CASE REPORT

Renal colic due to fatty tissue obstruction of the ureter following selective arterial embolisation of a 10 cm angiomyolipoma

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SUMMARY

A 47-year-old man was admitted for preventive embolisation of a 10 cm angiomyolipoma (AML) of the right kidney. Three weeks after embolisation, he was readmitted at the emergency unit for a right renal colic. The CT scan confirmed the obstruction of the right ureter due to the presence of fatty tissue into the lumen. Understanding fatty tissue migration into the collecting system is not simple. We hypothesised that the use of alcohol during the embolisation procedure could have led to focal necrosis of the collecting system, thus enabling migration of fatty tissue into the renal calyces.

BACKGROUND

Selective arterial embolisation of angiomyolipoma (AML) is often proposed as an alternative to surgical treatment, with the advantages of being less invasive and having lower complication rates.

Postembolisation renal colic has never before been reported in the literature. Describing all types of complications that could occur after selective arterial embolisation of AML may be of major interest to urologists and interventional radiologists as well as useful for patient counselling.

CASE PRESENTATION

A 47-year-old man was admitted at the emergency unit for a right renal colic. He had no other medical history other than a 10 cm sporadic AML of the right kidney (figures 1 and 2), which had been selectively embolised 3 weeks before. Embolisation had been preventively proposed to the patient in order to reduce the size and to prevent bleeding of the tumour. Regarding the details of embolisation, a relatively high volume of pure ethanol was administered to the patient (7 mL in total) in addition to microparticles.

INVESTIGATIONS

Microscopic haematuria was noticed. Blood tests were within the normal range including serum creatinine.

A pelvic and abdominal CT scan was performed before and after injection of a contrast agent. Dilation of the right calix and right ureter was reported upstream of an obstacle found in the lumen of the lumbar ureter. The density of the obstacle was -70 to -90 Hounsfield units and did not show any enhancement after contrast agent injection (figures 1, 3 and 4). Similar lesions were found

Figure 1 Angiomyolipoma of the upper pole of the right kidney.

in the calix. The main hypothesis was migration of fatty tissue from the AML.

DIFFERENTIAL DIAGNOSIS

The differentials included renal colic lithiasis, renal ischaemia and arterial dissection.

TREATMENT

After adequate medical treatment, the patient remained in pain, and a double J stent was set up. The patient was discharged the next day.

OUTCOME AND FOLLOW-UP

The double J stent was removed after 2 weeks. Six months later, a contrast-enhanced CT scan showed persistent vascularisation of the AML. Secondary embolisation or laparoscopic partial nephrectomy was discussed. Owing to previous complications, the patient finally chose surgery.

Figure 2 Angiomyolipoma of the right kidney after embolisation showing embolisation material inside the tumour.

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Figure 3 Fatty tissue into the renal calyces after embolisation of the angiomyolipoma of the right kidney.

DISCUSSION

AMLs greater than 4 cm are at risk of spontaneous bleeding due to abnormal thick-walled vessels in the tumour. Preventive treatment is therefore usually recommended.

The first question raised by this case report is whether arterial embolisation was an appropriate treatment. Published series of renal embolisation have demonstrated long-term efficacy of embolisation for large AMLs, with up to 29-month of follow-up.¹⁻³ According to Oesterling *et al*⁴ and Steiner *et al*,⁵ the choice of treatment should be based on both tumour size and symptoms. As renal embolisation exposes the patient to low complication rates it may be considered for the treatment of acute tumour bleeding, but also for the preventive treatment of large AMLs (>4–5 cm), as an alternative to surgery.

In their series, Ramon *et al* reported a complication rate of 11% after SAE in 100 cases; the freedom from surgical treatment at 5-year following SAE was 94%. However, other series showed less encouraging results with higher complication rates, and were only moderately effective in reducing the volume of the tumour; the European Association of Urology (EAU) recommendations still advise discussing surgery as the first treatment option.^{1 6 7}

The second question raised is whether we should warn our patients of a possible renal colic after arterial embolisation of AML. To the best of our knowledge, such renal colic due to fatty tissue migration into the collecting system has never before been reported. Nonetheless, Ishibashi *et al*⁸ already reported a case of asymptomatic lipiduria following arterial embolisation of an AML.

Disruption of the collecting system is mandatory to allow migration of fatty tissue into the calyces. The first mechanism leading to possible collecting system disruption is tumour growth itself. Limited disruption may also occur after

microparticle embolisation into small renal vessels providing blood supply to the collecting system. However, AML embolisation combines microparticles with the use of pure ethanol. Pure ethanol goes deeper into the tissues and is therefore more likely to result in a large necrosis of the collecting system, especially in case of an overdosage.

In this case, we cannot conclude which of these mechanisms led to the complication, but the use of a large volume of pure ethanol may probably explain the large papillary necrosis and the migration of relatively large pieces of fatty tissue into the collecting system.

The last question raised is whether the embolisation procedure itself could be better standardised to avoid such complications. The embolisation procedure combines polyvinyl alcohol particles, absolute ethanol, coils, microcoils and gelatin sponge as embolisation material. The interventional radiologist may use one or more of these agents to obtain complete devascularisation of the tumour. Depending on the location and on the extent of the tumour, various combinations may be proposed.

Despite this unexpected complication, selective renal embolisation remains a less invasive procedure than surgery for the treatment of renal AML, but there is a lack of a clear protocol mentioning combinations and maximum dosage of embolisation materials to be used.

Learning points

- ▶ Selective arterial embolisation is a less invasive alternative to partial nephrectomy for the management of large angiomyolipoma of the kidney.
- ▶ The disruption of the collecting system due to tumour growth or papillary necrosis after arterial embolisation is rare, but may lead to unexpected migration of tissue fragments into the collecting system.
- ▶ The embolisation procedure is well codified, but alcohol embolisation must be limited to avoid necrosis of the calyces.
- ▶ Even regarding minimally invasive procedures, patients have to be informed of complication risks.
- ▶ Complications related to minimally invasive procedures have to be systematically reported to allow better patient counselling.

Competing interests None declared.

Patient consent Obtained.

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Figure 4 Fatty tissue into the lumbar ureter after embolisation of the angiomyolipoma of the right kidney.

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