Percutaneous nephrolithotomoy operation in a patient with severe kyphosis
due to ankylosing spondylitis

Ankilozan spondilite bağlı ciddi kifozu olan hastada perkütan nefrolitotomi operasyonu

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Abstract
Ankylosing spondylitis is a chronic inflammatory form of arthritis that affects the spinal joints. The skeletal deformity caused by this condition may hamper surgical procedures by causing difficulties in patient positioning. We present our technique of patient positioning for percutaneous nephrolithotomy in a patient with severe kyphosis and immobility of the cervical spine caused by ankylosing spondylitis.

Key words: Ankylosing spondylitis; kyphosis; percutaneous nephrolithotomy.

Case report
A 47-year-old man suffering from left flank pain was presented to our outpatient clinic. Upon evaluation of his medical history, we found he had been suffering from ankylosing spondylitis for 30 years. A physical examination revealed severe thoracic kyphosis and restriction of cervical movements (Fig. 1). His blood chemistry was normal. A plain radiograph revealed left staghorn renal calculi (Fig. 2), and intravenous urography confirmed this diagnosis. The patient decided to undergo a left PCNL after he was informed of possible operative complications. There were two major obstacles that had to be addressed during the operation. The first of these was caused by kyphosis, which did not permit the patient to be safely placed in the prone position due to the potential space between the patient’s anterior abdominal wall and the operation table. This problem was overcome by filling the space between the table and the patient’s anterior abdominal wall with pillows. The second obstacle was caused by his severe kyphosis and immobility of the cervical spine. To overcome this, we inserted pillows to fill the space between the anterior abdominal wall and the operation table.

Submitted (Geliş tarihi): 03.01.2010
Accepted after revision (Düzeltme sonrası kabul tarihi): 26.05.2010
loss of cervical movements. Once the patient was safely in the prone position, his face was buried into the anesthesia table due to the restricted lateral rotation of the cervical spine; thus, ventilation following intubation would not have been possible. This problem was overcome by stabilizing the patient’s head in a horseshoe head holder, which is usually used in neurosurgical procedures (Fig. 3). The operation table was tilted to the reverse-Trendelenburg position to prevent venous stasis of the head, although it was difficult to perform the operation in this position. The operation was performed under general anesthesia. After ureteral catheterization in a lithotomy position, the patient was tilted to the prone position. The pyelocalyceal system was approached with the insertion of an 18-gauge Chiba needle from the upper and lower pole tracts with the guidance of fluoroscopy. The tract was dilated with Amplatz dilators (MarFlow®, Switzerland) through a guidewire, and a renal sheath
was inserted. Afterwards, nephroscopy was performed. A pneumatic lithotripter was used for stone fragmentation. The stone fragments were extracted by forceps. An 18F re-entry malecot nephrostomy catheter was inserted at the end of the operation. No residual fragments were detected in a kidney-ureter-bladder radiograph on the first day following the operation (Fig. 4). Pulmonary toilet training was initiated as soon as the patient recovered from anesthesia. The nephrostomy tube was removed on the second day after surgery, and the patient was discharged on the third day after surgery. Upon analysis, the stone was reported as a whewellite stone.

**Discussion**

Ankylosing spondylitis has well-defined renal complications, but urolithiasis has not been studied in detail. Secondary renal amyloidosis is the most common cause of renal involvement in AS (62%), followed by IgA nephropathy (30%), mesangio-proliferative glomerulonephritis (5%), membranous nephropathy (1%), focal segmental glomerulosclerosis (1%), and focal proliferative glomerulonephritis (1%).[2] In their study, Vilar et al.[3] reported renal abnormalities in 35% of AS patients, but did not assess the formation of renal calculi in any patients. In another study, the prevalence of renal stones was found to increase in AS patients.[4] Ankylosing spondylitis itself is a contributing factor for changes in calcium metabolism due to spinal immobility, inflammatory cytokines, the prolonged use of non-steroidal anti-inflammatory drugs, and new bone formation.[5]

Severe kyphosis of the spine in advanced AS is a well-known problem that reduces quality of life. Minor trauma can cause fractures in the rigid spine of those suffering from AS. Surgical procedures performed in special positions such as the prone position pose high risks for vertebral fracture in patients with skeletal deformities such as AS. Therefore, patients should be handled with utmost caution once they are anesthetized. In our case, the desired surgical position was achieved by the liberal use of bolster pillows to support the torso, the stabilization of the patient’s head and cervical spine in a horseshoe head holder, and by tilting the table to a reverse-Trendelenburg position to prevent cerebral edema. This method can be used in similar situations to safely place the patient in the required surgical position for PCNL and other procedures performed in the prone position.

**Conflict of interest**

No conflict of interest was declared by the authors.

**References**