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CASE REPORT

UROLITHIASIS

Massive migration of embolization coils inside the renal pelvis. A rare complication that can be approached through percutaneous surgery

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Percutaneous nephrolithotripsy (PCNL) has become a common procedure performed in patients with large renal calculi. Hemorrhage is the most frequent complication of this procedure. Transcatheter renal artery embolization is an effective and minimally invasive treatment option for acute renal bleeding but it is not without risks. In the case we describe, a big stone originated on embolization coils which migrated inside the renal pelvis after a previous PCNL and transcatheter artery embolization. We show that a new percutaneous approach is feasible and allows for the fragmentation of the stone and full clearance of fragments and coils.

Key Words: coil ‹› embolization ‹› migration ‹› percutaneous nephrolithotripsy ‹› percutaneous ‹› stone

CASE PRESENTATION

We describe the case-study of a 27 year old patient, who underwent PCNL in 2013. During this procedure, he presented with a hemorrhagic complication and needed a transcatheter artery embolization. After 5 years, he suffered lumbar pain and hematuria. A computed tomography (CT) scan showed the presence of a pelvic stone of the dimensions of approx. 3.5 by 2.5 cm with beam-hardening artifacts (Figure 1).
We chose to treat this case with a percutaneous approach. The intra-operative X-ray images showed the presence of a stone with radiopaque wires inside. After the creation of the percutaneous access, we identified the stone and started the lithotripsy with combined ballistic-ultrasonic energy. Inside the stone, several embolization coils were revealed (Figure 2).
The stone was then completely fragmented. With the aid of forceps, all of the fragments and metallic wires were extracted. The tangle of metallic threads is shown in Figure 3.
At the end of the surgery, a new X-ray images confirmed the absence of radiopaque images inside and outside the excretory urinary system. No significant bleeding occurred in the intra- and in the post-operative period, with a decrease of 0.4 mg/dl in the hemoglobin count. The patient was discharged on the third postoperative day.

DISCUSSION

Embolization coil migration is a very rare complication reported in <2% of cases. The migration of coils in the collecting system is extremely rare, with only a few cases reported [1–5].

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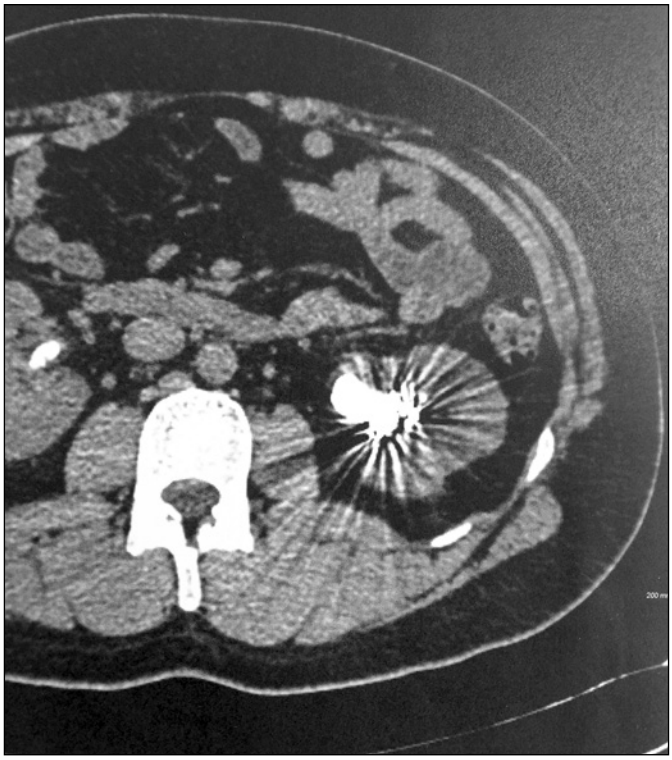

Figure 1. *Axial CT scan showing the stone in the renal pelvis with beam-hardening artifacts.*

