Thirty-nine-year-old woman with a right renal artery aneurysm: Technique for open repair

Taleen A. MacArthur, MD, Armin Farazdaghi, MD, Manju Kalra, MBBS, *and* Bernardo C. Mendes, MD, *Rochester, MN*

Renal artery aneurysms (RAAs) are rare with an incidence of 0.1% in the general population.[1] In patients without the ability to become pregnant, these should be repaired at a size ≥3.0 cm due to a mortality risk of approximately 10% associated with rupture in these populations.[2] In women with the ability to become pregnant, these should be repaired at any size due to high rupture risk associated with the hormonal milieu of pregnancy.[2,3] RAA rupture in pregnant patients has been associated with a high maternal and fetal mortality risk.[1,3] Although endovascular treatment of these aneurysms has become common, direct open surgical repair remains an important approach, particularly for lesions close to the renal hilum that may have multiple segmental branches to best preserve renal perfusion.[4] Written informed consent was provided by the patient for publication of this case.

CASE DESCRIPTION

This case describes a 39-year-old woman who was incidentally diagnosed with a 2.0-cm right RAA. This was discovered on a computed tomography angiogram (CTA) obtained at the time of a spontaneous coronary artery dissection, from which she recovered without any cardiac sequelae. There were no other signs or symptoms suggestive of a connective tissue disorder, and she had not undergone genetic testing, though we were suspicious for a diagnosis of fibromuscular dysplasia based on her clinical history. She was premenopausal and otherwise healthy without any vascular surgical history and is a mother to five biological children. The patient had no symptoms, and renal function was normal. Although the patient did not plan to have more children, given that she has the ability to become pregnant, we planned for operative intervention without further surveillance imaging.

The aneurysm was located at the renal hilum with three branches of equal diameter originating from the aneurysm. Given the multiple branches from the aneurysm and proximity to the renal hilum, we proceeded with open repair aiming for aneurysm resection and primary repair. We were, however, prepared to harvest the great saphenous vein if it was determined intraoperatively that this would be necessary for a bypass in the case that a primary repair was not feasible. Under general anesthesia, a right subcostal incision was made, the ascending colon and duodenum were retracted through a medial visceral rotation, and the right renal hilum was exposed. The right renal vein was dissected free. Dissection was carried along the right main renal artery toward the hilum where the aneurysm was identified along with three segmental branches. This dissection was tedious due to inflammation in the area, the proximity of the aneurysm to the kidney parenchyma, and numerous adherent crossing veins. The main right renal artery and each segmental branch were fully skeletonized and controlled with silastic vessel loops. The patient was then fully heparinized. The main right renal artery was controlled using a Kirchner clamp, and each segmental renal artery was controlled with a Sugita clamp. The aneurysm was opened along its length, a portion of the anterior aneurysm wall was resected, and a common wall was maintained between the three branches. On opening the aneurysm, it was clear that all three branches were feeding off the aneurysm, with one branch being very posterior. Primary arterial reconstruction was performed using a running 5-0 Prolene suture, with all branches incorporated into the suture line for optimal renal perfusion. Appropriate fore and back bleeding were allowed, and the anastomosis was found to be hemostatic. The patient was transferred to the vascular surgery floor postoperatively and was discharged home on postoperative day 2 with normal renal function. She is maintained on a daily baby aspirin for antiplatelet and repair maintenance. Final pathology from the aneurysm demonstrated end-stage vascular remodeling and could not definitely assess for fibromuscular dysplasia, though we are still suspicious for this based on her clinical history. Postoperative 3-month follow-up CTA demonstrated patent reconstruction, and she continues to have normal renal function postoperatively. Moving forward, we will obtain an annual CTA of the abdomen and pelvis for surveillance.

CONCLUSIONS

RAAs are a rare pathology that are often asymptomatic and incidentally discovered. However, timely repair is

From the Division of Vascular and Endovascular Surgery, Mayo Clinic.

A Supplementary Video is available at the end of this paper.

Presented at the VAM 2024 Annual Meeting in the "How I do it" Video Session on June 20, 2024, Chicago, Ill.

Additional material for this article may be found online at www.jvscit.org.

Correspondence: Bernardo C. Mendes, MD, Division of Vascular and Endovascular Surgery, Gonda Vascular Center, 200 1st St SW, Rochester, MN 55905 (e-mail: Mendes.Bernardo@mayo.edu).

The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

J Vasc Surg Cases Innov Tech 2024;10:101555

2468-4287

https://doi.org/10.1016/j.jvscit.2024.101555

necessary, particularly in women with the ability to become pregnant, who face significant potential morbidity and mortality with rupture. In cases of complex RAAs such as this, open repair with preservation of all segmental branches can optimize renal perfusion.

DISCLOSURES

B.C.M. receives consulting fees from WL Gore and Cook Medical, research support from Cook Medical, and is a regional aortic advisor for Medtronic with all fees paid to Mayo Clinic. The remaining authors report no conflicts.

REFERENCES

1. Coleman DM, Stanely J. Renal artery aneurysms. *J Vasc Surg*. 2015;62:779–785.
2. Chaer RA, Abularrage CJ, Coleman DM, et al. The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms. *J Vasc Surg*. 2020;72:3S–39S.
3. Altuwaijri TA. Renal artery aneurysms in pregnancy-management of an uncommon but serious vascular lesion. *Semin Vasc Surg*. 2020;32:106–110.
4. Jayet J, Davaine JM, Tresson P, et al. Direct distal renal artery aneurysm repair. *Eur J Vasc Endovasc Surg*. 2020;60:211–218.

Submitted May 5, 2024; accepted Jun 8, 2024.

Additional material for this article may be found online at www.jvscit.org.