CASE REPORT

Management of a simple renal cyst in a complex patient

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SUMMARY

Renal cysts are generally classified as simple or complex and are further characterised under the Bosniak classification system. Most simple cysts are benign, asymptomatic and discovered incidentally. However, over time, these simple cysts can enlarge, become symptomatic and develop complications, requiring intervention. We present a case of a 70-year-old man with multiple comorbidities who presented with left lower quadrant abdominal pain and haematuria. An abdominal CT scan revealed a large, 26 cm exophytic cyst with high attenuation areas, septations and haemorrhage. Given the patient's tenuous condition and poor functional status, an interventional radiology-guided renal cyst aspiration was performed, resulting in successful reduction of size and symptom resolution. A follow-up ultrasound at 6 months showed no evidence of recurrence. Primary care providers should be aware of the prevalence of renal cysts and their complications, especially haemorrhage, particularly in high risk and elderly patients on anticoagulation or antiplatelet therapy.

BACKGROUND

The majority of renal cysts are simple and asymptomatic. Such cysts do not warrant follow-up imaging owing to their benign nature. However, this case illustrates the evolution of a benign renal cyst into one of colossal size, presenting with abdominal pain and eventually being complicated by life-threatening haemorrhage. The case presents a complication of renal cysts and emphasises the need for heightened vigilance, particularly among patients on anticoagulation therapy.

CASE PRESENTATION

A 70-year-old man with significant medical history for chronic kidney disease (CKD), coronary artery disease status postcoronary artery bypass grafting (CABG), congestive heart failure with implantable cardioverter-defibrillator, atrial fibrillation (on warfarin therapy), hyperlipidaemia, hypertension, hyperthyroidism and diverticulosis presented with worsening left lower quadrant abdominal pain for 2 days. The abdominal pain was throbbing, non-radiating, waxing and waning in nature and associated with gross haematuria, malaise, weakness and light-headedness. The pain was relieved on lying supine and exacerbated by exertion.

Six years ago, during work-up for CKD, an abdominal ultrasound incidentally revealed a large simple renal cyst, measuring 15.2 cm in diameter, along the lateral aspect of the left kidney.

Furthermore, no evidence of hydronephrosis or nephrolithiasis was seen. At the time, given that the patient was asymptomatic and had recently undergone CABG, the renal cyst was managed conservatively.

One month ago, the patient began experiencing left lower quadrant abdominal pain that was evaluated during an outpatient visit, with abdominal and pelvic CT scans showing a 17.6×11.5 cm left renal cyst associated with ipsilateral mild hydronephrosis and hydroureter. The patient was managed conservatively with pain medication. However, his symptoms gradually progressed, leading to the current hospitalisation.

During the current hospitalisation, the patient's physical examination was remarkable for tenderness and protrusion in the left lower abdomen, reduced air movement in the left lung base, as well as bilateral 1+ ankle oedema.

INVESTIGATIONS

Work-up in the emergency department showed mild leucocytosis (leucocyte count of 12 670/μL—92% neutrophils, 4% lymphocytes, 4% monocytes), anaemia (haemoglobin of 9.8 g/dL), international normalised ratio of 2.8, serum potassium of 6 mg/dL, blood urea nitrogen of 86 mg/dL, and creatine of 5.8 mg/dL (baseline of 2.4–2.8 mg/dL). Urinalysis showed turbid, red-coloured urine, with 3+ protein, numerous red blood cells (RBC), 15–20 white blood cells per high-power field, as well as positive nitrites and leucocyte esterase. Abdominal CT revealed a large exophytic left renal cyst (25.80×14.35×17.98 cm—figure 1), having increased in size since the previous evaluation, associated with ipsilateral hydronephrosis and hydroureter. Areas of high attenuation and septations were noted on this scan, indicating newly developed haemorrhage. In addition, the mass compressed a large majority of the renal parenchyma (figure 1). On the basis of these findings, the renal cyst was classified as a type IIF cyst under the Bosniak classification system.

TREATMENT

The patient was admitted to the medicine service and initially managed with a blood transfusion, discontinuation of anticoagulation therapy and pain management. After multidisciplinary consultation with urology, nephrology and cardiology services, the patient was considered a high risk for laparoscopic decortication owing to poor functional status and multiple comorbidities. Hence, an interventional radiology-guided percutaneous aspiration

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Figure 1 Non-contrast abdominal CT scan revealing a massive left renal cyst with high attenuation areas, prior to intervention. (A) Coronal view—dimensions are shown (25.80×14.35 cm). (B) Axial view.

of the renal cyst was performed, draining approximately 2200 cm³ of serosanguinous fluid, resulting in decompression of the cyst (figure 2).

