



Bilateral microperc in a severe kyphoscoliosis

Şiddetli kifoskolyozda bilateral mikrop perk

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ABSTRACT

Percutaneous nephrolithotomy is the standard modality for large renal calculi in normal and abnormal renal anatomic situations. This case report describes a 57-year-old male patient who presented with bilateral kidney stones and severe kyphoscoliosis. He had successfully been treated with a bilateral microperc technique.

Keywords: Bilateral; kyphoscoliosis; micropercutaneous nephrolithotomy

ÖZ

Perkütan nefrolitotomi, normal ve anormal anatomili böbrek durumlarında büyük böbrek taşlarında standart yöntemdir. Bu olgu sunumunda bilateral böbrek taşı ve şiddetli kifoskolyozu olan 57 yaşındaki erkek hasta sunulmaktadır. Hasta bilateral microperc operasyonu ile başarılı bir şekilde tedavi edildi.

Anahtar kelimeler: Bilateral; kifoskolyoz; mikroperkütan nefrolitotomi

Introduction

Percutaneous nephrolithotomy (PNL) is accepted as the procedure of choice for the treatment of stones with a diameter of >2.0 cm as well as for the treatment of complex renal stones.^[1] With technological advances and the miniaturization of instrument sizes, the operative technique has improved, success rates have increased, and complications and morbidity have decreased during PNL. Micropercutaneous nephrolithotomy (microperc) is the latest technological advancement for PNL.

However, some recent publications have indicated that PNL is a reliable procedure in patients with anatomic problems (e.g., horse-shoe kidneys, rotation anomalies, ectopic kidneys, fusion anomalies, and musculoskeletal abnormalities).^[2] Percutaneous renal surgery in these patients is more challenging because of the abnormal renal position and abnormal relationships with other organs.

In this case, we report a 57-year-old male who presented with bilateral kidney stones

and severe kyphoscoliosis. He had successfully been treated with a bilateral microperc technique.

Case presentation

A 57-year-old male was referred to our clinic with a diagnosis of bilateral renal pelvic stones (30 mm left and 25 mm right) and severe kyphoscoliosis. Noncontrast-enhanced abdominal computed tomography (CT) was performed to define the condition of the surrounding organs and confirm the location of renal stones (Figure 1). After a signed informed consent was obtained, a 5-Fr open-ended ureteral catheter was inserted into the patient's right ureter and a 4.8-Fr 28.0-cm double-J stent was inserted into the left ureter under general anesthesia and in the lithotomy position. The operation was continued in the supine position because of the musculoskeletal abnormality caused by severe kyphoscoliosis that blocked the prone position. PNL was performed under ultrasound (US) guidance at our center, particularly in pediatric cases and in patients with anatomic abnormalities.^[2] US

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was used to determine the anatomy and localization of the renal and pelvicalyceal systems, neighboring organs and relationships, calculi, and the calix that provides an access to the calculus. Percutaneous access to the right renal collecting system was obtained by an “all-seeing needle” (PolyDiagnost, Pfaffenhofen, Germany) under US guidance, as previously described.^[2] After entering the collecting system via the “all-seeing needle,” the next step of the operation was fragmentation of the calculus by a 273-micron laser. The stone was fragmented, but two parts of the stone were not fragmented into smallest pieces. These two parts escaped from our vision. After stone fragmentation, an 8-Fr nephrostomy tube was inserted, and it was removed on the postoperative first day. The patient was discharged on the postoperative second day. One month later, the patient was called for undergoing surgery on the left side. The radiological evaluation demonstrated that two small stone pieces were located at the right distal ureter and left kidney stone. After the signed informed consent was obtained, under general anesthesia and in the lithotomy position, right distal ureter stones were fragmented by semi-rigid ureteroscopy and a double-J stent was applied to the right ureter because of edema. Then, a 5-Fr open-ended ureteral catheter was inserted into the patient’s left ureter.

Consistent with the previous surgery, the operation was continued in the supine position (Figure 2). We again evaluated the left kidney and neighboring organs and their relationships under US guidance. This time, the percutaneous access to the left renal collecting system was obtained using a 14-gauge intravenous cannula under US guidance, as previously described (Figure 3).^[3] After observing urine flow through the needle, the metal needle was removed from inside the intravenous cannula and the sheath over the needle (named as “microsheath” by our clinic) was used as an Amplatz sheath (microsheath) during microperc surgery.^[3] A second intravenous cannulation was performed on the collecting system near the first cannula to reduce the pressure in the collecting system during surgery. The next step of the operation was fragmentation of the calculus by the 273-micron laser. The stone was completely fragmented. After the stone fragmentation procedure was completed without using a nephrostomy tube, on the first postoperative day, the patient was evaluated based on a plain abdominal film; laboratory tests were performed to assess the stone-free condition and hematocrit changes. The patient was discharged with oral antibiotics and analgesic regimens on the postoperative second day. At the first month of the follow-up, no residual stone was observed on a noncontrast-enhanced abdomi-



Figure 1. Plain film showing bilateral renal stones



Figure 2. Patient position during PNL and localization of the access point



Figure 3. Left microperc with microsheath

nal CT scan and plain film. The right ureteral double-J stent was removed by semi-rigid ureteroscope.

Discussion

Percutaneous nephrolithotomy is the standard modality for the management of large renal calculi for normal anatomy. Recently, several publications have demonstrated that this procedure is reliable for patients with renal anatomic problems. However, PNL in abnormal anatomic conditions can be more complicated because of their anatomic differences.

In the published data, only two studies have mentioned PNL for kidney stones in patients with kyphoscoliosis. In these patients, both authors highlighted the importance of preoperative anatomic planning and the necessity for alternative access techniques (i.e., fluoroscopy guidance, US guidance, laparoscopy-assisted guidance, and CT guidance) because of the anatomical differences of renal and adjacent organs. They said that standard PNL can be performed feasibly, safely, and effectively in anatomically abnormal kidneys as well as in kyphoscoliosis.^[2,4]

Obtaining a successful percutaneous access to the renal collecting system is the first and the most important step in PNL, and this procedure has mostly been performed under fluoroscopic guidance. However, we preferred obtaining an access to both kidneys under US guidance, as we have previously described.^[2]

In the present literature, Tepeler et al.^[5] and Desai et al.^[6] performed microperc in the pelvic ectopic kidney and pelvic kidney of a patient, respectively.^[5,6] Armagan et al.^[7] also performed microperc in one patients with kyphoscoliosis.^[7] In this manner, they avoided the complications related to access such as adjacent organ injury, intraoperative bleeding, and perforation of the collecting system. Microperc, which has the smallest available tract size to date, has some advantages in these patients. One of the advantages of this instrument is an entrance into the collecting system using the “all-seeing needle” under direct vision. This helps the surgeon to facilitate the renal collecting access, which is complicated in these patients. Another advantage of this instrument is the smallest (4.8 Fr) size of the needle, which inflicts the least damage when injured adjacent organs are present.

In our patient, we performed bilateral microperc on a 57-year-old male with a diagnosis of bilateral kidney stones and severe kyphoscoliosis. Preoperative computed tomography scan revealed the condition of the renal anatomy and adjacent organs. Thus, we decided to use US guidance for obtaining percutaneous access in both kidneys. At the end of the procedure, the patient was stone-free. We can conclude that this minimally invasive surgery technique helped us to appropriately treat this challenging case of the patient without any complications.

In patients with musculoskeletal deformities, particularly kyphoscoliosis, the microperc technique may prove to be a safer method than

the standard PNL surgery. Large-scale studies should be conducted to determine the effectiveness and safety of this method in detail.

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