CASE REPORT

Renal Pelvis Epidermoid Cyst Mimicking Staghorn Calculus: Successful Treatment with Percutaneous Approach (PCN)

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Renal pelvis epidermoid cysts are extremely rare and are often misdiagnosed as stones or tumors. Only one previous case has been treated using the percutaneous approach. A 67-year-old female with diabetes who was receiving empagliflozin presented with imaging findings suggestive of a staghorn calculus. During percutaneous nephrolithotomy, whitish keratinous material was found in the renal pelvis, along with a small obstructing stone. All material was evacuated through the Amplatz sheath. Urine culture was negative. Histopathological examination confirmed an epidermoid cyst. A postoperative computed tomography scan at 1 month showed complete resolution. Epidermoid cysts can radiologically mimic staghorn calculi. A fungal ball was initially suspected because of diabetes and sodium-glucose cotransporter 2 inhibitor therapy, but radiopacity, negative culture, and histopathological findings ruled this out. Percutaneous nephrolithotomy served as both a diagnostic and therapeutic procedure while preserving renal function. Renal pelvis epidermoid cysts should be considered in the differential diagnosis of opaque pelvic lesions. Percutaneous nephrolithotomy is a minimally invasive, kidney-preserving treatment that can be performed as a renal-sparing procedure.

Keywords: renal pelvis; epidermoid cyst; percutaneous nephrolithotomy; staghorn calculus; kidney pelvis

INTRODUCTION

Epidermoid cysts are common in the skin but rare in the renal pelvis. Most reported cases have been managed with radical or partial nephrectomy because of suspicion of malignancy.[1-3] Only one previous case has described management using percutaneous nephrolithotomy (PCNL).[4] We report the second such case, highlighting the diagnostic challenge and minimally invasive management in a patient with diabetes who was receiving empagliflozin, which increases the risk of urinary tract infections.[5] We emphasize that this benign condition can be treated using the percutaneous approach.

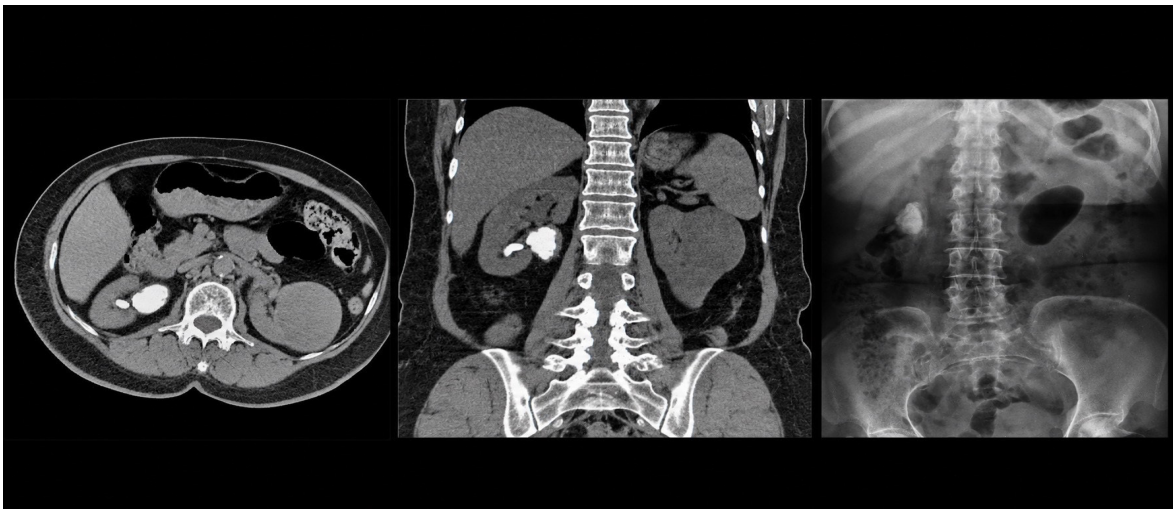

Figure 1. Preoperative computed tomography scan showing dense renal pelvis and lower-pole opacity mimicking a staghorn calculus.

