



Gallbladder injury after Percutaneous Nephrolithotomy: A case report

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ABSTRACT

Percutaneous Nephrolithotomy (PCNL) is the gold standard treatment of large kidney stones that has rare but serious complications such as gallbladder injury. In this article, a 62-year-old woman with a right lower kidney who was scheduled for PCNL was presented. The patient had acute abdomen on the first day after PCNL, so explorative laparotomy and cholecystectomy were done. The patient was discharged five days after surgery in good condition.

Section headings: Endourology/Stone Disease.

1. Introduction

Percutaneous Nephrolithotomy (PCNL) is the gold standard treatment for large kidney stones that has advantages such as short recovery time, a short length of stay in the hospital, small skin incision, and a high stone-free rate; however, it has some complications that might be life-threatening.¹ Gallbladder injury is one of the rare but serious complications that happened in some patients that have to be diagnosed and managed as fast as possible in order to save patients' lives.² A rare case of gallbladder perforation was described in this article.

2. Case report

A 62-year-old woman has been scheduled for PCNL because of a large right lower calyceal renal stone (Fig. 1). The patient is thin, and her body mass index (BMI) is 23 kg/m. She has not had any medical problems or surgical history. PCNL was performed under general anesthesia in the prone position. The first attempt to access the kidney failed because of the kinking guidewire during serial dilatation. The second attempt was successful, so the stone was fragmented and removed, and a nephrostomy was placed. Finally, the patient's position was changed, and a Double-J (DJ) stent was placed with a rigid cystoscope after an uneven PCNL. The patient's vital sign was stable at the end of surgery. The patient complained of abdominal pain and several episodes of vomiting after surgery. Physical examination revealed generalized abdominal tenderness and guarding. Their vital sign was stable; her

blood pressure was 100/70, and her pulse rate was 110/min. An abdominal X-Ray and Abdominal Computed Tomography (CT) scan without contrast were done (Fig. 2) which showed free fluid between bowels and no free air. A surgical consult was performed, and the patient was scheduled for laparotomy. Midline Laparotomy was done and a total of 500 CCs of yellow to green fluid was drained. Laparotomy exploration



Fig. 1. Large right lower calyceal renal stone.

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Fig. 2. Abdominal X-Ray (A) and Abdominal CT scan without contrast (B), after the PCNL surgery.

revealed a millimetric perforation site located almost adjacent to the liver bed and at the level of the intersection of gallbladder corpus and infundibulum, and that active intraperitoneal biliary leakage was present. After having confirmed that there was no other abdominal organ injury, cholecystectomy was performed. Bile contamination of peritoneal surfaces was minimalized with irrigation and aspiration of the abdomen with serum physiologic. Finally, three silicone drains that reached from the right paracolic area to the rectovesical space were placed. The patient was discharged on the fifth postoperative day without any problems.

3. Discussion

The most common complication after PCNL surgery is fever, which is about 21–40% of cases.² The rate of major complications is about 3.2–6.8%, which includes renal pseudoaneurysm requiring angioembolization, colon injury, and damage to the pleura.¹ Gallbladder perforation following PCNL is one of the rarest complications of PCNL, of which few cases have been reported so far. Gallbladder damage should be considered in lean patients after right PCNL surgery. Early diagnosis is important, so that delay in diagnosis and treatment can lead to death following biliary peritonitis.² Signs and symptoms that should be suspected following gallbladder damage include abdominal distension, abdominal pain, tenderness, and other peritoneal irritating symptoms.³ Both Contrast-enhanced CT scans of the abdomen and Magnetic resonance cholangiopancreatography (MRCP) are imaging techniques for the diagnosis of biliary tract injuries.⁴ If the biliary tract damage is confirmed, treatment can be performed with minimally invasive procedures such as endoscopic retrograde cholangiopancreatography (ERCP), but in cases where damage to the gallbladder happened, cholecystectomy is the preferred treatment. Cholecystectomy can be performed with open surgery or laparoscopy.³ In most reported cases, the diagnosis was made with a delay of at least 48 hours after injury.² In cases whose symptoms suggest peritonitis, the best approach is immediate explorative laparotomy, and conservative treatment is not recommended.⁵ The patient who presented in this article developed acute abdomen on the first day after PCNL, so we decided to do an explorative laparotomy, and we do not waste time doing sophisticated diagnostic imaging in order to save the patient's life.

4. Conclusion

Although gallbladder injury is rare during PCNL surgery, it should be considered in lean patients and in right-sided surgery. One of the causes of peritonitis after PCNL surgery can be gallbladder damage, which can lead to death if not treated promptly. In these cases, emergency laparotomy or laparoscopy should be performed.

Ethics

Patient informed consent was obtained to publish his information. The patient's private information remained confidential with the researchers.

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Roles

Amir Reza Abedi: Conceptualization, Methodology, Software, Visualization. **Niki Tadayon:** Writing- Reviewing and Editing, Data curation, Investigation. **Seyyed Ali Hojjati:** Supervision, Software, Validation, Writing- Original draft preparation.

Declaration of competing interest

The authors report no conflicts of interest in this work.

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