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Case Report

Spontaneous Renal Artery Pseudoaneurysm Rupture with No Precipitating Risk Factor Presenting as Acute Abdomen

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Abstract

Renal artery pseudoaneurysm is a rare complication of renal interventional procedures. This has been reported following open, endoscopic and percutaneous renal procedures. The associated hematoma forms outside the arterial wall and is typically surrounded by a layer of fibrous inflammatory tissue and blood clot. These lesions are unstable and their rupture can lead to life-threatening hemorrhage.We present a case of a spontaneous renal artery pseudoaneurysm presenting with acute abdominal pain and anemia.

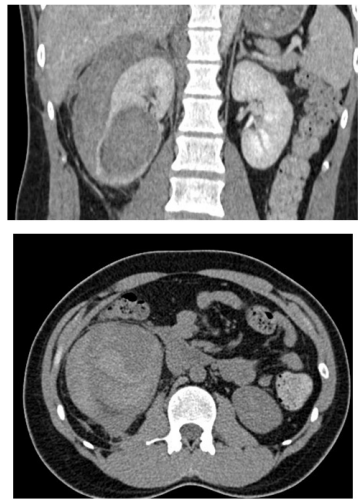
Keywords:

Acute abdomen; Renal artery pseudoaneurysm

Case

A 29-yearold man of Asian origin was admitted with constant abdominal pain localized to the right upper quadrant with no radiation. There was no history of fever, haematuria, diarrhea, vomitingor trauma. He had no significant past medical or family history. He had been a life-long non-smoker and had no known drug allergies. On examination, his vital observations and chest examination were normal. His abdomen was soft on palpation and right upper quadrant tenderness was elicited with no signs of peritonism.

Erect chest and abdominal radiographs were unremarkable. Serum biochemistry showed normal renal and liver function while full blood count (FBC) showed leucocytosis (total white cell count 21.3 x10^9/L) and normocytic anaemia (Haemoglobinconcentration 10.2 g/dL). Urine dipstick showed trace of protein only. Computed Tomography (CT) scan (contrast-enhanced) of the abdomenand pelvis showed a mixed attenuation lesion associated with a large perinephric haematoma (Figure 1,2).



Figures 1 and 2: Coronal and axial reconstructions of the contrast enhanced CT showing the mixed attenuation right lower kidney lesion and a large adjacent perinephricsubcapsularhaematoma.

The patient was initiated on intravenous antibiotics on the assumption that patient had hemorrhagic cyst with superadded infection.

After 48 hours, the patient remainedapyrexial and pain was well-controlled while inflammatory markers improved. Four days following admission, the patient experienced recurrence ofright upper abdominal pain. Repeat blood tests showed a significant drop in the Haemoglobinto 6.3 g/dL. After resuscitation and blood transfusion, a repeat CTscan (contrast enhanced) suggesteda pseudoaneurysm in the inferior branch of the right renal artery (Figure 3).

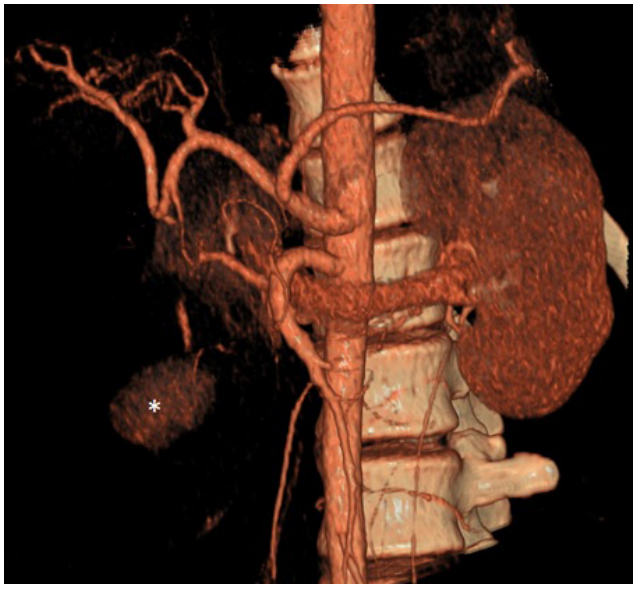


Figure 3: Three-dimensional CT reconstruction of the abdominal aorta and the renal vessels. Note the pseudoaneurysm in the right lower renal pole (asterisk).

