

## Case Report

### Surgical Management of a Complex Renal Artery Aneurysm

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#### Abstract

Renal artery aneurysms are uncommon. They are a rare cause of abdominal pain. We report of a successful case of surgical aneurysmorrhaphy, in a 56-year-old patient with a right renal artery aneurysm complaining from abdominal pain since 3 months. The postoperative course was favourable.

**Keywords:** Abdominal pain; Aneurysmorrhaphy; Renal artery aneurysm

#### Introduction

Renal artery aneurysms are rare vascular lesions with an incidence rate of approximately 0.1% [1]. They are usually an incidental discovery following investigation of potential renal causes of hypertension [2]. They often present a complex problem for both endovascular and open surgical repair [3]. We report a case of symptomatic distal renal artery aneurysm managed surgically with aneurysmorrhaphy.

#### Case Presentation

A 56-year-old man without past medical history, presented with abdominal pain since 3 months. Physical examination revealed that the blood pressure was 113/80 mm Hg. No biological anomalies were detected. The creatinine level was normal. Computed tomography imaging revealed a fusiform right renal artery aneurysm measuring 3 cm in diameter in the distal left renal artery at the bifurcation level (Figures 1 and 2).

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**Figure 1:** Three-dimensional reconstruction of CT scan showing fusiform aneurysm of the distal right renal artery.



**Figure 2:** Axial CT scan image showing the aneurysm in the distal right renal artery at bifurcation.

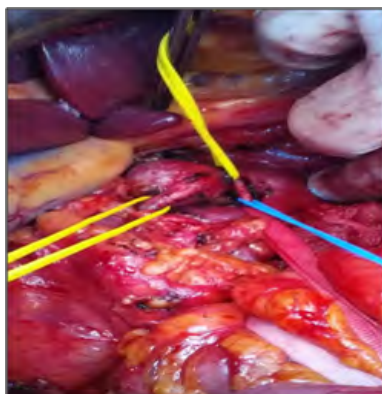
Endovascular intervention such as coil embolization or stent graft placement was not feasible because of the complex anatomy and the location of the aneurysm at the renal artery bifurcation. Also, endovascular techniques are not developed in our center.

So, he underwent surgical management under general anesthesia and right lombotomy. After access to the retroperitoneal space, we dissected the abdominal aorta, the renal artery aneurysm and the arterial branches emerging of the aneurysmal sac.

Macroscopic intra-operative examination a non-ruptured true aneurysm of the distal right renal artery without extension to the aorta and to the arterial branches. Then, heparin was administered to the patient, and the aorta and the branches of the aneurysm were clamped.

The aneurysm was opened longitudinally. There was no thrombus in the arterial wall. An aneurysmorrhaphy was done. Then, the

reconstruction of the renal artery was performed by a suture (Figures 3 and 4). The postoperative course was uneventful. The pathological examination revealed marked atherosclerosis change with vessel wall destruction; no evidence of fibromuscular dysplasia change was found.



**Figure 3:** Perioperative findings: Dissection, exposure and resection of the renal artery aneurysm and its branches.



**Figure 4:** Peri-operative view showing the renal artery after resection of the aneurysm (arrow).

## Discussion

Isolated renal artery aneurysms are rare. Their natural history is that of slow to growth. A minority of patients present with symptoms, and clinical examination may reveal blood hypertension [1]. They are increasingly detected with increased use of computed tomography and angiography [4]. Potential complications include rupture, distal embolization, infarction, hypertension, dissection, renal failure, and arteriovenous fistula [5].

Renal artery aneurysms requiring intervention include a lesion size of >2cm, because the increased risk of rupture and the poor outcomes described with conservative management [6]. Management options include conservative treatment, endovascular intervention with embolisation or stent graft exclusion, or surgical reconstruction.

Most of these aneurysms involve one or multiple branches, such as the case of our patient [7]. So, endovascular options are often limited and open repair remains the mainstay for these complex cases. Also, we opted for surgical repair because of endovascular procedures are not developed in our center. The gold standard surgical technique

is aneurysmorrhaphy including aneurysm resection with primary angioplastic closure with or without branch reimplantation, patch angioplasty, primary re-anastomosis, interposition bypass, aorto-renal bypass, splanchno-renal bypass, and plication of small aneurysms [1].

Laparoscopic nephrectomy and autotransplant method is an alternative described in cases of proximal renal aneurysms not amenable to endoluminal stenting or coiling [3,8]. There have also been an increasing number of reports of both *ex vivo* and *in situ* laparoscopic repair of renal artery aneurysms [9]. Surgical techniques provide extremely durable outcome, with excellent long-term patency, freedom from recurrence or rupture, and survival [4]. Pfeiffer et al., [10] reported 82% patency of renal reconstructions during a mean follow-up of 46 months.

## Conclusion

Isolated renal artery aneurysms are rare, and may have serious complications such as rupture. Minimally invasive options, including endovascular therapy, for repair of RAAs are available and likely to continue to increase in use, but they are not feasible to the complex anatomical types of aneurysms, such as the case of our patient. Open reconstructions remain a safe and durable therapy, while options for endovascular repair offer benefits to select patients.

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