

CASE REPORT

Renal Infarction following Asymptomatic Aortoiliac Thrombosis as a Cause of Severe Flank Pain; a Case Report

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Abstract: Renal infarction is rare and may be considered acute renal colic in presentation. In this report, we describe a case of renal infarction caused by thrombosis that extended from the aortoiliac to the infrapopliteal segment, along with thrombosis that occurred in the right popliteal artery and left atrium. A 48-year-old man was referred to the emergency department (ED) suffering left flank pain. The pain was significant with radiation to the left lower quadrant, and the pain did not significantly decrease despite intravenous ketorolac and morphine sulfate administration. We decided to perform a color Doppler ultrasound test of intraabdominal vessels that revealed low flow in the left iliac artery. By computed tomography angiography (CTA), it was confirmed that the left renal, iliac, and popliteal arteries were thrombosed. The patient underwent anticoagulation, thrombectomy, and Mitral valve replacement surgery during the hospitalization. After 14 days, his heart rhythm returned to normal sinus and he was discharged from the hospital with proper outpatient follow-up. Patients with severe flank pain and who do not respond to routine treatments, especially patients with significant risk factors, should be evaluated more carefully for red flag diagnosis.

Keywords: Flank pain; Renal artery thrombosis; Atrial fibrillation; Valvular disorders

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1. Introduction

Renal artery thrombosis is rare but serious, with a prevalence of 0.02/1000 in the medical literature (1, 2). The most common complaint in the emergency department (ED) is flank or abdominal pain, which is often underdiagnosed (3), especially in patients with risk factors such as aging, cardiovascular disease, previous thromboembolic events, and chronic atrial fibrillation, trauma, and valve interventions (4-6). We report a case of flank pain due to renal infarction concomitant with aortoiliac to infra-popliteal segment thrombosis.

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2. Case presentation

A 48-year-old man with left flank pain from 8 hours ago was referred to the ED from a nephrology clinic for urologic assessment. Based on his appearance and a sonography scan from a month ago indicating a kidney stone, he most likely suffered from renal colic.

The pain was significant with radiation to the left lower quadrant (VAS Score reported 10) and severe. The pain did not significantly decrease despite 30 mg intravenous ketorolac and 10 mg intravenous morphine sulfate. He did not report dysuria, fever, or chills. At the physical examination, vital signs were in normal ranges. He seemed anxious, and he had a sickly aspect. Discomfort on the left side of the costovertebral angle and left lower abdominal soreness and rebound tenderness was found during the abdominal examination. Fentanyl 100 microgram was intravenously initiated, and routine blood tests, including complete blood cell, renal function test, and simple urine analysis, were requested.

He had a history of intradiscal steroid injection for low back

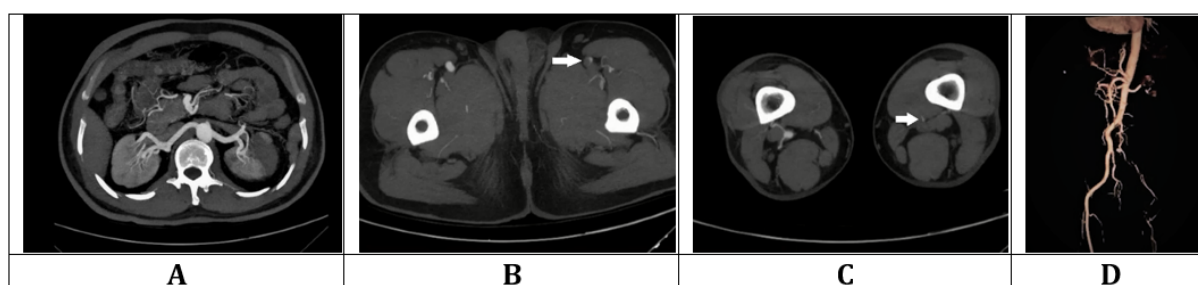


Figure 1: Renal artery thrombosis and renal infarction (A); Left femoral artery with low blood flow (B); Left popliteal artery with low blood flow (C); Abdominal aorta and bilateral lower limb Computed Tomography Angiogram; 3D reconstruction (D).

pain radiating to the left lower limb about two weeks ago due to an L3-L4 disc bulging in his lumbar MRI. The symptom related to his lower limb was not progressed, although it had been partially relieved. At the presentation, the patient had no new compliments on his lower limbs, it is also noted that the pain is not radiating to the left lower limb; there were no cyanosis, edema, size, or significant thermal differences compared to another side.

Additionally, he had a history of percutaneous transvenous mitral commissurotomy (PTMC) 25 years ago, epilepsy from 4 years ago, and a drug history of Carbamazepine and Amlodipine, lozax, and Metoral. According to his initial paperwork, the ECG showed normal sinus, and a normal ejection fraction, and moderate to severe mitral stenosis described in an echocardiography conducted approximately four months earlier. According to his statement, he took Rivaroxaban for one month based on a cardiologist's recommendation and his echocardiography result, but he stopped it for no reason three months ago.

