

# Acute Renal Infarction in the Setting of Rheumatic Valvular Heart Disease & Atrial Fibrillation: A Case Report in Yemen

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**Abstract**—Acute renal infarction (ARI) is a rare cause of acute abdominal pain. It has to be expected in patients with cardiovascular risk factors. Atrial fibrillation (AF); one of the most common arrhythmias; is the most commonly identified cause of renal infarction; however, a significant number of patients are idiopathic. The low incidence and nonspecific clinical features of acute renal infarction make it difficult to diagnose, often leading to either delayed diagnosis or misdiagnosis. We report a case of acute right renal infarction due to underlying rheumatic mitral stenosis with long-standing persistent AF, on untargeted anticoagulation due to the patient's neglect. She suddenly developed intermittent, sharp right-sided flank pain and vomiting; and was found to have an acute right renal infarction on a contrast-enhanced computed tomography scan.

**Keywords**—Acute renal infarction, loin pain, AF, Mitral stenosis, Yemen

## 1-Introduction

Renal infarction is an underdiagnosed pathology that arises as a sudden interruption of

blood flow to the renal artery [1]. The prevalence of renal infarction has been estimated from autopsy studies as 14 per 1,000, but the incidence in clinical practice is probably lower since many cases are not diagnosed, as suggested by other studies in which the incidence of renal infarction in emergency departments was only 0.007% [1,2]. The etiology of acute renal infarction is usually due to thromboembolism with the source of emboli arising from the heart or the aorta. The most common disease causing it is AF [3]. The diagnosis of acute renal infarction is often missed or delayed due to both the rarity of the disease and its nonspecific clinical presentation where most cases present as an abdominal or flank pain, low-grade

fever, vomiting, leukocytosis, hematuria, and frequent elevation of lactate dehydrogenase (LDH) levels. This constellation of complaints can cause diagnostic confusion; initial diagnoses included renal colic, pyelonephritis, abdominal pain of uncertain cause, an acute mesenteric event, urinary tract infection, and biliary tract disease [4,5]. Enhanced CT imaging is the gold standard for the diagnosis of RI [6]. If the diagnosis of acute RI is missed initially or delayed, patients are at risk of renal failure, which can lead to death [4]. In this paper we highlight the clinical, laboratory, and contrast enhanced abdominal CT scan findings of acute renal infarction in an old Yemeni female patient.

## 2. Case Presentation

A 75-year-old Yemeni female presented to the emergency room (ER) with a four-day history of severe right flank pain associated with frequent attacks of nausea and vomiting primarily diagnosed and treated as a case of UTI by an out-patient doctor. She did not respond to the prescribed medications. Her medical history is significant for uncontrolled diabetes mellitus (DM), hypertension (HTN), and rheumatic heart disease (RHD) in the form of severe mitral stenosis complicated by long standing persistent AF. She was on Glimepiride 3mg, Ramipril 2.5mg, Bisoprolol 10mg, and Warfarin 3mg each once daily. She was neglected and not on regular follow-ups. Furthermore, her INR was not at the target level on Warfarin 3mg/day; her INR at admission was suboptimal (Table 1). She had 20 pack-year smoking history. Her family history was notable for coronary artery disease in her father and RHD in one of her siblings. On examination, her blood pressure and temperature were found to be normal. The only significant finding was right lower quadrant abdominal tenderness, without rebound, guarding, or rigidity of the abdomen.

Table 1: Results of laboratory tests of our case

Test	Result at admission	Result at discharge
<b>Haematologic tests</b>		
HB	18.6 g/dl	15.2 g/dl
WBC	19.5 x 10 <sup>9</sup> /mm <sup>3</sup>	7.2 x 10 <sup>9</sup> /mm <sup>3</sup>
Platelets	178 x 10 <sup>9</sup> /mm <sup>3</sup>	211 x 10 <sup>9</sup> /mm <sup>3</sup>
INR	1.7	2.5
S. K	3.7 mmol/l	4.7 mmol/l
S. Na	134 mmol/l	139 mmol/l
S. Ca	2.1 mmol/l	2 mmol/l
B.urea	38 mg/dl	32 mg/dl
S. creatinine	1.2 mg/dl	0.9 mg/dl
S. Albumin	43 mg/dl	-
LDH	620 IU/L	233 IU/L
AST	33 U/L	-
Total Bilirubin	2.8 umol/l	-
HbA1c	12.1%	-
<b>Urinalysis</b>		
Appearance	Turbid	
Protein	++	
R.B.C	Above 25	
Sugar	Positive	
Casts	Granular Casts +	

An admission electrocardiogram (ECG) revealed atrial fibrillation with controlled ventricular response. Heart rate was well controlled at 80s on oral Bisoprolol. An echocardiogram was performed and showed an ejection fraction of 40% with a left atrium diameter of 5.1 cm. There was severe mitral stenosis, mean MVA= 1.4cm<sup>2</sup> with secondary pulmonary hypertension (PASP)= 35 mmHg, and tricuspid regurgitation with elevated right ventricular systolic pressures.

