CASE REPORT

Spontaneous renal infarct heralding bowel ischaemia in an adult male: lessons to learn from a rare clinical association

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Accepted 25 February 2018

SUMMARY

Spontaneous renal artery dissection (SRAD) is a rare entity with less than 200 cases reported in literature. It usually affects middle-aged men and the clinical presentation is non-specific. Many times it is associated with conditions such as hypertension, fibromuscular dysplasia or vasculitides. We report the case of a patient who initially had renal infarct due to SRAD and then progressed to have bowel ischaemia. The renal infarct preceded bowel ischaemia in this patient and to the best of our knowledge this is the first such association reported in literature. Our report emphasises the point that whenever this condition is diagnosed in a patient one should be vigilant for other vascular disorders.

BACKGROUND

Patients complaining of flank pain are commonly seen in our emergency departments. Renal colic is the most common diagnosis made. There are many differential diagnoses in these cases, but spontaneous renal artery dissection (SRAD) is a rare possibility. This is a serious condition, but a combination of having very common clinical presentation and more relevant differential diagnoses make SRAD a remote possibility in the emergency physician's mind. In fact many of them are unaware of this condition. We present the case of a patient with SRAD who also had concomitant bowel ischaemia.

CASE PRESENTATION

A 48-year-old man presented to the emergency department with pain in his right flank for 2 days. The pain was continuous, dull aching in nature. An ultrasonography was carried out, which was suggestive of a hypoechoic area in the middle and lower poles of the right kidney. The patient was haemodynamically stable so he was given parenteral analgesics and a contrast-enhanced CT (CECT) scan was done the next day. CECT revealed an infarct involving the middle and lower poles of the right kidney (figure 1) with no other associated abnormality. The patient was then transferred to the inpatient ward for monitoring and was further investigated. The patient did fine on conservative management with intravenous analgesics and cefazolin as the prophylactic antibiotic. On follow-up ultrasonography there was no increase in size of the infarct. He was relieved symptomatically and was subsequently discharged. Two weeks

later he presented to the emergency department with continuous fever and right flank pain since 2 days. He had also developed a necrotic patch on his right flank (figure 2). On examination he was found to have a distended abdomen with diminished bowel sounds. His cardiac and respiratory examinations were unremarkable. He was admitted and broad-spectrum intravenous antibiotics were started.

INVESTIGATIONS

His total leucocyte counts (TLCs) were $16.5 \times 10^9/L$ with a shift to the left and serum creatinine was 1.6 mg/dL. A repeat CECT scan was done after proper hydration. The scan was suggestive of an increase in size of the renal infarct which now also involved the upper pole of the right kidney (figure 3), along with a filling defect in the right renal artery, suggesting a diagnosis of SRAD (figure 4). On the arterial phase of CECT scan the aorta was normal in appearance. Additionally, he was found to have large bowel oedema and mild ascites. The patient's ECG did not show any specific changes. The patient's condition deteriorated, and he developed tachypnoea and abdominal pain. On the third day his TLC increased to $22\,000/mm^3$ and he went into septic shock, for which vasopressor (norepinephrine) was started.

TREATMENT

The patient was initially started on low molecular weight heparin (LMWH) as SRAD was suspected. He was planned for invasive renal angiography and possible stenting of the affected renal artery but the patient developed features of peritonitis and was suspected to have bowel ischaemia (because he had bowel oedema on CECT) so it was decided that exploratory laparotomy be carried out. The patient was taken to the operating room on vasopressor support. Intraoperatively it was found that the whole of the distal ileum and a part of the proximal ileum was gangrenous, along with a portion of the proximal large bowel. The gangrenous segment was resected and an end ileostomy was done. As the ends of the bowel were oedematous, the patient was not a candidate for primary anastomosis. Debridement of the necrotic patch on the right flank was also carried out. Postoperatively LMWH was continued.

To cite: Pandey S, Aggarwal A, Kumar M, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-223745

Figure 1 Contrast-enhanced CT scan showing an infarct at the middle and lower poles of the right kidney.

OUTCOME AND FOLLOW-UP

In the postoperative period the patient continued to be on ventilator and vasopressor support. He progressed to multiple organ dysfunction syndrome and expired on the fifth postoperative day.

DISCUSSION

SARD is rare and has a vague clinical presentation. Thus this diagnosis is missed many times.¹ Patients with this condition commonly present with flank pain. Although a wide spectrum of clinical presentations has been reported in literature ranging from simple colicky pain to uncontrolled hypertension with or

Figure 2 Necrotic patch on the patient's back.

Figure 3 Contrast-enhanced CT scan showing increase in the size of right renal infarct (which now also involved the upper pole).

without renal failure,² hypertension is the most common clinical clue that may make one suspect this diagnosis.³ Classically men are more affected than women, with the male to female ratio reported to be between 4:1 and 10:1 in various studies.^{4,5} Typically middle-aged men are most commonly affected and they usually do not have any cardiovascular risk factors. Some authors have reported that the left kidney is more affected than the right kidney owing to the anatomical characteristics of the left renal artery that make it more susceptible to dissection. It is hypothesised that the longer length of the right renal artery lets it distribute sheer stress more evenly, protecting it from dissection.^{6,7} Around 10%–15% of SRADs are bilateral. When bilateral disease is seen then an underlying arterial disease should be suspected.^{8,9} There is a high prevalence of fibromuscular dysplasia in patients with SRAD. SRAD can also occur in normotensive people, usually after vigorous exercise. This is attributed to the greater degree of stretch on the renal artery leading to intimal tear.¹⁰ Renal ultrasound and Doppler have a poor sensitivity for diagnosing SRAD. Angiography is the gold standard for diagnosing SRAD. CT angiography (which is a non-invasive diagnostic modality) is the best way to diagnose this condition as conventional angiography is invasive and MR angiography is expensive and also not readily available everywhere.¹¹ There are no definitive guidelines for the treatment of this condition.

