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Percutaneous nephrolithotomy (PCNL) in the supine position in a horseshoe kidney using an upper pole access

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Introduction: Performing PCNL in a horseshoe kidney can be risky and challenging. We present the technique of PCNL in the supine position in a horseshoe kidney using an upper pole access.

Materials and Methods: The patient is a male of 44 years with a horseshoe kidney and with multiple stones in the left kidney: a staghorn stone of the upper infundibulum (20 x 18 mm) with hydronephrosis of the upper calyces, multiple upper calyceal stones (9 x 5, 9 x 5, 10 x 9 mm) and a pyelic stone (11 x 10 mm) (Fig.1). The patient underwent a single PCNL in the supine oblique position (Fig.2). A three dimensional CT scan with simulation of the percutaneous access was performed before the procedure (Fig.3). An ultrasound fluoroscopically adjusted puncture was performed with a single subcostal direct access to the upper calyx (Fig.4). The percutaneous tract was dilated with a balloon up to 24 Fr and an Amplatz cannula was positioned (Fig.5). First, a combined ultrasonic and ballistic lithotripsy was performed using the rigid nephroscope (Fig.5). The supine position facilitated the spontaneous drainage of many fragments speeding up the procedure. Then, a flexible nephroscope was introduced and the renal pelvis was easily reached (Fig.5). A Ho:YAG laser lithotripsy was performed and all the fragments were removed using a nitinol basket. At the end of the procedure a JJ ureteral stent and an 8 Fr nephrostomy were placed (Fig.6).

Results and Discussion: There were no intra- or postoperative complications. At 40 days there was no evidence of residual stones in the CT scan.

Discussion: Because of the different anatomy of a horseshoe kidney, a CT based planning of the procedure proved to be very useful. An ultrasound puncture of the renal cavities can give more versatility performing the access and gives real time informations about the anatomy of the kidney and the surrounding organs. Finally, despite the fact that in the supine position an upper pole access can be more difficult, in the case of a horseshoe kidney the upper pole is lower and closer to the site of the access than the other cavities. The use of flexible scopes can be very useful in order to avoid multiple accesses, minimizing the invasiveness of the procedure.

Conclusions: PCNL in the supine position with a direct upper pole access in a horseshoe kidney is feasible, safe and effective.

