

CASE REPORT

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A rare cause of pain abdomen—renal artery thrombosis with renal infarct

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Abstract

We report here a case of 56-year-old male presented to emergency with acute onset severe abdominal pain in right lumbar region and with significant past history diabetes mellitus and ischemic heart disease on regular medication, investigation revealed deranged urea and creatinine, and ultrasound abdomen and pelvis and computed tomography abdomen and pelvis showed no significant abnormalities; in view of persistent symptoms, computed tomography angiogram was done which revealed multiple right renal infarct, secondary to renal artery thrombosis. Renal angiogram revealed right renal segmental artery thrombus, which was successfully treated by catheter-directed thrombolysis and anticoagulants. Post thrombolysis symptoms and renal parameters improved.

Introduction

Acute renal artery thrombosis is medical emergency and is a rare cause of pain abdomen. Most of the renal artery thromboemboli is cardiac in origin or secondary to injury to renal vascular endothelium. Occlusion of main branch or segmental branch of renal artery leads to renal infarct and impairment in renal function. Clinically, it is difficult to diagnose renal artery thrombosis and needs radiological investigation to confirm the diagnosis.

Case

A 56-year-old male presented to emergency department with history of pain in right lower abdomen since 2 h, colicky type, nonradiating, and not associated with burning micturation, vomiting, or loose stools. No history of reduced urine output, hematuria, and trauma. No history

of vomiting and loose stools. Past history of diabetes is since 10 years, ischemic heart disease status post percutaneous coronary angiogram and stenting 10 years back, and is on insulin mixtard, aspirin, and atorvastatin medication regularly at present and no significant family and personal history noted.

Physical examination revealed vitals as follows: pulse: 60 bpm, blood pressure: 100/74 mmHg, temperature: 98 F, SpO₂: 98% at room air, and random blood sugar: 405 mg/dl.

Per abdomen examination was soft, tenderness present in right lumbar region, no palpable organomegaly, and other systemic examination was unremarkable.

Investigations showed the following: hemoglobin — 13 g%, total count of 7400 cells/mm³, liver function test — normal, urea: 45 mg/dl, creatinine — 1.6 mg/dl, and HbA_{1c} (glycated hemoglobin): 11.4%. ECG showed normal sinus rhythm no ST-T changes. Ultrasound abdomen and pelvis showed mild mucosal prominence of bowel loops in right lumbar region and mild left pleural effusion. Computed tomography abdomen and pelvis was normal. In view of persistent symptoms, computed tomography abdomen with intravenous contrast was done which showed nonenhancing right renal infarct in upper and interpole parenchyma. Computed tomography renal angiophase revealed the following: upper pole segmental artery thrombosis (Fig. 1A and B). 2D echo

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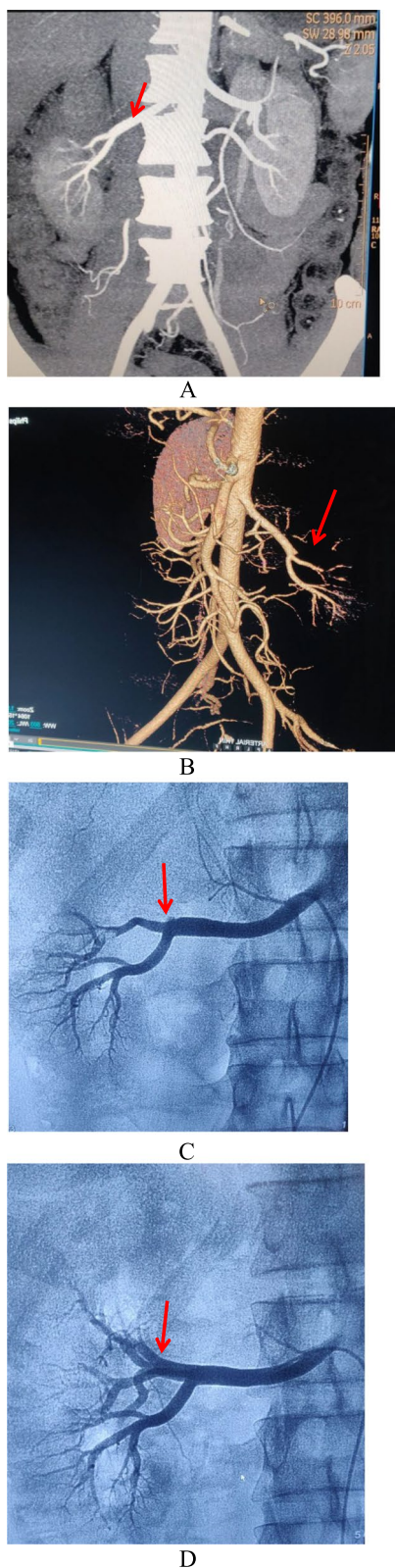


Fig. 1 **A** Nonenhancing right renal infarct in upper and interpole renal parenchyma and right upper pole segmental renal artery thrombosis. **B** CT angiogram-3D image — showing right segmental renal artery thrombosis. **C** Renal angiogram showing right upper pole segmental artery thrombosis and catheter-directed thrombolysis. **D** Post thrombolysis resolution of clot

revealed EF-42%, akinetic interventricular septum, and mild mitral regurgitation.

Diagnosis of renal artery thrombus with acute kidney injury was made, case is discussed with nephrologist and interventional radiologist, patient is treated by catheter-directed thrombolysis (Fig. 1C) with streptokinase 2.5 lakh units bolus followed by infusion 1 lakh/h for 24 h, post thrombolysis angiogram was repeated which showed resolution of clot and complete filling of upper segmental branch of renal artery (Fig. 1D) and started on nicoumalone, his blood glucose levels are controlled with basal bolus regimen of insulin, and prophylactic antibiotics are given for 5 days.