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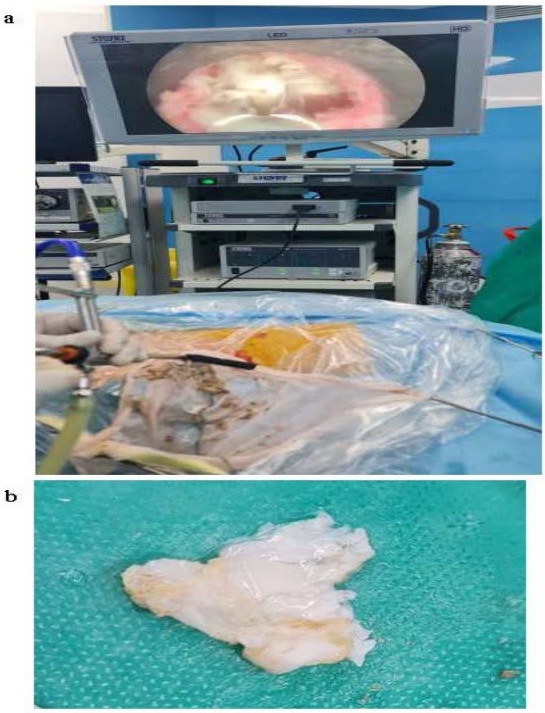

Figure 2. Intraoperative percutaneous nephrolithotomy showing whitish keratinous material evacuated through the Amplatz sheath.

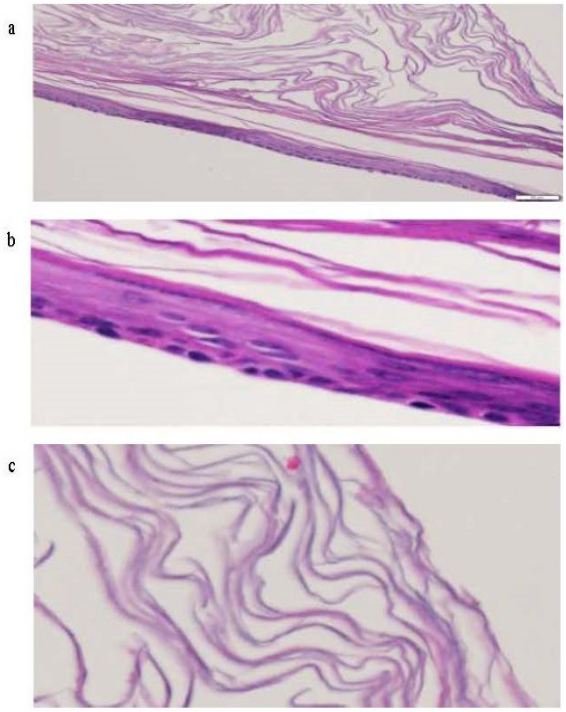

Figure 3. Histopathological examination showing a cyst lined by stratified squamous epithelium containing keratin material.

CASE PRESENTATION

A 67-year-old female with type 2 diabetes who was receiving empagliflozin presented with intermittent flank pain. She had no history of fever or weight loss. Ultrasonography and computed tomography (CT) suggested a staghorn calculus (**Figure 1**). Urine culture was negative.

The patient was scheduled for PCNL. Under general anesthesia, a 6-French ureteral catheter was inserted into the right renal pelvis using a cystourethroscope. Percutaneous access was then performed in the prone position under ultrasound guidance. The tract was dilated using a 10-French dilator, and then a 30-French dilator was introduced over an Alken metal antenna, as previously reported.[6] Finally, a 30-French access sheath was introduced over the Amplatz dilator, and nephroscopy was started using a 27 Fr Wolf nephroscope. At this step, we noted whitish keratinous material in the calyces and renal pelvis (**Figure 2**). These materials were completely removed, and fluoroscopy confirmed no residual particles. The lesion did not show any connection with the urothelium, and no unusual bleeding occurred. A small renal pelvis stone was also removed. Because of suspicion of probable infection, the materials were sent for culture, which later showed negative results. Histopathological examination of the specimen showed a cyst lined by keratinizing stratified squamous epithelium with lamellated keratin debris, confirming an epidermoid cyst (**Figure 3**). A 1-month postoperative CT scan demonstrated complete resolution (**Figure 4**).

DISCUSSION

Epidermal cysts of the pyelocaliceal system are exceedingly rare and may radiologically resemble renal calculi. In cases presenting with filling defects within the renal pelvis, the differential diagnoses should include calculi, blood clots, neoplasms, tuberculosis, and fungal balls. In our patient, preoperative ultrasonography and CT imaging suggested a renal calculus. Intraoperatively, the presence of whitish material within the renal pelvis raised suspicion of a fungal ball, particularly given the patient's diabetes and empagliflozin therapy, which is associated with an increased risk of urinary tract infections. However, histopathological evaluation ultimately confirmed an epidermoid cyst. Unlike fungal balls, which are usually radiolucent and seldom calcified, epidermal cysts can appear radiopaque. Some reports have shown that fungal balls may be effectively managed through PCNL.[7] We report here that epidermal cysts may also be successfully treated with this less invasive approach.