OUTCOME AND FOLLOW-UP

The patient tolerated the procedure well and was transfused with one unit of packed RBCs postprocedure owing to a drop in haemoglobin. Cystic fluid analysis showed blood with occasional monocytes and lymphocytes, with no evidence of malignancy. The patient's complaints of pain and haematuria improved over the course of hospitalisation and he was later discharged with recommendations to follow-up in the urology clinic. The patient's symptoms continued to improve and a repeat ultrasound at 6 month follow-up showed no evidence of recurrence.

DISCUSSION

Renal cysts can be classified clinically or morphologically as simple (Bosniak type I and II) or complex (Bosniak type III and IV).¹ Most renal cysts are simple, having smooth, well-margined walls² and show no enhancement on contrast imaging.³ Simple renal cysts are usually unilateral and solitary, with an overall prevalence varying between 5% and 41%.⁴ In young individuals, simple cysts carry the potential to slowly increase in size at approximately 1.6 mm/year or 4–5% per year.⁴ The incidence of renal cysts increases with advanced age, ranging from 5% by the fourth decade to 36% by the eighth decade.⁵

Majority of renal cysts are asymptomatic incidental findings not warranting treatment. However, 6–8% of renal cysts become symptomatic and necessitate intervention,⁶ with abdominal pain being the commonest complaint.² Haematuria, hypertension, compression symptoms or mass effects, urinary tract

infections and deteriorating renal function are among other presentations.^{1 7}

Although rare, complications include haemorrhage, infection and rupture. Approximately 6% of simple cysts are complicated by haemorrhage secondary to increasing size, trauma or bleeding diathesis.⁴ Furthermore, 15–25% of haemorrhagic cysts are reported to be malignant and thus require additional work-up and surgical intervention.⁸

Imaging studies such as ultrasonography, CT and MRI are frequently employed in the diagnosis, work-up and follow-up of renal cysts. However, the CT scan is considered the primary modality in evaluating renal cysts. The combination of high-resolution imaging with greater patient acceptability makes it the ideal means of assessing and differentiating simple from complex renal cysts.⁹

Management of renal cysts is influenced by factors such as size, number, vicinity of vital organs, Bosniak classification, mode of presentation and availability of treatment options.¹ As proposed by Israel and Bosniak⁹ and Whelan,¹⁰ asymptomatic simple renal cysts (Bosniak type I and II) do not require intervention given their low risk of malignancy (<1% for type I and <3% for type II). Nevertheless, these cysts may require periodic ultrasonographic follow-up for the initial 2–3 years, particularly in younger patients with cyst diameters greater than 3 cm.¹¹ Type IIF renal cysts carry a malignancy risk of 5–10%; therefore, follow-up CT imaging is recommended in order to ascertain stability of the lesion.¹⁰ Although an evidence-based interval for follow-up imaging is not well established, Israel and Bosniak¹² propose an initial CT scan at 6 months and additional follow-up scans at yearly intervals for 5 or more years. On the contrary, type III and type IV renal cysts warrant further work-up followed by surgical intervention, given their high risk of malignancy. This risk is reported as 40–60% for type III and >80% for type IV renal cysts.¹⁰

Figure 2 Renal ultrasound showing a longitudinal view of the left kidney after interventional radiology-guided aspiration of a massive, 26 cm left renal cyst. (A) Resolution of the cyst is seen. (B) Colour Doppler showing a clot at the site of aspiration.

While partial or radical nephrectomy are considered the optimal procedures for treating type III and type IV renal cysts,^{1–10} laparoscopic decortication is usually the treatment of choice for symptomatic renal cysts, given high success and low recurrence rates.¹³ However, the procedure is associated with complications such as neuropathy, urine leakage, haemorrhage and ileus, and thus should be considered with caution among patients with poor functional status.^{7–14}

In contrast, percutaneous aspiration is currently favoured in patients not suitable for laparoscopic decortication or with high perioperative cardiac risk. Although it is less invasive and easy to perform in an outpatient setting,² the risk of recurrences is variable, reported as high as 90% in some cases.⁷ In light of the high recurrence rate relative to the laparoscopic approach, adjunctive single or multisession sclerotherapy is encouraged. However, the use of sclerosants in treating giant renal cysts poses its own complications, including intense pain of radicular distribution during cyst filling with alcohol.² Symptoms comparable with alcohol intoxication have also been reported.¹⁵ On the contrary, morbid complications related to percutaneous drainage of renal cysts without sclerotherapy have rarely been documented.⁷ Other treatment options for renal cysts include percutaneous endocystolysis, cyst drainage and open surgery.¹

