

# Colon perforation during percutaneous nephrolithotomy and fistula closure with Spongostan following conservative therapy

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## Abstract

Percutaneous nephrolithotomy (PCNL) is the first-line treatment for kidney stones. Colon perforation is a rare, but dangerous, complication. Colonic perforation might be very serious if it is not found early. After an unsuccessful extracorporeal shockwave lithotripsy, a 45-year-old female underwent a left-sided PCNL for two 1-cm kidney stones in the left kidney upper pole calyx. During dilatation, a colon perforation was suspected. The procedure was finished by inserting a 14Fr re-entry catheter into the colon. On postoperative day 5, a fluoroscopy was performed by injecting contrast dye through the re-entry catheter, which showed a fistula formation between skin and colon. The catheter was removed completely. A 16Fr external drainage catheter was inserted over the guidewire through the fistula tract. The fistula was closed by introducing prepared absorbable hemostatic gelatin powder (Spongostan) particles into the fistula tract through the catheter. Fistula tracks can be closed early by injecting absorbable Spongostan particles into the colonic fistula tract, thereby reducing inpatient time and increasing patient comfort.

## Introduction

Percutaneous nephrolithotomy (PCNL) is a safe and reliable method in kidney stone surgery.<sup>1</sup> However, even with more experience and technological advancements, complications are still frequent. Colon perforation is a rare, but dangerous, complication; its frequency occurs between 0.2% and 0.3% of the time.<sup>2,3</sup> Colonic perforation might have serious consequences if it is not diagnosed early.<sup>4</sup>

## Case report

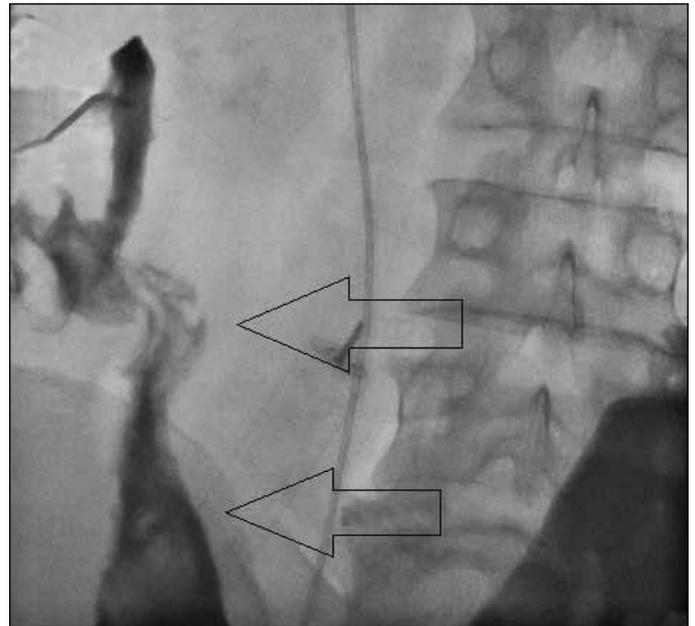
A 45-year-old female underwent a left-sided PCNL for two 1-cm kidney stones in the left kidney upper pole calyx after an unsuccessful extracorporeal shockwave lithotripsy. No

anomalies (renal anomaly, retrorenal colon) were found in the preoperative computed tomography (CT) review. The left ureter was catheterized and an 18-gauge access needle between the 11th and 12th rib was used to gain access into the upper pole. There was urine flow and the guidewire was inserted. Gradual dilation was performed using an Amplatz dilator up to 28Fr. As the Amplatz renal sheath was introduced into the kidney, a change in the position of guidewire was marked. When the guidewire was followed using a nephroscope, a colon perforation was suspected. The area was confirmed as colon after contrast matter injection. After we injected a retrograde pelviciceal contrast through the ureter catheter, we did not find contrast extravasation in the colon or intra/extraperitoneal area.

The procedure was finished by inserting a 14Fr re-entry catheter into the colon. The ureter catheter was withdrawn and a double-J stent was placed into the ureter. The patient began dual antibiotic therapy (ceftriaxone-metronidazole) and oral feeding was stopped for 72 hours. Intravenous hydration was added. After 72 hours, oral feeding resumed since there were no complications. On postoperative day 5, fluoroscopy was performed by injecting contrast dye through the re-entry catheter, which revealed a catheter in the colon (Fig. 1) and a fistula between the skin and colon (Fig. 2). A guidewire was inserted all the way to the colon through the catheter and then the catheter was removed completely. A 16Fr external drainage catheter was inserted over the guidewire through fistula tract. The fistula was closed by introducing prepared absorbable Spongostan particles into the fistula tract through the catheter. Using contrast dye, we closed the fistula (Fig. 3). The catheter was left proximal to the closed fistula track. After seeing no complications on postoperative day 7, the catheter in the fistula track was removed. The patient was discharged without complications. Antibiotic treatment was prolonged to 14 days after discharge. A double-J stent was removed on postoperative day 30 at which time, no anomalies were detected on CT.



**Fig. 1.** Visualization of the colon with a re-entry catheter, which is placed into colon.



**Fig. 2.** Visualization of the fistula tract between the skin and colon.

## Discussion

Even though PCNL is a minimally invasive procedure, there are still complications. The most frequent complications are bleeding, pain, and fever which are relatively easy to manage. Pneumothorax and solid organ injuries are rare but serious complications. Colon injuries are also rare complications with a high morbidity and mortality risk. The frequency



**Fig. 3.** Visualization of the fistula tract after closure by Spongostan.

is reported as 0.2% to 0.3%.<sup>3-5</sup> Risk factors were age, dilated collecting tubules, horseshoe kidney, and retrorenal colon.<sup>6-9</sup> In colon perforation cases, conservative management should be the first line of treatment. Colon and collecting tubules connection should be drained separately. Antibiotic therapy and ceasing oral feeding are recommended in these cases.<sup>7-10</sup> Lately, fibrin sealants are recommended in persistent nephrocutaneous fistulas.<sup>10,11</sup> Spongostan has been used for fistulas in the gastrointestinal system.<sup>12,13</sup> The mechanism of action of spongostan is supportive and mechanical.<sup>14</sup> Fistula tracks can be closed early by injecting absorbable Spongostan particles into the colonic fistula tract, therefore reducing inpatient time and increasing patient comfort.

## Conclusion

We think that closing the fistula tract by injecting Spongostan particles into the colonic fistula tract is effective and reliable.

**Competing interests:** The authors declare no competing financial or personal interests.

This paper has been peer-reviewed.

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