Most previous cases were treated with nephrectomy because of suspicion of malignancy.[1,3] Kim et al. reported the first case that was diagnosed as a renal stone and managed with PCNL, demonstrating that the cyst could be evacuated minimally invasively while preserving renal function.[4] In their patient, residual fragments were detected on postoperative radiography, and the patient was scheduled for periodic follow-up. In contrast, our patient's postoperative CT scan was completely normal at the 1-month follow-up. To the best of our knowledge, we report the first case of complete removal of the lesion percutaneously.

Our case adds several unique aspects: the patient had diabetes and was receiving empagliflozin, which initially led to suspicion of a fungal ball; there was a coexisting small renal pelvis stone that was treated simultaneously; and postoperative CT confirmed complete resolution. This reinforces PCNL as both a diagnostic and therapeutic approach for rare renal epidermoid cysts.

Renal tuberculosis (TB) is another rare but important

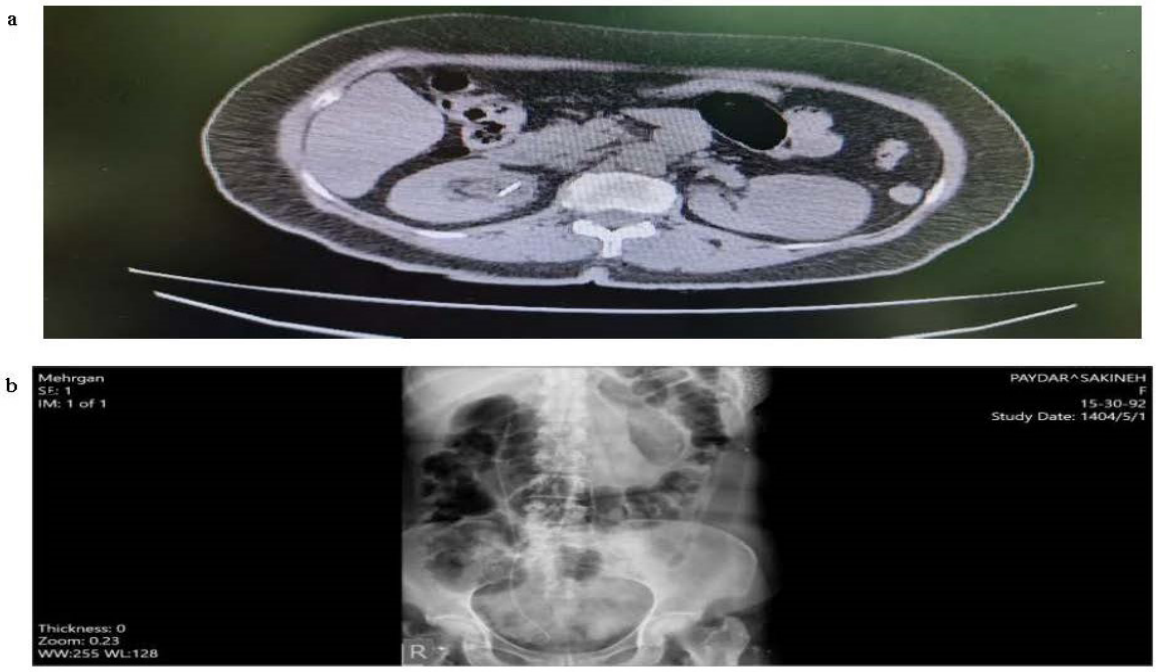

Figure 4. Postoperative computed tomography scan at 1 month showing no residual component of the renal pelvis lesion. A double-J stent is observed in the renal pelvis.

differential diagnosis for radiopaque renal lesions. TB may present with hematuria, flank pain, and nonspecific imaging findings, such as calcifications in the renal pelvis, which can mimic staghorn calculi or cystic lesions. Gao et al. reported a case of a lower-pole cystic lesion mimicking a TB abscess, which was treated by partial nephrectomy after empirical medical treatment with anti-TB medications. Pathological evaluation showed an epidermal cyst.[2] It should be noted that TB lesions are often associated with parenchymal scarring, ureteral strictures, and systemic signs, such as fever or weight loss. Sterile pyuria and a high erythrocyte sedimentation rate may be present. In our patient, the absence of systemic symptoms, negative urine cultures, and histopathological confirmation of an epidermoid cyst excluded TB as a possible diagnosis. However, awareness of renal TB is essential, particularly in endemic regions, to avoid misdiagnosis, unnecessary interventions, and the possible risk of sepsis after surgery in an untreated patient.[8]

CONCLUSIONS

This is the second reported case of a renal pelvis epidermoid cyst treated via PCNL. Awareness of this rare entity, especially in patients with diabetes and suspected fungal balls or stones, can prevent misdiagnosis and unnecessary radical surgery.

SUMMARY

A rare renal pelvis epidermoid cyst mimicked a staghorn stone and was completely treated using PCNL, avoiding unnecessary radical kidney surgery.

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