As the symptoms were not decreased following fentanyl administration, we performed an ultrasound test again as a point of care ultrasound examination of the Abdomen. Firstly, renal ultrasound was done to detect no hydronephrosis and no stone, and the kidneys were standard size and

2.1. Diagnostic Focus and Assessment

Regarding persistent pain and arbitrary discontinuation of Rivaroxaban, we decided to perform a color Doppler ultrasound test of intraabdominal vessels as follows: It was inspected from the abdominal aorta to the bifurcation and found to be expected in size with no thrombosis or intimal flap. The color flow was detected in the right-side iliac vein and artery; the flow was seen in the left iliac vein, but there was low flow in the left iliac artery. It was discovered during a three-point lower limb color Doppler ultrasound that there was a partial clot in the left common femoral artery, left femoral artery, and popliteal artery. Considering the lack of pain in the lower extremities and the absence of limbs edema and cyanosis, the pulses were not checked initially. By more

examination, filiform pulse was detected in the left femoral and popliteal arteries. Lower toe saturation was 92% and 95 % on the left and right sides; consequently, the left lower limb was some colder than the right. ECG was performed and showed atrial flutter.

In collaboration with the surgical team, a CTA of the abdominal aorta and lower limb extremities was ordered, and intravenous heparin was provided. Partial left Renal artery thrombosis, low flow in the left femoral arteries, and left popliteal artery were detected. (Figure 1).

Echocardiography was reported: severe left atrium enlargement with 56% Ejection fraction, strict smoky pattern in the left atrium (LA), round heterogeneous mass in LA: 20×20 mm in favor of thrombosis formation, severe rheumatism mitral stenosis, dilated ascending Aorta, progressive Aortic stenosis, mild pulmonary hypertension, and previous PTMC.

Laboratory findings showed a white blood cell count of 19300 (90% Neutrophils), serum creatinine of 1.1 mg/dl, BUN of 36 mg/ dl, serum lactate dehydrogenase (LDH) of 2289 U/d, Creatine phosphokinase of 213 U/L, and international normalized ratio (INR) of 1.

2.2. Therapeutic Focus and Outcome

The patient underwent anticoagulation, thrombectomy, and Mitral valve replacement surgery during the hospitalization. After 14 days, his heart rhythm returned to normal sinus, and he was discharged from the hospital with proper outpatient follow-up.

3. Discussion

Abdominal and or flank pain is one of the most common presentations in ED. A reliable diagnosis may be reached only in 40% of patients in ED, which is often delayed up to 2 days or more (7). In a patient with risk factors and unexplained flank pain (8), renal artery thrombosis should be addressed. Cholesterol or blood-based emboli are originating from atrial fibrillation or endocarditis cause thrombogenesis in the left atrium, resulting in renal infarction (9). Extremities are the most common site of peripheral arterial thromboembolism

in patients with atrial fibrillation (61%), and the last is followed by the renal arteries (2%) (10). Physical examination is not always diagnostic; diagnostic tools like imaging modalities can increase diagnosis accuracy and repeat the physical examination in suspected cases with risk factors. Ultrasonography (US), owing to its low cost, broad availability, and no radiation, is commonly performed in abdomen pain assessment in ED (11). The US is diagnostic in only 3% of Renal artery thrombosis cases; CTA is the diagnostic modality of choice in this case.

Rheumatic heart disease (RHD) is a non-communicable disease known as an important preventable cause of cardiovascular diseases (12). Medical therapy for mitral stenosis (MS) aims to diminish rheumatic fever recurrence, pulmonary congestion symptoms (e.g., paroxysmal nocturnal dyspnea, orthopnea), infective endocarditis prophylaxis, ventricular rate control if atrial fibrillation is present, and thromboembolic events (13). Transient atrial flutter and fibrillation should be considered in the patients with mitral stenosis and sinus rhythm; these abnormal rhythms can be detected via Holter monitoring; the quality of anticoagulation and monitoring of the INR and follow-up is essential to reduce the risk of stroke, thrombosis, and significant disability in life (14).

Abdominal and flank pain should be evaluated more carefully in ED definitive diagnosis is not established, especially in the patients with significant risk factors for critical diagnosis, have severe symptoms, and do not respond to routine treatments. Emergency physicians should improve their skills in using the point of care ultrasound (POCUS) to complete examinations while repeating the physical examination more wholly and accurately (15).

Furthermore, in the patients with valvular disorders or risk factors for thrombosis, frequent follow-ups and, if necessary, Holter monitoring should be performed to identify the diseases such as transient atrial fibrillation, and oral anticoagulants should be started on time. Giving enough information to the patient about the risk of taking and leaving the prescribed medicines will increase the acceptance of the drug and reduce its side effects.

