although traditional management involves open surgery, advances in endoscopic techniques have introduced less invasive alternatives. This case report illustrates the successful non-surgical resolution of colonic perforation using endoscopic clipping and conservative management, highlighting a novel approach that avoids the morbidity of surgical intervention.

Case Report

A 56-year-old female presented with left-sided nephrolithiasis. Preoperative imaging confirmed a large staghorn calculus in the left kidney, and PCNL was planned. The patient was positioned prone for the procedure, which was performed under fluoroscopic guidance. The procedure was uneventful, and the stone was successfully fragmented and extracted. She was discharged in stable condition on postoperative day one.

Two days later, the patient presented to the emergency department with complaints of left loin pain, distention, and mild chest pain. On examination, she was afebrile but had tachycardia with a heart rate of 110 beats per minute. Abdominal palpation revealed mild tenderness, especially in the left upper quadrant without features of peritonism and Inflammatory markers were elevated. (White cell count $1210^9/L$ and C-reactive protein 46 mg/L) Chest auscultation was normal, with no signs of respiratory distress.

Initial imaging, including a chest X-ray, revealed sub diaphragmatic free air suggestive of pneumoretroperitoneum

Correspondence: M. Ekanayaka

E-mail: imadhuekana@gmail.com

 <https://orcid.org/0009-0005-4621-3081>

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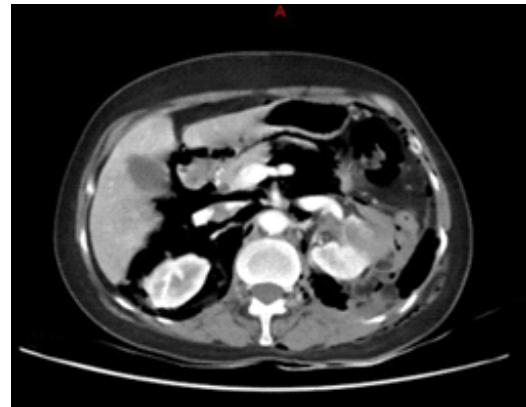


Figure 1: Pneumo-retroperitoneum and pneumomediastinum -CT images

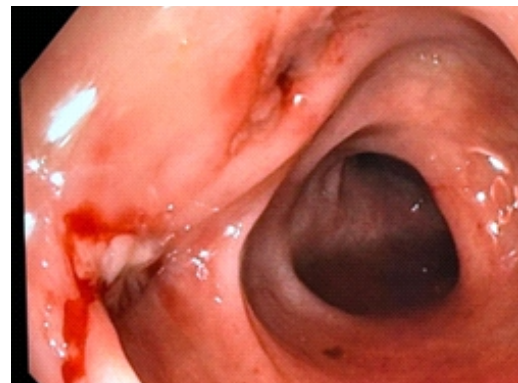


Figure 2 : Endoscopic images of the perforation



Figure 3 : Endoscopic images of the perforation (clips applied)

[3]. A subsequent non-contrast CT scan of the abdomen confirmed the presence of pneumo-retroperitoneum and

pneumomediastinum, raising suspicion of retroperitoneal colonic perforation (Figure 1) and the patient remained hemodynamically stable.

Given the suspected clinical diagnosis of colonic injury, sigmoidoscopy under sedation was performed with minimal low flow air insufflation, which identified a perforation in the descending colon near the splenic flexure, approximately 1 cm in size (Figure 2). The perforation sites were identified with its sloughy edges and tiny air bubbles popping out of it. The perforation was successfully closed with three through-the-scope endoscopic clips (TTS) (Figure 3). The patient was then managed conservatively with bowel rest, intravenous fluids, and broad-spectrum antibiotics (piperacillin-tazobactam). She was kept on nil per oral (NPO) status for 72 hours and closely monitored for any signs of deterioration.

Over the course of the next few days, the patient's symptoms improved significantly. Abdominal pain resolved, and follow-up imaging showed a reduction in pneumo-retroperitoneum. Oral feeding was gradually reintroduced on postoperative day six, and the patient tolerated this well. She was discharged on postoperative day ten, having made a full recovery.

Discussion

Colonic perforation is an infrequent but serious complication of PCNL, with an incidence ranging from 0.2% to 0.8% [3]. It occurs when the nephrostomy tract traverses the bowel wall, most commonly the descending colon due to its proximity to the left kidney. Pneumo-retroperitoneum and pneumomediastinum are radiological markers of such injury. Traditionally, colonic perforations following PCNL require surgical exploration, bowel resection, and anastomosis, [4] leading to increased patient morbidity, prolonged hospital stays, and higher healthcare costs.

In recent years, less invasive strategies have been explored, particularly for small perforations and stable patients. Conservative management of the bowel perforation has been described with percutaneous drainage and bowel rest, however endoscopic clipping allows direct closure of the perforation and avoiding open surgical intervention. This approach provides a definitive solution and avoids morbidity of an open procedure.

The endoscopic clipping during iatrogenic perforation in colonoscopies is well documented but its applications in post PCNL bowel injuries is less common.

However Early detection of the perforation and prompt endoscopic management were key to avoiding complications such as peritonitis or sepsis.

Our case highlights importance of multidisciplinary approach involving, surgical, gastroenterology, and radiology expertise in managing surgical complications and reducing its morbidity and mortality [5]. Minimally invasive treatment with endoscopic intervention should be considered in hemodynamically stable patients with small perforations.

Conclusion

This case report is the first documented instance of successful management of a colonic perforation following PCNL using only endoscopic clipping. The patient recovered completely. This experience suggests that selected cases of colonic perforation following PCNL can be managed with endoscopic techniques, offering a minimally invasive alternative to traditional open surgical management.

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Learning Points:

- Colonic perforation is a rare but dreaded complication of PCNL, usually requiring surgical intervention, with or without de-functioning procedures.
- Endoscopic clipping can be used as a minimally invasive alternative for managing colonic perforations, especially in stable patients with small perforations.
- Early recognition and prompt intervention can prevent the need for open surgery, reduce morbidity, and shorten hospital stays.
- A multidisciplinary approach involving urology, radiology and gastroenterology can optimize outcomes.