

# Renal Artery Aneurysm Coexisting with Accessory Renal Artery

M. Hasan Kalantar Motamedi MD,\* Ali Hemmat MD,†  
and Pooya Kalani MD. ††

## Abstract

True aneurysms of the renal arteries are a very rare entity. Herein we describe a case of saccular left renal artery aneurysm found as an incidental angiographic finding in an adult, hypertensive female. She also had an accessory renal artery supplying the lower third of the left kidney. She underwent surgery, during which the large renal artery aneurysm was resected and the renal blood flow restored with aortorenal bypass graft with autologous saphenous vein. Postoperative recovery was uneventful, and her blood pressure is presently well-controlled (*Iranian Heart Journal 2008; 9 (3):69 -72*).

**Key words:** renal artery aneurysm ■ accessory renal artery ■ hypertension ■ aortorenal bypass

**R**enal artery aneurysm is an uncommon clinical entity, but when encountered is of great clinical significance because of the tendency for rupture, and the risk of requiring nephrectomy is also high. In this report, we present a hypertensive patient with a large renal artery aneurysm and renal artery stenosis managed successfully at our center with aneurysmectomy and aortorenal saphenous vein bypass graft.

## Case report

A 54-year-old Iraqi female known to have hypertension was referred to our center with complaints of vague off and on pain in the left flank and dyspnea on exertion (NYHA class II). These symptoms had been present for about one year.

On physical examination, her blood pressure was 140/90 mmHg and she was taking amlodipine 5mg bd and atenolol 50mg bd.

Clinical examination did not reveal any abnormality on chest, cardiovascular, and abdominal examination. Laboratory tests of renal function and blood tests revealed no abnormalities except for elevated serum triglyceride (360mg/dl) and total cholesterol (275mg/dl) levels.

Echocardiography revealed concentric left ventricular hypertrophy without any regional wall motion abnormality or left ventricular dysfunction. Heart valve function was normal as well.

Angiography showed minimal coronary artery disease with intimal irregularities but no significant vessel stenosis. Selective catheterization of the renal arteries revealed a saccular aneurysm measuring about 4 x 3 cm in the left renal artery with evidence of renal artery stenosis proximal to the aneurysm (Fig. 1, A). Also, it showed an accessory renal artery originating separately from the aorta (Fig. 1, B).

Received Jul. 23, 2007; Accepted for publication May 2, 2008.

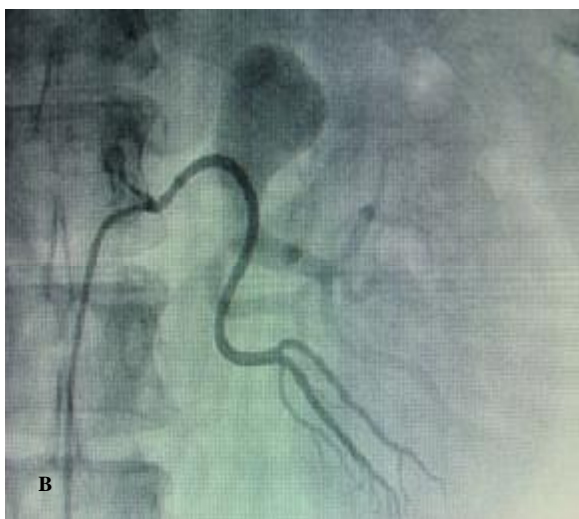
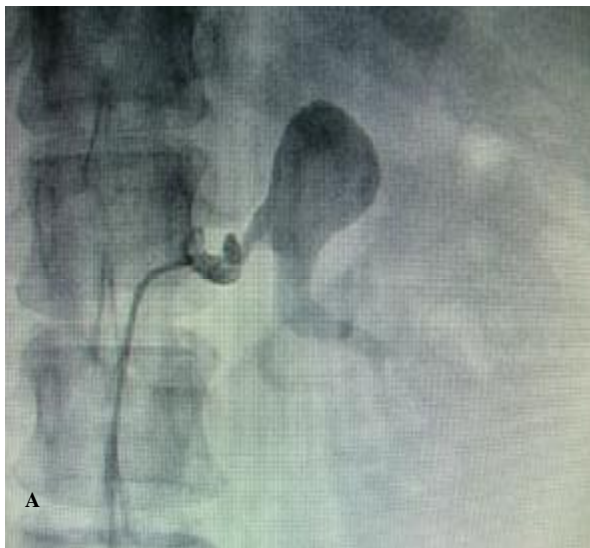
From the \*Department of Cardiovascular Surgery, † Department of Anesthesiology, and the ‡Cardiovascular Research Center, Jamaran Heart Hospital, Baqiatallah University of Medical Sciences, Tehran, Iran

Corresponding author: Mohammad Hasan Kalantar Motamedi, M.D., Assistant Professor of Cardiovascular Surgery, Jamaran Heart Hospital, Baqiatallah University of Medical Sciences, Tehran, Iran

Tel: +9821 - 22090204

Fax: +9821 - 22292243

Email: k\_motamedi @ hotmail.com



**Fig. 1.** Angiogram showing A) a saccular left renal artery aneurysm with proximal renal artery stenosis, and B) an accessory renal artery originating from the aorta and supplying the lower pole of the kidney.

Surgery was performed with a midline laparotomy incision; and after the displacement of the bowel and exposure of the abdominal aorta and the left renal vein, the large aneurysm measuring 4 x 3 x 2.5 cm was visualized arising from the mid-segment of the left renal artery (Fig. 2, A).