Figure 4 Contrast-enhanced CT scan of the patient showing filling defect in right renal artery (blue arrow) suggestive of infarct due to spontaneous renal artery dissection.

There are less than 200 cases reported in literature, some of them treated by endovascular interventions and others managed conservatively with analgesics, antihypertensives, anticoagulants and antiplatelets.^{12 13} Excellent outcomes have been reported with conservative medical management, but the experience is limited to a few cases only.^{14 15} A reasonable approach would be to give a trial of medical therapy with close monitoring of the patient and switching over to endovascular interventions if the patient's disease progresses. But some authors strongly advocate early endovascular interventions and consider this crucial for the salvage of renal function.¹⁶ Surgical interventions have a limited role and surgical revascularisation procedures have a high nephrectomy rate approaching around 40%.^{2 17}

Although SRAD has frequently been associated with fibromuscular dysplasia, atherosclerosis and other vasculitides, it has never been reported in association with bowel ischaemia. As various vasculopathies are associated with SRAD, probably an underlying vasculopathy may have been responsible for both the SRAD and the associated bowel ischaemia in our patient. A post-mortem examination would have been valuable to confirm our diagnosis and find the underlying cause but the patient's relatives did not give consent for it. This association is extremely rare and is probably the first such case reported in literature.

Learning points

- Spontaneous renal artery dissection (SRAD) has a non-specific presentation, but it may be suspected in a patient having features suggestive of renal infarct on ultrasonography with no other possible explanation for his symptoms, and can be confirmed by CT angiography.
- Though SRAD may be a solitary diagnosis, many times it is associated with fibromuscular dysplasia, atherosclerosis and other vasculitides.
- Most of the cases with SRAD can be managed with medical therapy.
- One should keep a close watch for other vascular disorders in patients with renal infarct associated with SRAD, as our case developed peritonitis due to bowel ischaemia, and early identification of this condition could have prevented the mortality.

Contributors SP conceived the case report. SP and AA were major contributors towards writing the manuscript. MK, SS and SP treated the patient and also

interpreted the patient data. SP and SS were involved in the review. All authors read and approved the final manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES

- 1 Pellerin O, Garçon P, Beyssen B, *et al.* Spontaneous renal artery dissection: long-term outcomes after endovascular stent placement. *J Vasc Interv Radiol* 2009;20:1024–30.
- 2 Mudrick D, Arepally A, Geschwind JF, *et al.* Spontaneous renal artery dissection: treatment with coil embolization. *J Vasc Interv Radiol* 2003;14:497–500.
- 3 Smith BM, Holcomb GW, Richie RE, *et al.* Renal artery dissection. *Ann Surg* 1984;200:134–46.
- 4 Béroniade V, Roy P, Froment D, *et al.* Primary renal artery dissection. *Am J Nephrol* 1987;7:382–9.
- 5 Edwards BS, Stanson AW, Holley KE, *et al.* Isolated renal artery dissection, presentation, evaluation, management, and pathology. *Mayo Clin Proc* 1982;57:564–71.
- 6 Civy AM, Seguin P, Frouget T, *et al.* Dissection bilatérale traumatique des artères rénales Bilateral traumatic dissection of the renal arteries. *Annales Françaises d'Anesthésie et de Réanimation* 2008;27:727–30.
- 7 Carrillo EH, Bergamini TM, Miller FB, *et al.* Abdominal vascular injuries. *J Trauma* 1997;43:164–71.
- 8 Lacombe M. Isolated spontaneous dissection of the renal artery. *J Vasc Surg* 2001;33:385–91.
- 9 Mori H, Hayashi K, Tasaki T, *et al.* Spontaneous resolution of bilateral renal artery dissection: a case report. *J Urol* 1986;135:114–6.
- 10 Lee SH, Lee HC, Oh SJ, *et al.* Percutaneous intervention of spontaneous renal artery dissection complicated with renal infarction: a case report and literature review. *Catheter Cardiovasc Interv* 2003;60:335–8.
- 11 Alamir A, Middendorf DF, Baker P, *et al.* Renal artery dissection causing renal infarction in otherwise healthy men. *Am J Kidney Dis* 1997;30:851–5.
- 12 Casciani E, Poletini E, Masselli G, *et al.* Spontaneous renal artery dissection diagnosed by unenhanced magnetic resonance angiography: case report. *Urol Int* 2012;89:486–8.
- 13 Shmorgun D, Claman P, McGregor P, *et al.* Renal artery dissection during an in vitro fertilization/intracytoplasmic sperm injection cycle. *Fertil Steril* 2009;92:1498.e1–1498.e3.
- 14 Abdel-Kerim A, Cassagnes L, Alfidja A, *et al.* Management of isolated non-traumatic renal artery dissection: report of four cases. *Acta Radiol* 2012;53:401–5.
- 15 Misrai V, Peyromaure M, Poirée S, *et al.* Spontaneous dissection of branch renal artery: is conservative management safe and effective? *J Urol* 2006;176:2125–9.
- 16 Renaud S, Leray-Moragès H, Chenine L, *et al.* Spontaneous renal artery dissection with renal infarction. *Clin Kidney J* 2012;5:261–4.
- 17 Peynircioglu B, Pişinkaya S, Özer Ç, *et al.* Isolated spontaneous renal artery dissection: diagnosis and endovascular management. *Diagn Interv Radiol* 2011;17:101–4.

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