Infection and Sepsis

Infection and sepsis are very rare complications in PCNL, occurring in up to 2.2% (Lewis and Patel 2004). As in all other invasive stone procedures, preexisting urinary tract infection is treated at least 2 days in advance. Cases of obstruction and infection should primarily be managed by percutaneous drainage. PCNL is delayed until the infection has been treated successfully (urinary culture, hematologic signs of recovery from sepsis). During PCNL, we recommend prophylactic antibiotics in all cases. Antibiotic agents are selected according to local bacteria strain spectrum and resistance patterns, which should be monitored on a regular basis. At our institution, we commonly use fourth-generation chinolones, amoxicillin plus clavulanic acid, or an aminoglycoside.

Care must be taken to avoid high-pressure irrigation during the procedure, as this can lead to bacteremia and subsequent sepsis. To avoid high-pressure irrigation, we use a continuous flow nephroscope. The irrigation container must not be mounted higher than 40 cm above kidney level (Kukreja et al. 2002; Troxel and Low 2002).

Complications with the Percutaneous Nephrostomy Tract

The most severe complication of PCNL is puncturing other organs, especially colon, pleura, liver, gallbladder, or spleen. If the injury is recognized during the procedure, the complication can usually be handled straightforwardly. Unfortunately, most of these complications are diagnosed with a delay of several hours or even days.

Injury of the Colon

Routine preoperative ultrasound shows the anatomical relation of the colon and the kidney and is an important tool to prevent injury. Previous intraabdominal or renal surgery is associated with a higher risk of injury of the colon and may warrant preoperative CT of the abdomen to define anatomic relations.
Needle perforation of the colon is usually not recognized. Colonic perforation with the nephroscope is recognized after contrast filling of bowel at the nephrostogram at the end of the procedure (Fig. 17.2.1). Furthermore, bowel perforation must be suspected in all patients with abdominal pain postoperatively. The anatomic compartment of perforation – retroperitoneal or intraperitoneal – is differentiated by CT scan (distribution of air, fluid; Figs. 17.2.2–17.2.4). A water soluble contrast enema study can also be a valuable diagnostic tool.

Needle perforation is usually managed conservatively by observation of the patient. In case of a retroperitoneal perforation of the colon, placement of a nephrostomy tube should be avoided, and the collecting system of the kidney may be drained by a double-J stent. Intraabdominal perforation of the colon requires surgical intervention in almost all cases – usually a transient colostomy (Vallancien et al. 1985).