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Stent Exclusion of a Mycotic Renal Artery Aneurysm by Use of a Covered Coronary Stent System: Clinical Case

Adriana Figueiredo*, Daniela Gonçalves, Gonçalo Rodrigues, Nelson Camacho, Maria Emília Ferreira

Serviço de Angiologia e Cirurgia Vascular, Hospital de Santa Marta – Centro Hospitalar Universitário Lisboa Central (CHULC), Lisboa, Portugal

ABSTRACT

Mycotic aneurisms are uncommon. The visceral arteries are the most unusual site and rupture is often associated with life-threatening hemorrhages. We present a case of a visceral mycotic aneurysm located in superior segmental artery, branch of the left renal artery in an immunosuppressed patient with positive blood cultures to Salmonella. The aneurysm was excluded with a covered stent which was designed for the treatment of acute coronary perforations.

Keywords: Mycotic Aneurism, Visceral Mycotic Aneurism, Renal Mycotic Aneurism

INTRODUCTION

Mycotic aneurysms are a rare entity with rapid progression which can be fatal without appropriate treatment, as the rupture of this aneurisms is often associated with life-threatening hemorrhages [1]. The visceral arteries are the least common sites for mycotic aneurysm formation, representing ≤1% of intra-abdominal mycotic aneurysms [2,3]. They are more often caused by bloodstream infection but they may develop as a result of septic emboli to the vasa vasorum or by directly spread from infected tissue adjacent to the vascular wall. The microbial infection is predominantly bacterial with Staphylococcus, Salmonella and Streptococcus species been considered the most frequent bacteria, but the spectrum of other organisms is widening [1-3].

Therapeutic options should be individualized according to the characteristics of the aneurysm and include open surgery, endovascular embolization, endovascular covered stent placement, medical therapy, or a combination of these [1,2]. However, prompt initiation of antibiotic treatment with broad spectrum antibiotics or targeted antibiotics against pre-operatively identified organisms is crucial for treatment success [3,4].

The purpose of this article is to report our result in endovascular treatment of a mycotic renal artery aneurysm with a covered coronary stent system typically used for the treatment of acute coronary perforations.

CLINIC CASE

58-year-old woman with known history of Poliomyositis under imunosupressive medications, diabetes and depression. She was admitted for five days of fever, malaise and lumbar pain radiating to

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***Corresponding Author**

Adriana Figueiredo

Serviço de Angiologia e Cirurgia Vascular, Hospital de Santa Marta – Centro Hospitalar Universitário Lisboa Central (CHULC), Rua de Santa Marta 50, Piso 3, Hospital de Santa Marta, 1169-024 Lisboa, Portugal, ORCID: 0000-0002-6602-5193, Email: amarizfigueiredo@gmail.com

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the left iliac fossa without any other complain or sign. On admission she was febrile (37.9 °C), presented localized back pain, abdominal tenderness and pain in the right iliac fossa, while heart and lungs examination were normal. No joint pain or skin findings were observed. Mental status and neurological exam were normal. Laboratory findings showed increased inflammatory parameters (Table 1).

Because of no improvement of the back pain despite escalating analgesic therapy and to screen for an infectious focus in an immunosuppressed patient, a computed tomography angiography (CTA) was performed at second day of hospitalization. The CTA showed an image compatible with a probable saccular mycotic aneurysm of the left renal artery with a growth from about 9 mm to 25 mm, compared to the last imaging performed 4 weeks earlier.

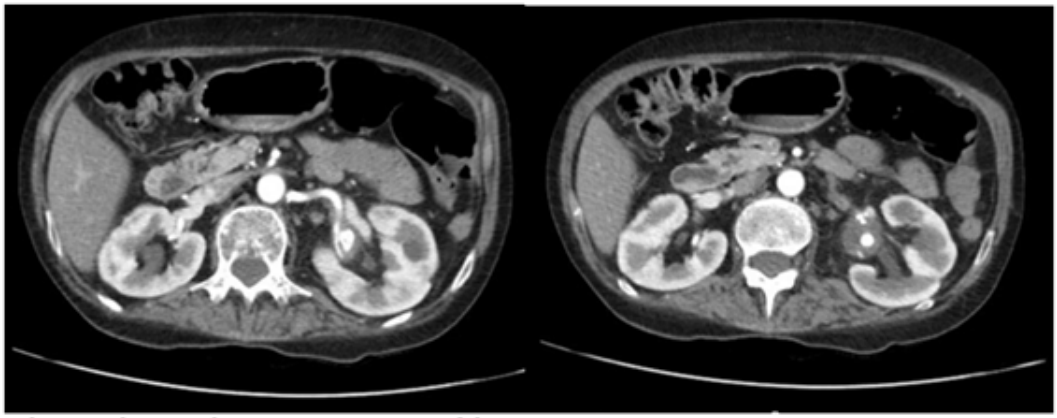

Figure 1. The CTA showing the mycotic aneurysm of the left renal artery.

Table 1. Patient's laboratory data

Hemoglobin	**14,9 x 10 g/L**
Leukocytes	13,04 x 10^9/L
Neutrophils (%)	9,38 x 10^9/L (85,1%)
Eosinophils	0,00 x 10^9/L (0,0%)
Basophils	0,004x 10^9/L (0,4%)
Lymphocytes	0,97 x 10^9/L (8,8%)
Monocytes	0,63 x 10^9/L (5,7%)
Platelets	210 x 10^9/L (0,0%)
D-dimers	2394,0 µg
Creatinine	0,73 mg/dL
Estimated glomerular filtration rate	91 mL/min./1,73
C-reactive protein	367,0 mg/L

The microbiological screen done at admission show positive blood cultures for *Salmonella enteritis* sensitive to ampicillin\amoxicillin, TMP-SMX and Ciprofloxacin, positive urine cultures sensitive to Ampicillin\amoxicillin, TMP-SMX, Gentamicin and negative transthoracic echocardiogram for vegetations on the heart valves. Targeted antibiotic therapy with amoxicillin IV was initiated.