The patient immediately underwent selective renal angiographyconfirming the presence of a bleeding 5.1 x 3.7 cm right renal artery pseudoaneurysm, which was embolised successfully with two platinum coils (Figure 4,5 & 6).

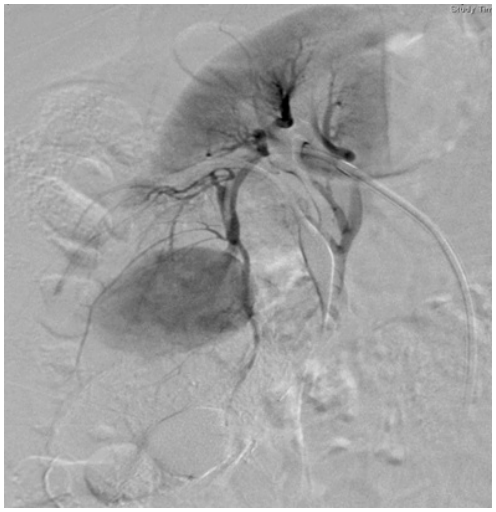


Figure 4: Renal arteriogram immediately prior to pseudoaneurysm embolization.

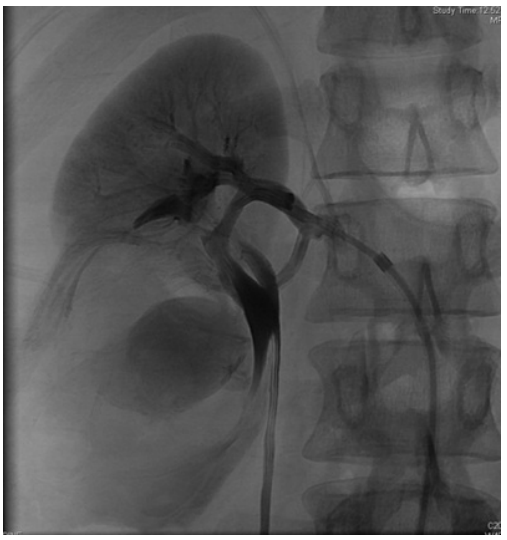


Figure 5: DSA with no subtraction clearly shows the pseudoaneurysm amidst the right kidney lower moiety haematoma compressing and medially displacing the collecting system.

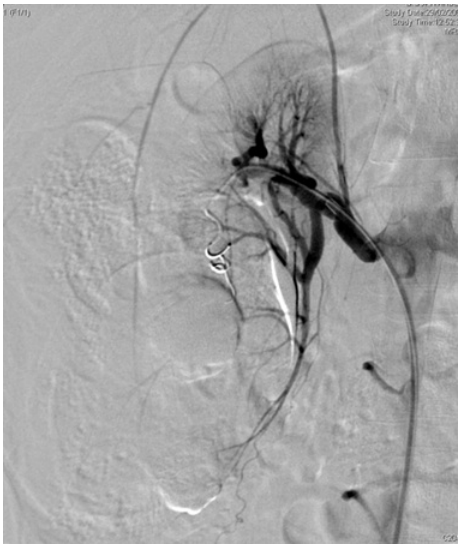


Figure 6: Final DSA after the placement of the second platinum coil shows complete exclusion of the pseudoaneurysm with redistribution of the blood circulation and consequent visualization of the renal capsule branch with haematoma related renal capsule distension.

