CASE REPORT

Chronic empyema thoracis after percutaneous nephrolithotomy

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SUMMARY

Percutaneous nephrolithotomy (PCNL) is presently the treatment of choice for large or multiple kidney stones or stones in the calyx. PCNL is generally safe and associated with low but indisputable complication rate. Pleural injury in PCNL is a rare but severe complication which can occur during or immediately after operation. Pleural injury may lead to chronic empyema thoracis. Until now no such case has been reported in literature.

BACKGROUND

Percutaneous nephrolithotomy (PCNL) is indicated for caliceal stones, large renal or ureteral stones and staghorn stones.¹ PCNL is generally safe and associated with low but indisputable complication rate.² Supracostal access is necessary in some cases but there is a high risk of pleural or lung injury. This may present as hydrothorax or pneumothorax. If infection reaches the pleural cavity, it can present as pyothorax. We report a case of a patient who developed chronic empyema thoracis as a consequence of complication of PCNL.

CASE PRESENTATION

A 45-year-old woman underwent PCNL for large staghorn calculi in the right kidney (figure 1). There was no history of respiratory symptoms or disease. The patient's preoperative parameters were within normal limits. The patient underwent PCNL and stones were extracted under spinal anaesthesia and a DJ stent was placed (figure 2). On the second post-operative day, the patient developed breathlessness; an X-ray of the chest was performed for the same, which showed massive pleural effusion on the right side (figure 3). The patient underwent repeated aspiration of the pleural fluid that relieved her symptoms to a great extent. The patient was discharged with prescription of oral antibiotics and advised to perform regular respiratory exercises. Three weeks later, the patient developed fever and tachycardia, with raised total leucocyte counts. The patient was referred to our hospital and we investigated her. Her X-ray of the chest and CT of the thorax showed a loculated collection in the right pleural cavity with surrounding pleural peel (figure 4). The pleural fluid aspirate was exudative in nature. We started intravenous antibiotics according to pus culture sensitivity. The pattern of fever changed, but did not completely subside.

We performed video-assisted thoracoscopic surgery (VATS)-guided decortication on the patient. During VATS, the peel that had developed around the loculated collection was removed along with all

Figure 1 Large staghorn calculi in the right pelvis.

the necrotic material, and an intercostal drainage (ICD) tube was placed in the right pleural cavity (figure 5).

Figure 2 Postoperative image showing DJ stent.

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Figure 3 Massive pleural effusion on the right side.

OUTCOME AND FOLLOW-UP

Postoperative period was uneventful, the ICD tube was removed on the sixth postoperative day. Postoperative X-ray showed full expansion of the lung (figure 6).

DISCUSSION

PCNL for upper urinary calculi is associated with fewer traumas to body functions. Its main advantage is rapid recovery, but it is associated with some complications such as bleeding, fluid

Figure 4 Loculated collection in the pleural cavity with peel.

Figure 5 Postoperative ICD tube in situ.

absorption causing haemodilution and chest injury. Chest injury is a relatively rare but major complication and includes pleural injury, pleural effusion and intercostal vascular injury.³

Factors which may be associated with increased chances of pleural injury are^{4 5}:

- ▶ Higher position of puncture point, that is, 10th intercostal space or above.
 - ▶ Prone position of the patient is associated with more injury to the pleural cavity.
 - ▶ Abnormal body weight along with prone position is associated with increased complications.
 - ▶ Repeated puncture increases chances of pleural injury.
- Measures to prevent chest complications are⁶⁻⁹:
- ▶ Preoperative and postoperative radiology of the chest.
 - ▶ The puncture site should be carefully assessed in relation to intercostal spaces.
 - ▶ On 12th rib puncture there is less chance of pleural injury.
 - ▶ Preoperative treatment of the patient with lung disease, if any.
 - ▶ Early detection of injury by thoracic radiography.

The type of anaesthetic technique used may also affect the detection of pleural injury. The patient undergoing PCNL under spinal anaesthesia with mild sedation can complain of chest pain and respiratory distress during pleural injury, thus helping in early detection of chest injury which may not be obvious in general anaesthesia.

Figure 6 Expanded lung after removal of ICD tube.

Development of chronic empyema thoracis is a rare phenomenon after PCNL, which may develop when an infective focus reaches the pleural cavity. Management of hydrothorax is through pleural aspiration, with good coverage of intravenous antibiotics and respiratory exercises.

Management of chronic empyema thoracis or pyothorax includes aspiration of collected pus or intercostal drainage with intravenous antibiotics as per organism sensitivity. If not resolved, then VATS guided decortication can be carried out, as in our patient.

Learning points

- ▶ Chronic empyema thoracis is a rare complication of percutaneous nephrolithotomy.
- ▶ Early detection is important and measures to prevent pleural injury should be taken throughout the procedure.
- ▶ Early referral to a chest surgeon is mandatory because in later stages surgery becomes difficult.

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