



## Mycotic Aneurysm of Native Renal Artery: Case Report and Review of the Literature

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### Abstract

**Introduction:** Renal native artery is an uncommon localisation of mycotic aneurysm that involves most frequently the artery of renal transplant in immuno-suppressed patients. Septic embolization often occurs during endocarditis and direct infection could complicate endovascular procedures with device placing.

**Case report:** We herein describe the case of a leaking mycotic aneurysm of the native renal artery (MANRA) in a renal transplanted patient, successfully treated by open aneurysmectomy and prolonged antibiotic therapy. Proximal localisation and history of scleroderma has never been described previously.

**Discussion:** Conventional treatment of MANRA includes prolonged antibiotic therapy usually associated with endovascular or surgical repair. The 13 cases present in literature are analysed specially regarding the treatment indications based on localisation of the lesions.

**Conclusion:** The presented case supports the attitude of an early and aggressive treatment of MANRA, in order to prevent rupture and avoid nephrectomy. Surgical or endovascular approach could be indicated according respectively to the proximal and distal localisation.

### Keywords

Mycotic aneurysm, Infected aneurysm, Renal aneurysm, Leaking aneurysm, Native renal artery, Kidney transplantation, Scleroderma, Nephrectomy, Endovascular, Endovascular embolization

### Introduction

Mycotic aneurysm is defined as a localised and irreversible destruction of arterial wall by bacterial infection. It results in a segmental dilatation of native vessel to at least one and a half times its normal diameter [1]. Renal artery localisation is uncommon. Physiopathology recognises permeation of septic emboli to the vasa vasorum, often during endocarditis or others causes of septicaemia [2]; infection of endovascular devices, such as renal stent, has also been described [3-6].

Lesions are often asymptomatic until rupture and, usually, clinical manifestations may include massive hematuria as observed

in half of the reported cases [2-3,7-12]; it may also include flank pain [13], fever and sepsis [4,14].

Streptococcus, Staphylococcus and Pseudomonas are most common pathologic agents [2-4,6,11,15-17].

Conventional treatment includes prolonged antibio-therapy, possibly associated with endovascular or open surgical repair.

The following report describes a case of a leaking mycotic aneurysm: native renal artery localisation in presence of a renal heterotopic transplant has never been observed, neither has the association with a medical history of scleroderma.

### Case Report

A 64-year-old man, presenting a history of diffuse type scleroderma with chronic renal failure, under immunosuppressive therapy for heterotopic renal transplantation, was admitted to the emergency room for a persistent lumbar pain and fever. Other relevant antecedents in the patient's medical history are: high blood-pressure, hypothyroidism, atrial fibrillation. The patient's immunosuppressive therapy consisted in Tacrolimus 1.5mg 1x/d and Mycophenolic acid 250mg 2x/d.

At the time of admission, vital signs and physical examination were normal except for pain on palpation of the left flank.

Blood tests revealed hyperleukocytosis (13.700) and C-reactive protein elevation (187 mg/l); serum creatinine was compatible with chronic renal allograft rejection (3.2mg/dL).

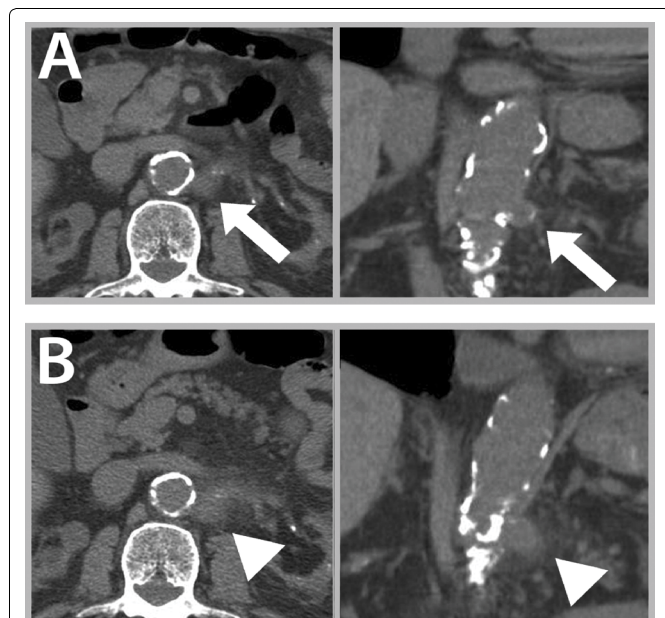
An abdominal-pelvic-CT scan without contrast injection was performed in order to preserve the renal function. It revealed a 2 cm aneurysm of the proximal left native renal artery without sign of rupture (Figure 1A). Wide spectrum antibiotics were introduced on the basis of clinical and radiological suspicion of infected vascular lesion (Cefuroxime 1,5 g 3/day and metronidazole 500 mg 3/day). Three days later, a new CT scan was performed to assess the worsening of symptoms. The second CT scan showed an increase in size and early signs of leakage (Figure 1B).

A surgical intervention was formally indicated. Laparotomy confirmed the radiological findings (Figure 2).

