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OOPS WE GOT IN THE CHEST: FLUOROSCOPIC CHEST TUBE INSERTION FOR HYDROTHORAX AFTER PERCUTANEOUS NEPHROSTOLITHOTOMY

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ABSTRACT

Percutaneous supracostal renal puncture provides ideal access to the collecting system or proximal ureter but is associated with an increased risk of pleural injury. We describe a simplified approach to intraoperative thoracostomy tube placement that uses urologic techniques and protects against recurrent hydrothoraces at second-look nephroscopy, without increasing patient morbidity or length of hospital stay. UROLOGY **60:** 1098–1099, 2002. © 2002, Elsevier Science Inc.

The pleural space typically extends inferiorly to the level of the 11th or 12th rib posteriorly, thereby placing it at risk of injury during open, as well as percutaneous, renal surgery. Violation of the pleural cavity is a well-known complication of percutaneous nephrostolithotomy (PCNL), with a reported incidence of 2.7% (8 of 300 nephrostomy tracts), as recently reported by Munver *et al.*[1] Supracostal access constitutes the primary risk factor for pleural transgression, with seven of eight intrathoracic complications (five hydrohemothorax, one pneumothorax, and two delayed nephropleural fistulas) occurring during a supracostal access. Golijanin *et al.*[2] described postoperative insertion of a chest tube or repeated thoracentesis for hydrothoraces after supracostal access for PCNL. We describe our intraoperative fluoroscopic technique of small-bore tube thoracostomy for hydrothorax associated with PCNL.

TECHNIQUE

At the conclusion of PCNL, it is our routine to evaluate the lung fields fluoroscopically for evidence of a hydropneumothorax. We have previously demonstrated that fluoroscopy is as sensitive as postoperative plain chest radiography for detecting clinically significant hydrothoraces.[3] With the patient in the prone position, fluid can be seen tracking along the lateral borders of the chest cavity and compressing the ipsilateral lung (Fig. 1).

To avoid painful chest tube placement in the awake patient, we insert a small (8F to 10F) Cope loop nephrostomy tube intraoperatively using real-time fluoroscopic guidance. Using the same equipment used to obtain percutaneous renal access, a 22-gauge Chiba needle is inserted percutaneously perpendicular to the chest wall at a convenient intercostal space along the posterior axillary line until the needle is seen entering the fluid-filled pleural space. With negative pressure on a 10-mL syringe attached to the end of the Chiba needle, the needle is withdrawn until pleural fluid is encountered. A 0.018-in. platinum-tip Nitinol wire is then passed through the Chiba needle into the pleural cavity under fluoroscopic guidance. A Jeffery Wire Guide Exchange Set (Cook Inc., Bloomington, Ind), consisting of an 8F outer sheath with an inner dilator and stiffener, is then passed over the Nitinol wire using the Seldinger technique. A 0.035-in. Bentson guidewire is passed through the Jeffrey sheath and coiled in the pleural space. After removing the Jeffrey sheath, a 10F Cope loop nephrostomy tube is passed over the guidewire and positioned in the base of the pleural cavity (Fig. 2). The guidewire is removed, and the nephrostomy coil is secured. The Cope loop is sutured to the skin and connected to a Pleur-evac (Genzyme, Cambridge, Mass) to maintain negative pressure within the pleural space. Parenchymal injury to the lung is rare, and consequently, the chest tube can usually be removed within 24 to 48 hours.

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Submitted: March 27, 2002, accepted (with revisions): June 14, 2002

0090-4295/02/$22.00
PII S0090-4295(02)01894-0

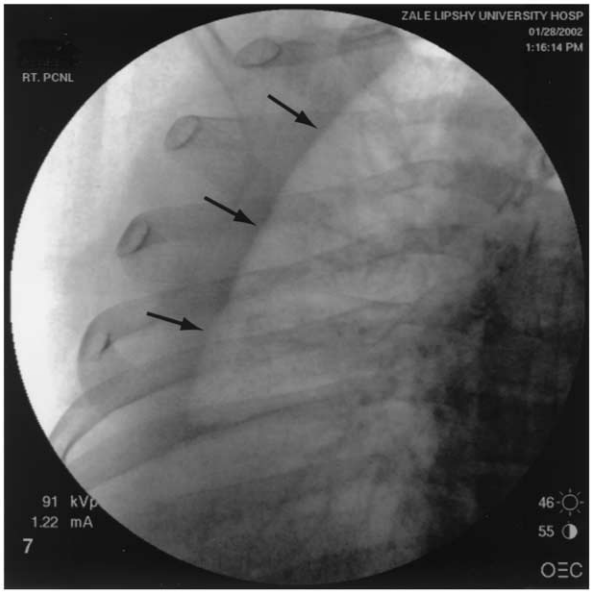

FIGURE 1. *Fluid within the pleural space compressing the lung (arrows).*

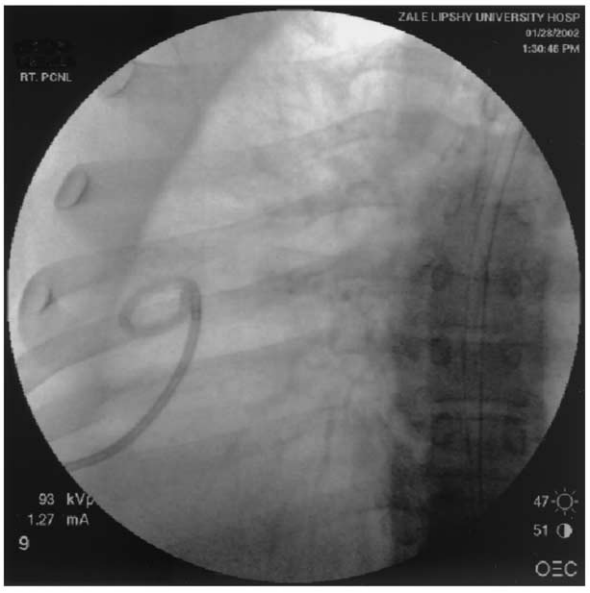

FIGURE 2. *A 10F Cope loop nephrostomy tube positioned in the base of the pleural cavity.*

COMMENT

PCNL is the treatment of choice for large and/or complex renal calculi. Supracostal puncture provides optimal access to the renal collecting system but is associated with a 5% to 15% risk of hydropneumothorax.[2,4,5] Intraoperative chest fluoroscopy can identify most clinically significant hydrothoraces and allows immediate drainage while the patient remains under anesthesia. Small-bore thoracostomy tubes are adequate for drainage of the vast majority of pleural fluid collections, which typically consist of irrigation fluid rather than blood. If significant blood is encountered, a larger thoracostomy tube can be placed. The advantage of small-bore thoracostomy tube placement, rather than simple thoracentesis, is that drainage is maintained in the event that second-look flexible nephroscopy is required, with the attendant risk of additional pleural fluid accumulation. This technique can easily be performed by the urologist and provides little additional morbidity or discomfort to the patient.

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