Figure 1. CT Scan of horseshoe kidney with left kidney stones



Figure 2. Valdivia position and 3D CT scan simulation of the access

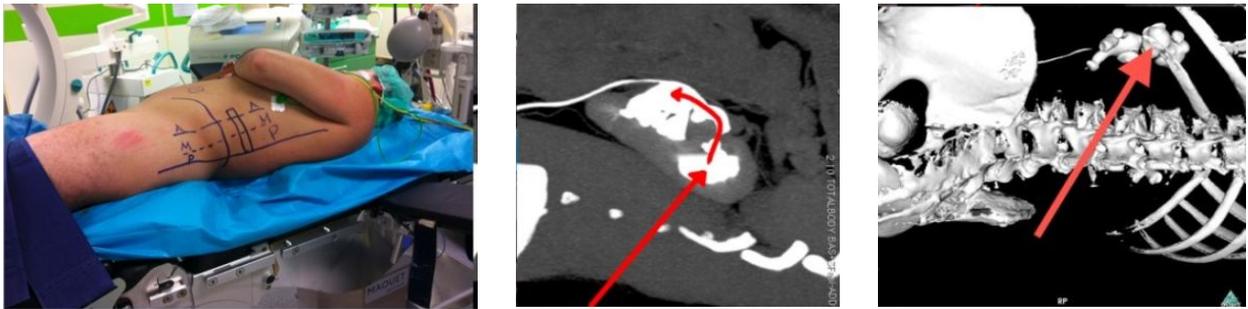


Figure 3. Percutaneous access to the upper pole



Figure 4. Rigid nephroscopy in the upper pole

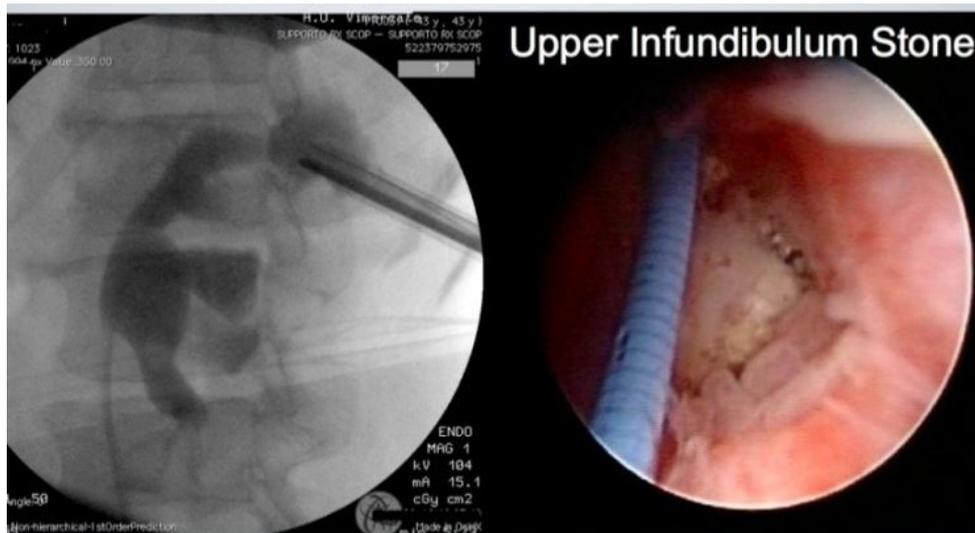


Figure 5. Flexible nephroscopy

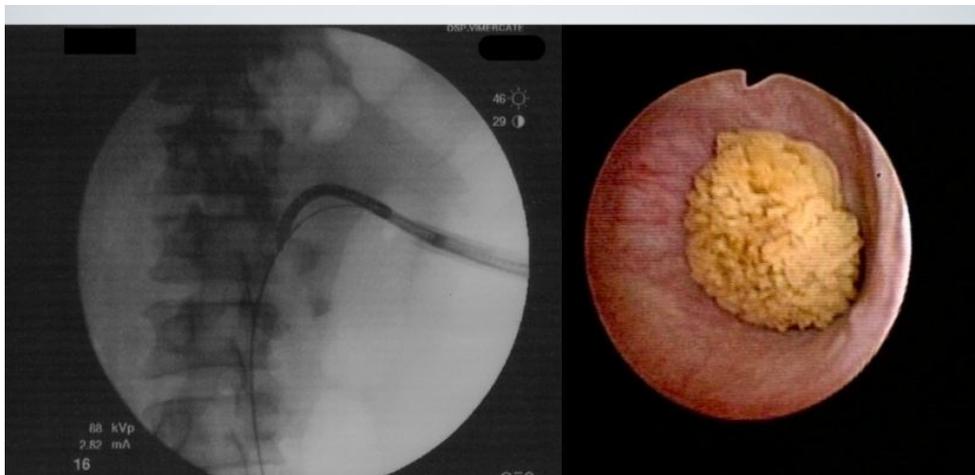
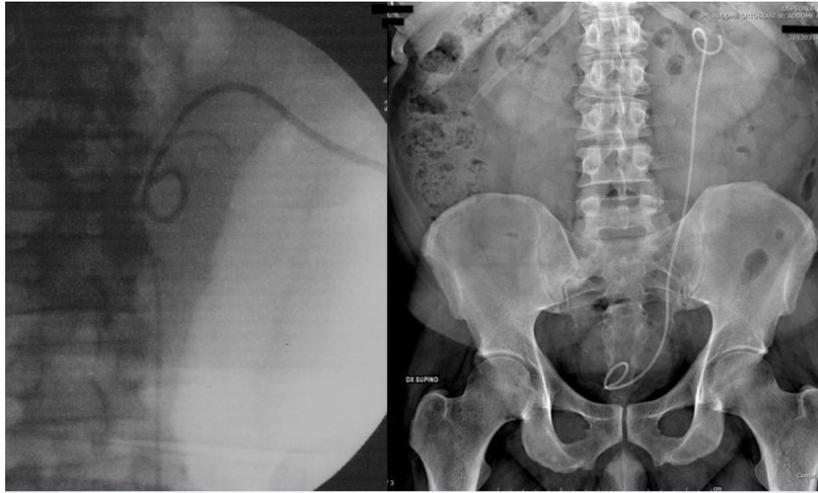


Figure 6. Final result



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