With imminent population ageing and the associated increase in prevalence of cerebrovascular and cardiovascular diseases, the frequency of anticoagulant and antiplatelet drug use will likely rise. The increasing use of such medication coupled with the increased prevalence of renal cysts in the elderly make haemorrhagic complications a real concern in this population. Primary care providers should be aware of the increased risk of simple renal cysts in the elderly, as well as related life-threatening complications such as haemorrhage, particularly in patients on anticoagulation or antiplatelet therapy. A multidisciplinary approach and close follow-up are needed for the management of such patients with complex medical comorbidities.

Competing interests None.

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REFERENCES

- 1 Agarwal MM, Hemal AK. Surgical management of renal cystic disease. *Curr Urol Rep* 2011;2011:3–10.
- 2 Okeke AA, Mitchelmore AE, Keeley FX Jr, *et al.* A comparison of aspiration and sclerotherapy with laparoscopic de-roofing in the management of symptomatic simple renal cysts. *BJU Int* 2003;92:610–13.
- 3 Israel GM, Bosniak MA. An update of the Bosniak renal cyst classification system. *Urology* 2005;66:484–8.
- 4 Eknayan G. A clinical view of simple and complex renal cysts. *J Am Soc Nephrol* 2009;20:1874–6.
- 5 Naoki T, Kentaro I, Yosuke M, *et al.* A natural history of simple renal cysts. *J Urol* 2002;167:21–3.
- 6 Busato WFS Jr, Bettega LB. Percutaneous endocystolysis, a safe and minimally invasive treatment for renal cysts: a 13-year experience. *J Endourol* 2010;24:1405–10.
- 7 Mohsen T, Gomha MA. Treatment of symptomatic simple renal cysts by percutaneous aspiration and ethanol sclerotherapy. *BJU Int* 2005;96:1369–72.
- 8 Hartman DS, Davis CJ Jr, Johns T, *et al.* Cystic renal cell carcinoma. *Urology* 1986;28:145–53.
- 9 Israel GM, Bosniak MA. How I do it: evaluating renal masses. *Radiology* 2005;236:441–50.
- 10 Whelan TF. Guidelines on the management of renal cyst disease. *Can Urol Assoc J* 2010;4:98–9.
- 11 Terada N, Arai Y, Kinukawa N, *et al.* The 10-year natural history of simple renal cysts. *Urology* 2008;71:7–11.
- 12 Israel GM, Bosniak MA. Follow-up CT of moderately complex cystic lesions of the kidney (Bosniak category IIF). *AJR Am J Roentgenol* 2003;181:627–33.
- 13 Thwaini A, Shergill IS, Arya M, *et al.* Long-term follow-up after retroperitoneal laparoscopic decortication of symptomatic renal cysts. *Urol Int* 2007;79:352–5.
- 14 Cadeddu JA, Wolfe JS Jr, Nakada S, *et al.* Complications of laparoscopic procedures after concentrated training in urological laparoscopy. *J Urol* 2001;166:2109–11.
- 15 Zerem E, Imamovic G, Omerovic S. Symptomatic simple renal cyst: comparison of continuous negative-pressure catheter drainage and single-session alcohol sclerotherapy. *AJR Am J Roentgenol* 2008;190:1193–7.

Learning points

- ▶ Although largely subclinical, simple renal cysts can increase in size over time and may present as abdominal pain, haematuria, hypertension, mass effects, urinary tract infections and uraemia.
- ▶ CT scan is the imaging modality of choice to diagnose, classify and follow-up renal cysts.
- ▶ The progressive growth of renal cysts, coupled with trauma or bleeding diatheses, may make patients susceptible to complications such as haemorrhage. All anticoagulation and antiplatelet therapy should be held for patients with symptomatic renal cysts till haemorrhage has been ruled out.
- ▶ For poor surgical candidates, interventional radiology-guided percutaneous drainage without adjunctive sclerotherapy can be considered a viable treatment option.
- ▶ Although asymptomatic simple renal cysts are not routinely followed-up with imaging studies owing to their benign nature, increased vigilance must be exercised in patients at high risk of complications.

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