**Fig. 2. A,** operative view showing the renal artery aneurysm (arrow) just above the left renal vein



**Fig. 2. B,** macroscopic view of the resected specimen

After harvesting a suitable segment of the autologous saphenous vein from the patient's thigh, the distal anastomosis was done with a side-biting clamp (to allow perfusion of the kidney and reduce ischemic time) with 7-0 continuous prolene sutures. A soft bulldog clamp was thereafter placed on the proximal renal artery, and the aneurysm was resected (Fig. 2, B).

The proximal head of the saphenous vein graft was then anastomosed to the abdominal aorta using a side-biting vascular clamp. Total renal ischemic time was 13 minutes. The accessory renal artery was left undisturbed. Hemostasis was achieved, and the abdomen was closed in layers. The patient had an uneventful postoperative recovery with normal renal function tests, and she is doing well at a follow-up of three months.

### Discussion

The vast majority of patients with renal artery aneurysms are asymptomatic and are discovered incidentally during imaging studies. Renal artery aneurysm was documented in 0.73% to 0.97% of arteriograms performed.<sup>1, 2</sup> In our case, the aneurysm was an incidental angiographic finding.

Renal artery aneurysms have been classified into (i) saccular, (ii) fusiform, (iii) dissecting, (iv) false, and (v) intrarenal aneurysms.<sup>3</sup> Our patient had a saccular aneurysm, which occurs commonly in extrarenal vessels and has a peak incidence in the 40-60 year age group. Weakness in the arterial wall with atherosclerosis causes ballooning and thrombus formation.

The most catastrophic complication of renal artery aneurysm is rupture. Probably, fewer than 3% of renal artery aneurysms rupture.<sup>4, 5</sup> This complication is associated with a mortality rate of approximately 10% in males and non-pregnant females.<sup>6</sup> Any aneurysm more than 2cm in diameter has a higher risk of rupture; and in aneurysms more than 4cm in diameter, the risk of rupture is extremely high.

Hypertension occurs in 75% of patients with renal artery aneurysm and is usually long-standing<sup>7</sup> (about 14 years in our case). Renal artery aneurysms may cause renovascular hypertension by a) distal embolization with segmental hypoperfusion and renin-mediated vasoconstriction, b) fluid retention, or c) compression of an adjacent renal artery

branch or luminal stenosis due to extensive thrombus leading to renin-mediated hypertension. In our case, the hypertension was remarkably controlled after aneurysmectomy and aortorenal bypass graft with autologous saphenous vein.

Most authorities agree that indications for treatment include patient symptoms attributable to the aneurysm, renovascular hypertension, and size  $\geq 1.5$  cm - 2.5 cm<sup>8,9,10</sup> The midline laparotomy incision is preferred as it provides better exposure of the renal artery and the abdominal aorta. Aneurysmectomy with the preservation of the kidney is the major aim and is achieved by various reconstructive procedures which include (i) closed aneurysmorrhaphy, (ii) primary arterioplasty, (iii) reimplantation of the renal artery, and (iv) aortorenal bypass.<sup>11</sup> Endovascular procedures have been proposed recently for the treatment of renal artery aneurysms, but this approach was not tried in our case as it is suitable only for small aneurysms with a narrow base and any aneurysm as large as this one would be associated with a very high risk of rupture.

### Conclusion

Renovascular hypertension and large size of renal artery aneurysms are strong indications for elective renal artery aneurysmectomy. Aortorenal bypass using saphenous vein conduit is a safe and effective procedure for the repair of saccular renal artery aneurysms.

### References

1. Erdsman G. Angiography and suprarenal angiography. *Acta Radiol* 1957; 155 (Suppl): 104.
2. Tham G, Ekelund L, Herrlin K, Lindstedt EL, Olin T, Bergentz SE. Renal artery aneurysms: natural history and prognosis. *Ann Surg* 1983; 197: 348-52.
3. Poutasse EF. Renal artery aneurysm. *J Urol* 1975; 113: 443-49.

4. Stanley JC. Natural history of renal artery stenosis and aneurysm. In: Calligaro KD, Dougherty MJ, Dean RH (eds). *Modern Management of Renovascular Hypertension and Renal Salvage*. Baltimore, William and Wilkins, 1996.
5. Stanley JC, Rhodes EL, Gewertz BL, CY, Walter JF, Fry WJ. Renal artery aneurysms: significance of macroaneurysms exclusive of dissections and fibrodysplastic mural dilatations. *Arch Surg* 1975; 110: 1327-33.
6. Hageman JH, Smith RF, Szilagyi E, Elliott JP. Aneurysms of the renal artery: problems of prognosis and surgical management. *Surgery* 1978; 84: 563-72.
7. Henke PK, Cardneau JD, Welling TH, Upchurch GR, Wakefield TW, Jacobs LA, Proctor SB, Greenfield LJ, and Stanley JC. Renal artery aneurysms. *Ann Surg* 2001; 234 (4): 454-63.
8. Lumsden AB, Salam TA, Walton KG. Renal artery aneurysm: a report of 28 cases. *Cardiovascular Surg* 1996; 4: 185-9.
9. Dzsiniich C, Gloviczki , McKusick MA. Surgical management of renal artery aneurysm. *Cardiovascular Surg* 1993; 1: 243-7.
10. Dean RH. Renal artery aneurysm. In: Yoa JST, Pearce WH, eds: *Aneurysm: New Findings and Treatment*. Norwalk, Appleton and Lange, 1994; pp. 439-449.
11. Stanley JC. Treatment of renal, splenic and hepatic artery aneurysms. In: Nyhus LM, Baker RJ (eds). *Mastery of Surgery* 1992; 173: 17.