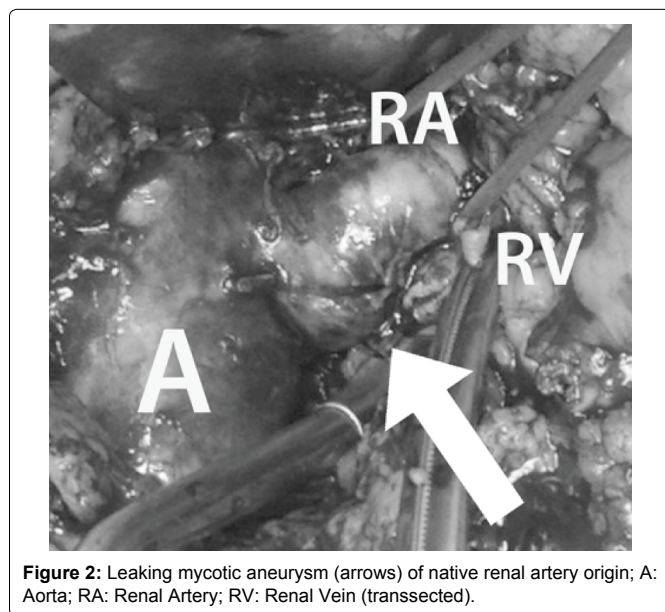
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**Figure 1:** (A) Uncomplicated mycotic aneurysm (arrows) of native renal artery origin, renal bilateral atrophy. (B) Leaking mycotic aneurysm of native renal artery origin (triangles).



**Figure 2:** Leaking mycotic aneurysm (arrows) of native renal artery origin; A: Aorta; RA: Renal Artery; RV: Renal Vein (transsected).

Following abdominal aorta clamping, above the renal arteries, aneurysmectomy with proximal aortic tangential resection and distal arterial ligation was performed. Arterial revascularisation wasn't necessary because of the renal atrophy. Primary closure of the aortic renal ostium was carried out by separate stitches.

Histological and bacterial examination confirmed the clinical suspicion of infected aneurysm with gram positive cocci germs; the culture of arterial biopsy revealed the growth of *Streptococcus Agalactiae*, sensitive to Cefuroxime. During the hospital stay, the multiple sets of blood cultures were negative.

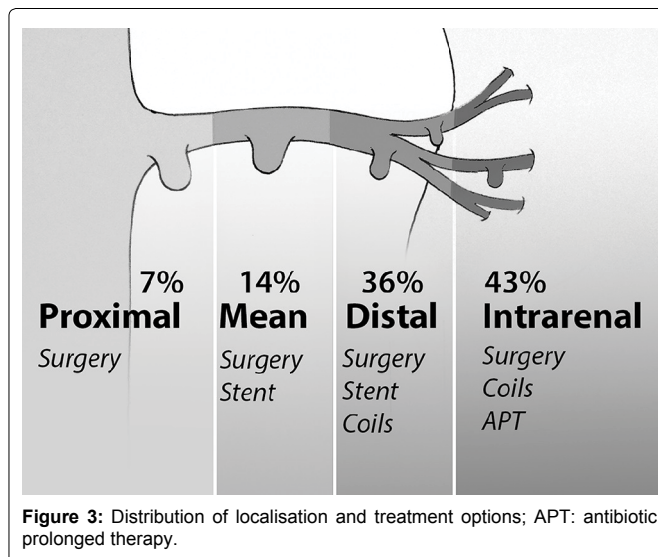
Transthoracic echocardiography revealed no vegetation.

The post-operative course was uneventful; Cefuroxime was administered until the 20<sup>th</sup> post-operative day and the patient was discharged at post-operative day 25.

No recurrence was found 21 months after surgery.

## Discussion

Natural history of mycotic aneurysm of native renal artery (MANRA) is still unclear. The cases in literature often report infected aneurysm of the grafted renal artery in transplanted patients, in



**Figure 3:** Distribution of localisation and treatment options; APT: antibiotic prolonged therapy.

which a clear role of steroids and immunosuppressive treatments is documented [7].

One interesting finding, in the reported case, is that the mycotic aneurysm occurred in the proximal native renal artery instead of transplant renal artery, as is its common occurrence. Furthermore, to our knowledge, the present case is the first report of proximal localisation. Figure 3 shows the distribution of localisation and the treatment based on our review of literature.

According to the literature, MANRA increases in size quickly and early leakage is frequent, as occurred in the presented case [2]. Acute evolution of MANRA seems to be more frequent and earlier than in atherosclerotic renal artery aneurysm in which, apart from occurrence during pregnancy, rupture is a rare event. The incidence of acute evolution of MANRA is under 5%, but the mortality can rise up to 80% [7-9].

Reported therapeutic options include targeted antibiotic therapy, often followed by endovascular or open surgical repair.

Literature doesn't support any evidence-based treatment: a complete review of the case report since 1977 is shown in table 1.

The few cases of MANRA describes often occurred in patients affected by important co-morbidity such as lupus erythematosus, rheumatoid arthritis, diabetes and cardiac risk factors for endocarditis, that is present in the half of the patients[2,3,11-15].