Due to the high risk of rupture in a fragile patient, she was admitted for urgent endovascular exclusion of the mycotic aneurysm that revealed to be originating from the superior segmental artery of the left kidney. Under local anesthesia and through a right eco-guided femoral access with 6F introducer, we catheterize the left renal artery after abdominal aortic angiography using a Cobra guide catheter. Selective renal angiography confirmed a saccular aneurysm located in left upper pole (image 3 and 4). A 0.01400 guidewire was advanced and positioned distal to the aneurysm sac. The Cobra was removed and changed by 3,5x20mm monorail balloon-expandable and covered stent (PR Papyrus®) that is typically used by cardiologists for the treatment of acute coronary perforations. The final angiogram showed complete exclusion and preservation of the branch without perioperative complications. To close de access site an AngioSeal® was used with success.

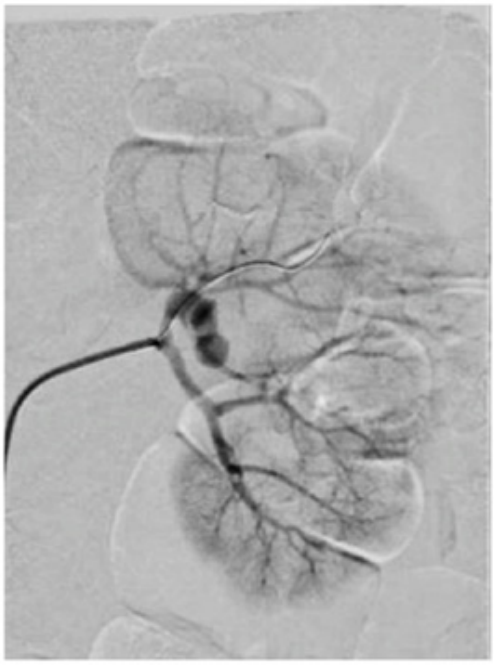

Figure 2. Initial angiography which shows a saccular mycotic aneurysm in the left upper pole.

Figure 3. Final angiography with complete exclusion and preservation of the branch.

The patient made an uneventful recovery and was discharged with indication to do at least six weeks of targeted antibiotic therapy. At a follow-up visit 1 month postoperatively, the patient's creatinine was at baseline and the follow-up CTA a patent left renal artery after repair. The patient was also referred to the Infectious Diseases consultation with negative blood cultures after completing the course of antibiotic therapy with amoxicillin.

DISCUSSION

In general, mycotic aneurysms have a dramatic course without prompt diagnosis and treatment. Early diagnosis and adequate treatment are essential for the improvement of survival. Diagnosis of a mycotic aneurysm is based on a combination of clinical presentation, laboratory tests and microbiology, and imaging parameters as there is no pathognomonic symptom or test for the disease [1,5]. A concomitant infection and/or immunosuppressive disease are often seen. The initial management should include empiric bactericidal antibiotics and all patients require prolonged antibiotic therapy tailored to the culture and sensitivity results [1,4]. Due to the rarity of this entity there's still lacking strong conclusions about the best treatment modality. The therapeutic should be individualized taking into account the patient and the characteristics of the aneurysm such as location, size, morphology and the existence of rupture [2,3]. The prolonged antibiotic therapy course aids the limitation of the perivascular tissue infection or its further spread. There is no consensus on overall duration of antibiotics, but a 6-8 weeks period of medical therapy is recommended which is associated with better outcome and minimal relapse. The duration should be prolonged if there is evidence of persistent infection [1,2,4].

Given the high mortality with medical therapy alone, traditional surgical repair mandates resection and wide debridement of the infected tissue with or without vascular reconstruction [3,4]. There is a growing trend towards endovascular treatment which may be accepted as an alternative for high-risk patients with well-controlled infections or as a bridging procedure before definitive repair in patients who are in severe sepsis [1]. The major limiting factor of the endovascular option is the insertion of a foreign body in an infected tissue which could result in further colonization and infection relapse [4]. However, for hemodynamic stable patients (nonruptured cases) intervention when blood cultures are negative could therefore be a desirable goal and may be offered delayed surgical repair to accrue maximum benefit of antibiotic treatment first [3,4].

In the presented case, the patient had been under targeted antibiotics for just 2 days. After multidisciplinary discussion and based on the fragility of the patient, the rapid growth rate with a high risk of rupture and the surgical inaccessible site, the patient was admitted for urgent endovascular treatment. As there was an adequate distal and proximal landing zone, we decided to use a covered stent to exclude the aneurysm and preserve the artery. But given the small diameter of the artery, a Papyrus mono-rail balloon-expandable covered stent was used. This stent is typically used by Cardiology in the treatment of coronary perforations given its low profile and delivery system which provides rapid introduction of the stent.

CONCLUSION

The capability of technical adaptation to achieve a better solution with no risk increase is a constant in the clinical practice of the Vascular Surgeon. This case favors the off-the-shelf use of covered coronary stent system when we desire a fast solution for small artery injuries as the monorail balloon-expandable stent delivery system and its low profile provides rapid introduction of the device over the guidewire and facilitates the use of small sheaths to minimize access-site complications.

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CONFLICTS OF INTEREST

None.

CONSENT FROM PATIENT

Written consent was taken from the patient to publish this report.

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