Ureteroscopy-assisted retrograde nephrostomy for an obese patient

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ABSTRACT

Obesity is associated with increased surgical morbidity and mortality. We previously reported on the usefulness of ureteroscopy assisted retrograde nephrostomy (UARN) and here we report a case of renal calculi successfully treated with UARN during percutaneous nephrolithotomy (PCNL) in an obese patient. A 63-year-old female with left renal calculi was referred to Department of Urology, Ohguchi Higashi General Hospital. Her body mass index was 34.0 kg/m². Stone fragments were completely extracted. URS-assisted puncture from the renal collecting system to the skin under fluoroscopic guidance was a safe and easy procedure in our obese patient.

Key words: Lawson catheter, obese, obesity, percutaneous nephrolithotomy, retrograde nephrostomy, ureteroscopy

INTRODUCTION

Although disadvantages of percutaneous nephrolithotomy (PCNL) in obese patients have not been reported, in general, obesity has been associated with increased surgical morbidity and mortality.[1] PCNL is usually performed with the patients in prone position,[1] but in morbidly obese patients, this can exacerbate respiratory compromise and impede venous return. To avoid these problems, PCNL in the supine position was tried and it is now well established. We previously reported on the usefulness of ureteroscopy (URS)-assisted retrograde nephrostomy (UARN) in the Galdakao-modified Valdivia position, a position which allows simultaneous percutaneous and retrograde access.[2]

We herein report a case of a renal calculus successfully treated with UARN during PCNL in an obese patient.

CASE REPORT

Case

A 63-year-old female with a left renal calculus was referred to our hospital. Radiography revealed a renal calculus (23 × 16 mm), as shown in Figure 1a and 1b. She had no remarkable previous or family history including obesity (158 cm, 85 kg). Her body mass index was 34.0 kg/m² and laboratory data showed no remarkable findings. In February 2011, she was admitted to Department of Urology, Ohguchi Higashi General Hospital for PCNL to treat the left renal calculus.

Procedure

Under general and epidural anesthesia, the patient was placed in a Galdakao-modified Valdivia position.[2] A flexible ureteroscopy (Flex-X2, Karl Storz, Tuttlingen, Germany) was inserted through an 12 Fr (inner diameter) ureteral access sheath (FlexorÒ, 12 Fr, 35 cm, COOK Urological, IN, USA) inserted into the ureter. We carefully observed the target calculus and defined the appropriate position to puncture. A Lawson retrograde nephrostomy puncture wire (Cook Urological) was then set into the flexible URS. The scope was advanced to the desired calyx again and the puncture wire was driven along the route from the middle calyx to the exit skin. To avoid injury to the spleen, intestines, liver, and pleural cavity, the puncture was performed under ultrasonography. The puncture wire passed through the muscle easily and “tented” the skin at the posterior axillary line under fluoroscopic guidance. The skin was incised and the needle was delivered. Next, the dilator was placed over the puncture wire and
advanced through the skin, subcutaneous fat, abdominal wall musculature, and perinephric fat until it reached the renal parenchyma under the URS. A 30 Fr percutaneous nephro access sheath (X-Force®, Nephrostomy Balloon Dilation Catheter, BARD, NJ, USA) was passed over the balloon under continuous visualization with the URS. After inserting the nephro access sheath into the renal collecting system, calculus fragmentation was undertaken using the Swiss Litho Clast® lithotripter (EMS, Nyon, Switzerland) through a rigid nephroscope (percutaneous nephroscope, KarlStorz). The operation time was 171 minutes and no major or minor complications were noted. A postoperative kidney-ureter-bladder (KUB) film is shown in Figure 1b. Stone analysis revealed calcium phosphate and calcium oxalate.

DISCUSSION

Shock wave lithotripsy (SWL) is often precluded in obese patients due to weight limitations on the table, inability to target the stone due to inadequate fluoroscopic or ultrasonographic imaging, and a skin-to-stone distance exceeding the distance between the point of shock wave generation and the shock wave focal point. Flexible ureteroscopic lithotripsy for obese patients has been reported to result in stone-free rates of around 70–100%. However, because of the length of time required to fragment and remove larger stones, it has been suggested that patients with a greater stone burden would be better treated with PCNL. Indeed, PCNL is preferable for large renal calculi (>2 cm) in obese patients. As increased surgical morbidity and mortality is associated with obesity in general, PCNL is performed in the supine position for morbidly obese patients to minimize risks.

The most critical point in PCNL placement remains puncture site selection, to minimize the risk of hemorrhage as the most probable major complication. US-guided puncture of the collecting system with subsequent placement of the drainage tube under fluoroscopic guidance is the standard modality for PCNL, but US-guided PCNL is difficult in obese patients because of the long distance from the skin to the collecting system. We previously reported the success of UARN in the Galdakao-modified Valdivia position, and here decided to apply it in an obese patient. In 1987, Valdivia-Uria described PCNL with the patient in the supine position, with a 3 L saline bag below the flank, which affords both surgical and anesthesiological advantages. Thereafter, Ibarluzea et al. reported a Galdakao-modified Valdivia position in 2001 that affords simultaneous percutaneous and retrograde access. The Lawson technique has failed to gain widespread acceptance due to difficulties to create long tracts especially in obese individuals under fluoroscopic guidance. The reason of this difficulty comes from the difficulty of making fine adjustment under fluoroscopic guidance for the obese patients whose skin to stone distance is quite long. Against this background, we decided to use the UARN technique as it affords continuous visualization with the URS and fluoroscopy, and thus contributes to the adequacy of the puncture and the ease of changing direction without extracting the puncture wire. In the present case, nephrostomy was achieved easily and in an ideal position, without the need for a position change from the lithotomy position to prone and vice versa.

CONCLUSIONS

URS-assisted puncture from the renal collecting system to the skin under fluoroscopic guidance was a safe and easy procedure in an obese patient. UARN may be effective for PCNL in obese patients.
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