Scleroderma has never been reported in association with MANRA. We cannot state that scleroderma is a risk factor for MANRA considering that the presented case reports the history of a patient under immunosuppressive treatment after renal transplantation.

Analysing the 13 cases reported in literature, localisation of the lesions seems to be decisive factor in the choice of treatment.

Emergency nephrectomy was necessary in 30% of cases reported in literature: in case of involvement of the mean trunk of renal artery or in presence of massive renal infarction [4,14,16,17]. Coils embolization was successful and uncomplicated in 80% of cases [2,3,13,15,16].

An early elective surgical or endovascular treatment may be recommended and the conservative medical management has to be reserved only for the very small intra-renal lesions [10-12].

Endovascular coils embolization, stenting exclusion or booth, appears to be preferred for the management of distal or intra-renal localisations, with a morbidity of 20% [16].

At present, proximal localisation of the MANRA and failure of endovascular procedure still requires open surgery; in the second case, nephrectomy is often mandatory.

**Table 1:** Complete review of the literature since 1977.

Author	sex	age	comorbidities	Clinical circumstances	Clinical presentation	Etiology	Localisation	cm	endocarditis	rupture	treatment	Local evolution
<b>Arru-Arendt 2015</b>	M	64	Scleroderma, renal transplantation	Persistent aspecific fever	Flank pain	<i>Streptococcus agalactiae</i>	Proximal	2	no	yes	Aneurysmectomy	Uneventful
<b>Uno 2012 [2]</b>	W	50	Ductus Arteriosus	Dental procedure	Massive hematuria	<i>Streptococcus oralis</i>	Intrarenal	-	Yes	yes	Coil embolization	Uneventful
<b>Rabellino 2011 [13]</b>	W	54	Foramen ovale	Pneumonia	Flank pain	-	Distal branch	2	Yes	no	Stenting and coils embolization	Uneventful
<b>Stout 2011[6]</b>	W	56	Renal artery stenting for hypertension	Stent infection	Asymptomatic	<i>Methicillin-resistant Staphylococcus</i>	Distal branch	2.8	No	no	Stent removal, Aneurysmectomy and heterotopic revascularisation	Uneventful
<b>Chiu 2008 [14]</b>	W	54	Lupus erythematosus	Peritonitis, pneumonia, arthritis, osteomyelitis	shock	<i>Salmonella sero-group B</i>	Mean trunk	4	no	yes	Emergency nephrectomy	Uneventful
<b>Sliker 2005 [15]</b>	W	58	Diabete	Pyelonephritis	Hematuria, flank pain	<i>Escherichia Coli</i>	Distal branch	-	no	no	Endovascular occlusion	Uneventful
<b>Ohebshalom 2001 [16]</b>	W	40	none	Dental procedure	Hematuria	<i>Streptococcus viridans</i>	Intrarenal	4.4	Yes	yes	Coils embolization	Emergency nephrectomy for renal infarction
<b>De Maioribus 1998 [4]</b>	M		Renal artery stenting for hypertension	Stent infection	shock	<i>Staphylococcus Aureus</i>	Mean trunk	-	no	no	Nefrectomy and device ablation	Uneventful
<b>Hall 1987 [3]</b>	W	68	Rheumatoid arthritis	Pyelonephritis	Massive hematuria in course of antibiotic treatment, flank pain	<i>Pseudomonas Aeruginosa</i>	Distal branch	-	no	yes	Endovascular coils embolization	Uneventful
<b>DuBrow 1981 [11]</b>	W	42	Mitral insufficiency after rheumatic fever	Acute leucokemia	Asymptomatic	-	Intrarenal	0.5	yes	no	Prolonged antibiotic treatment	Uneventful
<b>DuBrow 1981 [11]</b>	M	58	Cardiac murmur	Aspecific fever	Asymptomatic	<i>Streptococcus</i>	Intrarenal	0.8	yes	no	Prolonged antibiotic treatment	Uneventful
<b>DuBrow 1981 [11]</b>	M	7	Valvotomy for congenital aortic stenosis	Limb ischemia (septic emboli)	Asymptomatic	<i>Aspergillus</i>	Dubble localisation: intrarenal and aortic	0.5	yes	no	Surgical repair of mycotic aortic aneurysm and prolonged antibiotic treatment	Uneventful
<b>Rabinowitz 1979 [17]</b>	M	15	none	Septicaemia (unknown origin)	Massive hematuria	<i>Staphylococcus pyogenes</i>	Distal branch		yes	yes	Emergency nephrectomy	Uneventful
<b>Ganem 1977 [10]</b>	M	77	none	Vascular catheterisation	Hematuria	<i>Escherichia Coli</i>	Intrarenal	-	no	yes	Prolonged antibiotic treatment	Uneventful

## Conclusions

The current literature supports the attitude of an early and aggressive treatment in order to prevent rupture and to avoid nephrectomy. Surgical or endovascular approaches may be indicated depending on the proximal and distal localisation, respectively.

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