Percutaneous nephrolithotomy of a staghorn calculus in a patient with renal angiomyolipoma

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INTRODUCTION

Angiomyolipoma (AML) is the most common benign renal tumor and is comprised of blood vessels, smooth muscle cells, and fat cells. It is prevalent in around 0.2%–0.6% of the population and is more likely to occur in females. The main clinical concern behind AML is the risk of bleeding, with it being the most common cause of nontraumatic retroperitoneal hemorrhage.³ Staghorn calculi are renal stones that cast the whole renal pelvis, major calyces, and one or more of the minor calyces. These stones are usually composed of either struvite and/or calcium carbonate apatite.³ Staghorn calculi can be managed with percutaneous nephrolithotomy (PCNL), extracorporeal shock wave lithotripsy (ESWL), or open surgery.

There had been only two previously reported cases of staghorn calculi presenting concurrently with AML.¹⁴ In this case report, we will describe the workup and a different approach in the management of patient with a staghorn calculus and AML in the same kidney.

CASE REPORT

A 41-year-old female patient, who is known case of chronic anemia, was referred from a private clinic with complaints

Abstract

Renal angiomyolipoma (AML) is the most common benign renal tumor and is prevalent in around 0.2%–0.6% of the population. Its main associated risk is bleeding. It is uncommon that AML presents simultaneously with a staghorn calculus requiring percutaneous nephrolithotomy (PCNL) for stone resolution with only two previously reported cases. In this case, we present a 41-year-old female patient who presented with a 2-year complaint of left flank pain and hematuria. Following investigation, the patient had a large staghorn calculus in the left kidney and an incidental finding of a large AML in the ipsilateral kidney. A single puncture was made under ultrasound guidance, to avoid any form of injury to the AML, and complete stone clearance was achieved through a single tract only. Although the concurrence of AML with a renal calculus requiring PCNL presents a clinical challenge, using ultrasound guidance for stone clearance is a safe and successful means of management with minimal exposure to radiation.

Keywords: Angiomyolipoma, percutaneous nephrolithotomy, staghorn calculus, ultrasound-guided percutaneous nephrolithotomy

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of sharp intermittent flank pain associated with hematuria for approximately 2 years’ duration, which was aggravated by movement and postmeses. She had no past surgical history. She was not taking any medications, not allergic to anything, and was fully vaccinated. She is a carrier for sickle cell trait.

On examination, her body mass index was 35.25 kg/m² with creatinine and urea of 55.0 umol/L and 3.0 mmol/L, respectively, and hemoglobin level was 8.5 g/dL. An abdominal X-ray showed a large branching radiopaque stone in the left kidney [Figure 1]. A computed tomography (CT) scan showed a large complete staghorn stone (7 cm × 4 cm × 2 cm) filling the renal pelvis and all calyces and an incidental finding of a large posterior midpole renal AML with no signs of bleeding [Figure 2].

Preoperatively, the patient was appropriately worked up, had blood transfused, and made sure to be fit for surgery. Using ultrasound guidance and fluoroscopy, a single puncture was made, and access through a single tract was created through the middle posterior calyx. The staghorn calculus was broken using both pneumatic lithotripter (Swiss Lithoclast Master) and ultrasonic lithotripsy with complete clearance confirmed by fluoroscopic imaging. An anterograde DJ stent (Percuflex Plus 4.8F/26 cm) and a nephrostomy tube (16 F) were also inserted. The patient’s postoperative course was uneventful. A postoperative abdominal X-ray showed no residual stone [Figure 3]. Her nephrostomy tube was removed on the 2nd postoperative day, and she was discharged on the 4th postoperative day with stable renal function test and hemoglobin levels.

**DISCUSSION**

Since not much data exist regarding the prevalence of stones concurrently with renal AML and its management, such complicated cases are deemed as clinically challenging. From literature review, only two cases of PCNL in a patient with AML were previously reported. The first reported case was in 1994 by Kropp et al. who described PCNL access directly through an AML without intraoperative or postoperative complications and bleeding. The report suggested percutaneous approach with a Kaye balloon nephrostomy tube as reasonable management for such cases. We found the approach to be of low precision and high risk to the patient as it did not involve any form of imaging guidance. The second case, which was reported in 1999 by Eiley et al., discussed a male patient with tuberous sclerosis and history of selective renal artery embolization who was successfully managed through a three-dimensional CT-guided PCNL. However, they required the creation of a second tract to confirm stone clearance. In our case, we were able to successfully remove a large-sized stone in similar circumstances with a single tract only. Although urologists are responsible for creating the percutaneous puncture and tract in our center, we found that using radiological assistance, in the form of ultrasound guidance, to be of great benefit as it further enhanced our puncturing and access technique.
and precision. Thus, minimizing risk to the patient and any form of unnecessary radiation. Other cases of patients with large calculi and AML were also reported; however, they were managed through other modalities such as retrograde 6 flexible ureterorenoscopy and ESWL.\[5,6\]

**CONCLUSION**

PCNL is the gold standard treatment for renal stones > 2 cm; however, in conditions such as AML, the risks of performing such a procedure could outweigh its benefits, thus prompting urologists to seek other treatment options. In this case report, our technique of using ultrasound guidance to create a single puncture and working through a single tract was a safe and effective option. Therefore, we found PCNL still to be a feasible and safe option when proper radiological assistance and technique are involved.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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