



## Ruptured Renal Artery Pseudoaneurysm: Case Report

Carvalho MS, Gonçalves J, Ramos NA, Gaburri AK, Vilas Boas DS, da Costa W and Romiti M\*

Angiocorpore Institute of Cardiovascular Medicine, São Paulo, Brazil

### Abstract

**Introduction:** Renal artery pseudoaneurysm is a rare vascular complication, which can be caused by percutaneous surgery, renal biopsy, nephrectomy, penetrating trauma and, more rarely, blunt trauma.

**Clinical Case:** Female, 63 years old, complaining of pain in the right lumbar region that began a week ago and hematuria for 1 day, reports falling down stairs with blunt trauma to the right flank 3 months ago. She was in a regular general condition, pale, tachycardic, hypotensive, with painful abdomen on the right flank. Upon admission, he presented a hemoglobin of 8.0, urine I with hematuria, renal function within normal limits, a tomography of the abdomen and pelvis with intravenous contrast was requested, which showed: Two intralobar aneurysmal saccular formations next to the right renal pelvis, measuring 32 and 37 mm, with signs of rupture into the retroperitoneum in the posterior pararenal space of the flank, right iliac fossa. An arteriography was performed, which revealed a ruptured tamponade pseudoaneurysm, and a covered stent was implanted in the pseudoaneurysm of the right renal artery. The patient progressed post-operatively with improvement in pain complaints and gradual improvement in hematuria.

**Discussion:** Treatment can be surgical or conservative, endovascular treatment has been increasingly accepted as an alternative to conventional therapy, especially in complex and intraparenchymal cases.

**Conclusion:** Clinical history and physical examination are essential for the diagnosis of ruptured tamponade pseudoaneurysm, complementary exams are essential for diagnostic confirmation and surgical planning; surgical treatment with covered stent implantation is an effective, minimally invasive treatment with satisfactory results.

### Introduction

An aneurysm is an abnormal dilation of the lumen of a blood vessel secondary to disease or damage to the vessel wall. According to the degree of involvement of the vascular layer, it can be divided into two types: True aneurysm and pseudoaneurysm. A true aneurysm expands and preserves all three layers of the arterial wall - the intima, media and adventitia. Pseudoaneurysm or false aneurysm is caused by rupture of the arterial wall, with extravasation of blood that is contained by neighboring tissues.

Renal artery pseudoaneurysm is a rare vascular complication, which can be caused by percutaneous surgery, renal biopsy, nephrectomy, penetrating trauma and, more rarely, blunt trauma.

The clinical picture may vary for each patient, and hematuria is the most common symptom. Therefore, its diagnosis requires a high degree of clinical suspicion, which can be clarified by complementary tests, such as color Doppler ultrasound, computed tomography, arteriography, scintigraphy [1].

Some evidence suggests that these injuries may regress without intervention, although isolated observation is not recommended as a management strategy in the vast majority of patients due to the high risk of rupture [2].

Given the low expectation of spontaneous resolution and the risk of rupture, correction of these injuries is necessary. Endovascular treatment has been increasingly accepted as an alternative to conventional therapy [3].

### Case Presentation

A 63-year-old female patient was admitted to the emergency room of a private hospital

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**\*Correspondence:**

Marcello Romiti, Angiocorpore Institute of Cardiovascular Medicine, Santos, São Paulo, Brazil

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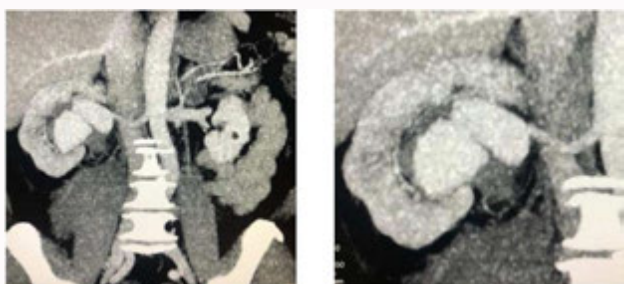
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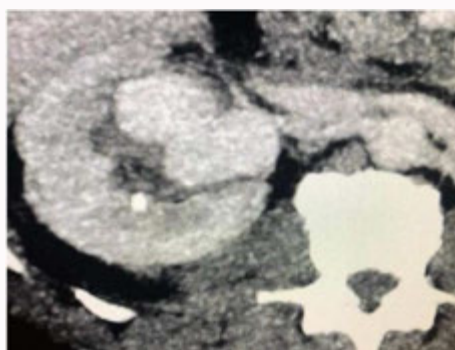
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**Figure 1:** Computed tomography of the abdomen and pelvis with endovenous contrast showing pseudoaneurysm of a ruptured right renal artery (Axial View).