Repeat urea and creatinine were 38 mg/dl and 1.5 mg/dl after 2 days of thrombolysis, and patient was stable and was discharged with oral medications nicoumalone, aspirin and atorvastatin, carvidilol, and basal bolus regimen of insulin.

Discussion

Acute renal artery thrombosis is a rare condition, which may lead to acute kidney injury and hypertension rarely. Renal artery thrombus is normally seen in postmortem cases up to 1.4% of general population among which < 1% cases are symptomatic [1]. It is estimated that incidence of renal infarction who presents to emergency department is < 0.007%. Bilateral renal artery thrombosis is seen in 16% cases. Renal artery is least common site for thrombosis < 2%, most common being peripheral arteries — 61%, followed by mesenteric arteries — 29%, pelvic arteries — 9%, and aorta — 7% [2]. It is most commonly seen in middle age group of 30–50 years.

Approximately, 70–75% of acute kidney injury are due to prerenal causes and acute tubular necrosis. Renal artery thrombosis is seen in only 1% of acute kidney injury cases. Renal artery thrombus can be due to blood or cholesterol clot.

In the present case, cardiac origin of thrombus was suspected due to the presence of akinetic interventricular septum; however, no arrhythmia was noted.

Risk factors for renal artery thrombus/embolism are as follows:

1. Thromboembolism — cardiac causes: atrial fibrillation, myocardial infarction, plaque rupture, atrial myxoma, and bacterial endocarditis

2. Trauma
3. Aortic dissection
4. Iatrogenic
5. Hypercoagulability disorders
6. Sickle cell anemia
7. Cocaine use and fibromuscular dysplasia
8. Post renal transplantation [3].

The most common clinical presentation is flank pain/diffuse pain abdomen, followed by nausea and vomiting.

Investigations to confirm diagnosis are as follows: complete blood count, urea, and creatinine to look for acute kidney injury.

CT abdomen and pelvis may reveal the following:

- a. Edematous kidney
- b. Patchy enhancement or nonenhancing areas in kidney
- c. Wedge-shaped infarct

CT angiogram will show hypodense thrombus in lumen with attenuation of distal branches.

Treatment

1. The first step is to initiate anticoagulation with heparin and interventional radiologist opinion for local thrombolysis.
2. The second step is to treat underlying cause for thrombus formation [4].

Renal artery thrombosis patient can have mild hematuria and proteinuria, but it is most commonly seen in patients with renal vein thrombosis [5].

- Anticoagulation: Heparin to be started as bolus followed by coumadin therapy and INR to be maintained 2.0–3.0.
- Thrombolysis/thrombectomy: Many case reports have shown local thrombolysis/thrombectomy is beneficial rather than open surgery which is indicated only if there are other problems indicating the need for surgery.

Thrombolysis/thrombectomy is useful for acute occlusions of main renal artery or significant branch occlusion [6]. Thrombolysis can be done until 48 h after onset of symptoms unlike in ischemic stroke window period for thrombolysis being <4.5 h.

Systemic thrombolysis can also be considered in severe cases and if there is no contraindication for thrombolysis. The patient is to be continued on oral anticoagulants

for at least 6 months post episode. Hematuria is seen in 45–74% patients; however, it may be a late feature [7].

Prognosis

Prognosis depends on size of thrombus and percentage of vessel occlusion. Most common complication in renal artery thrombus is renal infarction; refractory hypertension is seen rarely. About 8% of cases will have progressive worsening of renal function, which result in initiation of dialysis [4].

Conclusion

Renal artery thrombosis should be considered in patients presenting with pain abdomen and the presence of risk factors for thromboembolism. Early detection and treatment by thrombolysis/anticoagulant therapy will prevent from renal infarction.

Abbreviations

FIG	Figure
CT	Computed tomography
ECG	Electrocardiogram
Echo	Echocardiography

Authors' contributions

SD- Primary doctor to who has seen patient and diagnosed. VKS- Cardiologist who has done catheter directed thrombolysis to the patient. RSVK- Nephrologist who has been the decision maker. NS- Emergency physician and guidance. HM- Supporting in team.

Competing interests

The authors declare that they have no competing interests.

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References

1. Naiding Z, Guiyi X, Yifeng P, Changming S, Jian W, Bing C, Zhenjie L (2019) Acute renal artery thrombosis treated with combination use of multiple interventional techniques. *J Cardiovasc Med Cardiol* 6:088–091
2. Nandwani A, Pathania D, Jha PK, Kher V (2017) Renal artery thrombosis with renal infarction: a rare cause of acute abdomen. *Indian J Nephrol* 27(4):313
3. Ha P, Sharma R, Davtyan L et al Renal artery occlusion (acute). Reference article, Radiopaedia.org (Accessed on 28 Jan 2023)
4. Sauerberg N, Khan YS (2022) Renal artery thrombosis. StatPearls. StatPearls Publishing, Treasure Island Updated 17 Oct 2022
5. Longo D, Harrison T (2021) Harrison's manual of medicine, 21st edn. McGraw-Hill Medical, New York
6. Lopez VM, Glauser J (2010) A case of renal artery thrombosis with renal infarction. *J Emerg Trauma Shock* 3(3):302
7. Koivuviita N, Tertti R, Heiro M, Manner I, Metsärinne K (2014) Thromboembolism as a cause of renal artery occlusion and acute kidney injury: the recovery of kidney function after two weeks. *Case Rep Nephrol Dialysis* 4(1):82–87

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