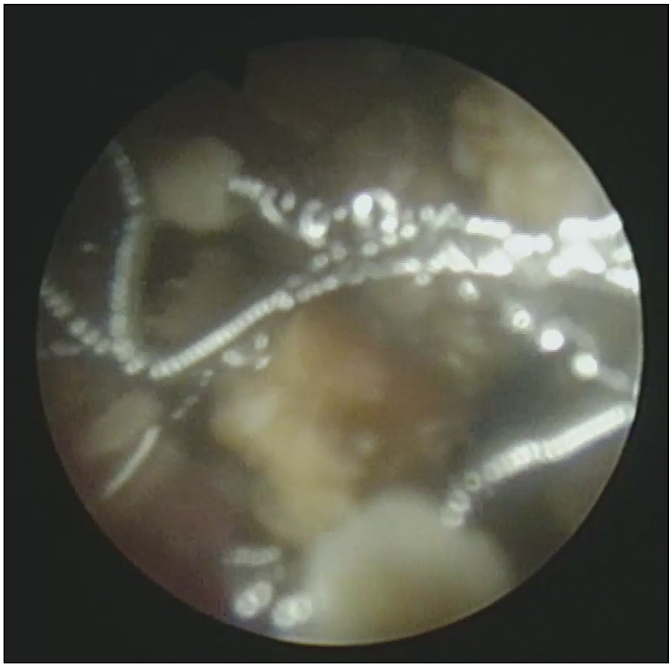

Figure 2. *Endoscopic view of coils located inside the stone.*

Figure 3. *The tangle of metallic threads and stone fragments in the hand of the surgeon.*

Coils' migration can present early or years after embolization.

Both in early and in late migration, coils can lead to pain, hematuria, obstruction of the urinary system and impaired renal function. Early obstruction was described by Rajesparan et al. [1] and Reed et al [2]. In the first report, coils were removed by ureteroscopy, while in the second one, spontaneous passage of the coils occurred.

A late migration is usually more challenging to treat. Coils can act as a nidus for stone formation. In literature, some cases are reported where, after a variable period of time, stones arose inside and around coils migrated in the excretory system. As we can see in the literature, the treatment of such a condition is not standardized. The first report is by Rutchik [3]. A stone formed around a wire coil was treated by ureteroscopy via pneumatic lithotripsy and grasps. Other reports are by Poyet et al. [4] and Kumar et al. [5]. The first one used a retrograde intrarenal approach to fragment the stone by holmium laser energy, and to extract the coil. The second one used a percutaneous approach, given the size of the stone.

In our case study, PCNL was the most minimally invasive surgery feasible and only nephrolithotomy could have been seen as an alternative. The dimension of the stone and of the tangle of wires we had to treat is, in fact, the biggest ever reported in literature.

We can assume that the presence of the coils in the renal pelvis originated from their massive migration from the arterial system. We do not know

how many arterial branches were damaged during the first surgery and we do not know the dimension of the arteries damaged but, in consideration of the large amount and of the length of the coils found, we can suppose it was a difficult hemorrhage to treat. With time, these migrated coils encrusted and determined the stone formation.

For the lithotripsy, we chose the combined ultrasonic-pneumatic energy. In our opinion, this is the energy to favour as it causes the fragmentation/dusting of stones, without cutting the coils. Once the wires are free from stone fragments they can be easily removed with forceps. On the contrary, laser energy will cut metallic wires [6], producing fragments that could be difficult to remove. One of the key points of this case-report is the demonstration that a PCNL approach is also feasible in patients with previous bleeding complications during a similar surgery. We believe that if the time between the embolization procedure and a new PCNL surgery is sufficient to guarantee the closure of the arterial vessels, no contraindications exist to the repetition of the PCNL procedure.

CONCLUSIONS

The present case study confirms moreover that a late migration of embolization coils should always be considered in patients with relapse of flank pain, hematuria or other symptoms related to renal stones.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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