4. Conclusion

Patients with severe abdominal and flank pain and who do not respond to routine treatments, especially the patients with significant risk factors, should be evaluated more carefully.

5. Declarations

5.1. Acknowledgments

None.

5.2. Conflict of interest

The authors report no conflict of interest.

5.3. Funding and supports

This study received no extramural funding.

5.4. Authors' contributions

AP: study design and drafted the manuscript. RR: reviewed and edited. AB: reviewed, edited and preparing document for publication. All authors read and approved the final manuscript.

5.5. Ethical statement

The study protocol was approved by the Ethics committee of Zahedan University of Medical Sciences.

5.6. Informed Consent

The study was carried out by the Declaration of Helsinki (1989). Informed consent was obtained from the patient, and the patient understands that his participation is voluntary and that he is free to withdraw at any time, without giving a reason and without cost, and he voluntarily agrees to take part in this study. He understands that photographs (audio/video recordings) may be taken during the study. He consents to use his photo (audio/video) in presentations related to this study.

5.7. Availability of supporting data

The data are available from the corresponding author upon reasonable request.

5.8. Using artificial intelligence chatbots statement

This study did not involve the use of any artificial intelligence tools.

References

1. Rittenhouse DW, Chojnacki KA. Massive portal venous air and pneumatosis intestinalis associated with cocaine-induced mesenteric ischemia. *J Gastrointest Surg.* 2012;16(1):223-5.
2. Korzets Z, Plotkin E, Bernheim J, Zissin R. The clinical spectrum of acute renal infarction. *Isr Med Assoc J.* Oct 2002;4(10):781-4.
3. Lopez VM, Glauser J. A case of renal artery thrombosis with renal infarction. *J Emerg Trauma Shock.* Jul 2010;3(3):302.
4. Antopolsky M, Simanovsky N, Stalnikowicz R, Salameh S, Hiller N. Renal infarction in the ED: 10-year experience.

- rience and review of the literature. *Am J Emerg Med.* 2012;30(7):1055-60.
5. Hazanov N, Somin M, Attali M, et al. Acute renal embolism. Forty-four cases of renal infarction in patients with atrial fibrillation. *Medicine (Baltimore).* 2004;83(5):292-299.
 6. Piffaretti G, Riva F, Tozzi M, et al. Catheter-directed thrombolysis for acute renal artery thrombosis: report of 4 cases. *Vasc Endovascular Surg.* 2008;42(4):375-9.
 7. Tsai SH, Chu SJ, Chen SJ, et al. Acute renal infarction: a 10-year experience. *Int J Clin Pract.* 2007;61(1):62-7.
 8. Domanovits H, Paulis M, Nikfardjam M, et al. Acute renal infarction. Clinical characteristics of 17 patients. *Medicine (Baltimore).* 1999;78(6):386-94.
 9. Paris B, Bobrie G, Rossignol P, Le Coz S, Chedid A, Plouin PF. Blood pressure and renal outcomes in patients with kidney infarction and hypertension. *J Hypertens.* 2006;24(8):1649-54.
 10. Frost L, Engholm G, Johnsen S, Møller H, Henneberg EW, Husted S. Incident thromboembolism in the aorta and the renal, mesenteric, pelvic, and extremity arteries after discharge from the hospital with a diagnosis of atrial fibrillation. *Arch Intern Med.* 2001;161(2):272-6.
 11. Abdolrazaghnejad A, Rajabpour-Sanati A, Rastegari-Najafabadi H, Ziaei M, Pakniyat A. The Role of Ultrasonography in Patients Referring to the Emergency Department with Acute Abdominal Pain. *Adv J Emerg Med.* Fall 2019;3(4):e43. doi:10.22114/ajem.v0i0.152.
 12. Zühlke L, Engel ME, Karthikeyan G, et al. Characteristics, complications, and gaps in evidence-based interventions in rheumatic heart disease: the Global Rheumatic Heart Disease Registry (the REMEDY study). *Eur Heart J.* 2015;36(18):1115-22.
 13. Watkins DA, Johnson CO, Colquhoun SM, et al. Global, Regional, and National Burden of Rheumatic Heart Disease, 1990-2015. *N Engl J Med.* 2017;377(8):713-722.
 14. Ramsdale DR, Arumugam N, Singh SS, Pearson J, Charles RG. Holter monitoring in patients with mitral stenosis and sinus rhythm. *Eur Heart J.* 1987;8(2):164-70.
 15. Zare, M.A., Bahmani, A., Fathi, M. et al. Role of point-of-care ultrasound study in early disposition of patients with undifferentiated acute dyspnea in emergency department: a multi-center prospective study. *J Ultrasound.* 2022; 25(3):443-449.