The patient was monitored for further 48 hours during which his pain improved, Haemoglobinlevels remained stable and was discharged from hospital.Anti-nuclear antibody (ANA) and anti-neutrophil cytoplasmic antibody (ANCA) tests were negative. An MRI scan of his head did not show any vascular abnormalities. Repeat CT scan at 3 months showed significant reduction in the size of the perinephric haematoma whilst the CT scan and the ultrasound at 7 months and 19 months respectively (Figure 7).

Showed almost complete resolution.Both the follow up CT and ultrasound showed good recovery of the right kidney with good residual right kidney parenchymal reserve. The patient remained asymptomatic at 12-month follow up with normal blood pressure and was discharged to his GP.

Discussion

Arterial aneurysms can be divided into true or false aneurysms (pseudoaneurysm). A true aneurysm involves all arterial wall layers while a pseudoaneurysm is a haematoma contained by the surrounding structures outside the vessel wall. Renal artery aneurysm is rare and was first described by Rouppe in 1770 [1]. An aneurysm of the renal artery is defined as a segment of the artery with double the diameter of the normal.They occur in both men and women but the incidence of rupture ishigher in women, especially if they are pregnant. Renal artery pseudoaneurysm has been reported as a result of blunt trauma [2] or deceleration [3] injury and following urological interventions such aspartial nephrectomy [4], percutaneous nephrolithotomy (PCNL) [5], renal biopsy [6], ureterorenoscopy (URS) for laser lithotripsy [7] and following renal transplantation [8]. Our case was unusual as there was no predisposing event associated with the renal artery pseudoaneurysm and subsequent rupture.

Renal artery aneurysms can be classified into four basic types: saccular, fusiform, dissecting and intrarenalwith the saccular type constituting approximately 75% of all aneurysms [9]. Secondary atherosclerotic degeneration or intramural calcification is not uncommon. Presence of a ring-like calcification on plain abdominal radiography should raise the suspicion for diagnosis of renal artery pseudoaneurysm as these are present in approximately half of cases [10]. Incompletely calcified saccular aneurysms can be soft and thin between calcified zones; therefore these are at high risk of spontaneous rupture or eroding into vein to form an arteriovenous malformation [10]. Symptoms can include flank pain, hypertension, haematuria, rupture, ischemia or obstructive uropathy.

Renal artery aneurysms can be diagnosed by various imaging modalities including duplex ultrasound, CT scan, MR angiography and arteriography. Arteriography is useful in delineating anatomy but is used only in cases requiring intervention due to its invasive nature. In our case, the CT-scan raised the possibility of right renal artery aneurysm, which was confirmed and treated by angiography.

Treatment options include conservative, minimally invasive and open surgical options. Well-calcified renal arterial aneurysms that are asymptomatic or < 2 cm can be managed conservatively with serial imaging to ensure no change in size. In iatrogenic injuries where conservative management fails, transarterialembolisation is recommended followed by repeat intervention if required [11]. In the elective setting, surgical intervention for renal artery aneurysm is indicated in symptomatic patients (pain or haematuria), hypertension or renal ischaemia, dissecting aneurysm, women of child-bearing age who are likely to conceive, radiographic evidence of aneurysm expansion or aneurysm containing thrombus detectable on angiography with evidence of distal embolisation [10]. Minimally invasive/endovascular interventions include balloon occlusion, vascular stenting orembolisation with detachable coils/balls or gel foam. The surgical methods areopen repair, angioplasty, bypass of the aneurysm and nephrectomy. The endovascular embolisation with gel foam/platinum coils is now the treatment of choice and helps to control or prevent bleeding in > 80% of patients [12].

Conclusion

Renal artery pseudoaneurysms are rare but are well described following urological or radiological interventions to the kidney or as a result of trauma.Rupture of a renal aneurysm can cause catastrophic blood loss but can be treated, eitherby minimally invasive or open methods. In patients who present with renal angle pain and unexplained blood loss, especially with history of previous urological interventions, the differential diagnosis of renal artery pseudoaneurysm should be considered. To the best of our knowledge this is the first report of a spontaneous renal artery pseudoaneurysm rupture with no predisposing event and was managed by selective arteriography and embolisation using platinum coils.

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