**Figure 2 and 3:** Computed tomography of the abdomen and pelvis with contrast (Coronal View).



**Figure 4:** Computed tomography of the abdomen and pelvis with contrast (Axial View).

complaining of pain in the right lumbar region that began a week ago, progressing with worsening pain and the appearance of hematuria 1 day ago, reporting a drop in stairs with blunt trauma to the right flank 3 months ago.

On physical examination, she was in a regular general condition, pale, tachycardic (HR 104 bpm), hypotensive (BP 90 × 50 mmHg), eupneic (RR 20 ipm), painful abdomen on the right flank, positive Giordano on the right, negative sudden decompression. Upon admission, he presented a hemoglobin of 8.0, urine I with macroscopic hematuria, renal function within normal limits, a tomography of the abdomen and pelvis with intravenous contrast, was requested, which showed: Two intralobar aneurysmal saccular formations next to the right renal pelvis, measuring 32 and 37 mm, with signs of rupture into the retroperitoneum in the posterior pararenal space of the flank, right iliac fossa (Figures 1-5).

Patient progressing with worsening low back pain, maintained macroscopic hematuria, there was a drop in hemoglobin from 8.0 to



**Figure 5:** Computed tomography of the abdomen and pelvis with contrast (Sagittal View).



**Figure 6:** Arteriography of the right renal artery identifying the presence of 2 ruptured plugged pseudoaneurysms in the right renal artery.

6.5, transfusion of 2 packed red blood cells was performed and urgent surgical approach was indicated.

An arteriography of the right renal artery was performed, which revealed a ruptured tamponade pseudoaneurysm. A covered stent was then implanted in the pseudoaneurysm of the right renal artery, a procedure that was carried out successfully.

### Procedure Description

A puncture of the right common femoral artery was performed according to the Seldinger technique, passing a 5 Fr sheath; Passage of a 0.035 mm × 260 mm hydrophilic guide wire + 5 Fr snake catheter with catheterization of the right renal artery (Figure 6).

Exchange of 5 Fr introducer per 8.5 cm × 65 cm Speed cross sheath, exchange of hydrophilic guide wire for 0.035 mm × 260 mm Amplatz guide wire + 5 Fr Vert catheter (Figure 7).

Advanta V12 Stent Implantation 6 mm × 59 mm in the right renal A (Figure 8).

The final result was the correction of a right renal pseudoaneurysm, ruptured with a covered stent (Figure 9).

Control angiography with satisfactory results: The introducer was removed and manual compression was performed for 30 min, followed by a compressive dressing.

The patient improved post-operatively with pain complaints, maintaining normal renal function and gradual improvement in hematuria. She remains under asymptomatic outpatient follow-up, with no hematuria, and with renal function within normal limits, a Doppler ultrasound of the renal arteries was performed, which is within normal limits.



Figure 7: Overcoming right renal artery pseudoaneurysms with vert catheter.



Figure 8: Stent Implantation.



Figure 9: Covered Stent.

## Discussion

Pseudoaneurysm can be defined as a pulsatile hematoma that communicates with the artery through a passage in the arterial wall. As a result, a neck is formed that connects the artery to one or more cavities (whose walls are formed by the tissue surrounding the artery), allowing systolic flow towards the cavity and diastolic flow towards the artery, unlike a true aneurysm, whose walls are those of the vessel itself [4].

After complete or partial injury to an artery, the adjacent surrounding tissues - vessel adventitia, renal parenchyma, Gerota's fascia - can contain hemorrhage, and the combination of hypertension and coagulation promotes temporary containment of bleeding. Clot lysis and degradation around the necrotic tissue results in recanalization between the intravascular and extravascular and, subsequent, formation of the pseudoaneurysm [5].

The development of renal artery pseudoaneurysms is extremely rare and there are few data describing its formation after blunt abdominal trauma [6]. It is believed to result in rapid deceleration induced with complete or partial injury to the thickness of the wall of the arteries that supply the renal parenchyma [7].

These vascular lesions are often associated with kidney biopsy, nephrectomy, kidney transplantation, or percutaneous surgery. Furthermore, in relation to penetrating trauma and, more rarely, blunt trauma, a sudden deceleration mechanism in a car accident is the most likely cause [7].

The clinical manifestations of these lesions include macroscopic hematuria, low back pain, hypertension, and a palpable abdominal mass. Hematuria is the most common symptom. PAR is the result of erosion of the pseudoaneurysm into the adjacent renal collecting system [1].

Pseudoaneurysm treatment can be surgical or conservative, depending on the patient's clinical condition. Endovascular treatment has been increasingly accepted as an alternative to conventional therapy, especially in complex and intraparenchymal cases.

## Conclusion

Clinical history and physical examination are essential for the diagnosis of ruptured tamponade pseudoaneurysm, complementary exams are essential for diagnostic confirmation and surgical planning; Surgical treatment with covered stent implantation is an effective, minimally invasive treatment with satisfactory results.

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