Initial blood testing showed leukocytosis and elevated LDH, with all other laboratories including hemoglobin, platelet count, liver, and kidney chemistries being within the reference ranges (Table 1). Urinalysis showed microscopic hematuria, with Granular cast and proteinuria (Table 1).

A contrast-enhanced computed tomographic (CT) scan (Figures 1 & 2) of the abdomen showed hypodense lesions on the lower and mid part of the right kidney. IV anticoagulation therapy was started in addition to optimization of the dose of warfarin. The patient has been discharged to home on Warfarin 7.5mg and her other medications with marked clinical improvement.



Figure 1: Axial Contrast-enhanced CT of the abdomen with IV contrast showed large hypodense areas in the lower pole of the right kidney (Arrows).

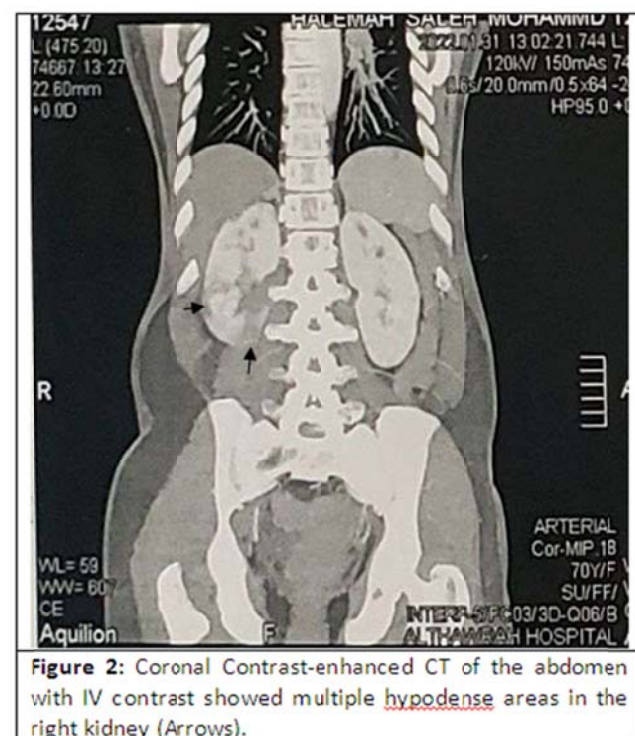


Figure 2: Coronal Contrast-enhanced CT of the abdomen with IV contrast showed multiple hypodense areas in the right kidney (Arrows).

### 3. Discussion:

Acute renal infarction is a rare event; the incidence of which is estimated to be 0.004–0.01% in hospitalized patients [7], and misdiagnosis often makes its documented incidence falsely lower than the true incidence. The origin of renal infarction is usually cardioembolic, especially due to AF [8], as seen in our case. This is followed by infective endocarditis, thrombi from suprarenal aorta, renal artery dissection, hypercoagulable status, endovascular intervention, cocaine use, sickle cell disease, or unknown etiology [9–13]. According to conventional teaching, acute renal infarction should be suspected when a patient presents with the following triad: (1) persisting abdominal or loin pain; (2) elevated serum levels of lactate dehydrogenase and/or microscopic hematuria, and (3) a high risk of thromboembolic events [14]. Our case fulfilled all the three components of the triad that lead us to suspect the diagnosis of ARI which was confirmed by an enhanced abdominal CT scan.

Additionally, laboratory tests are nonspecific in ARI. Previous reports suggested that the elevation of LDH and C-reactive protein may be helpful in diagnosis and related to prognosis [15]. In our case, serum levels of LDH were high at admission and normalized at discharge (Table 1).

## 4. Conclusion:

In summary, we report the clinical manifestations, laboratory investigations, and CT scan findings of a Yemeni girl with ARI due to Rheumatic valvular heart disease and AF.

Our case demonstrated that elevation of LDH can be used as a diagnostic characteristic for ARI in patients with acute abdominal pain and high risk for thromboembolism, so high index of suspicion is warranted in any patient with acute abdominal pain with cardiovascular risks for thromboembolic phenomena and elevated LDH value.

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