Symptomatic Renal Artery Aneurysm Dealt with Aneurysmectomy and Patch Closure

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Renal artery aneurysm (RAA) is a rare disease, and the precise incidence has not been well known. It appears that with the increasing use of diagnostic ultrasound, computed tomography and arteriography, RAA are being identified more frequently than in the past. Rupture of RAA is associated with 10% mortality and the chance of nephrectomy is very high. Although, most of renal artery aneurysms are treated by endovascular technique, surgery is often necessary for aneurysms associated with bifurcation area or large branches. Here, we report a case of saccular renal artery aneurysm which was managed by open surgery.

Key Words: Aneurysm, Renal artery, Surgery

INTRODUCTION

Renal artery aneurysm (RAA) is a rare disease, and the precise incidence has not been well known. The prevalence is reported as 0.1% in the general population, 0.3% in patients undergoing arteriography and 1.3% in hypertensive patients undergoing arteriography (1-3). Four types of RAA have been identified: 1) macroaneurysm, 2) dissecting RAA, 3) aneurysms associated with fibromuscular dysplasia, 4) microaneurysms associated with arteritis (4). Here, we report a case of saccular renal artery aneurysm which was managed by open surgical method.

CASE REPORT

A woman, 22 years of age, presented with intra-abdominal mass, which was detected incidentally on a computed tomography, during a routine health check-up. She also has been suffering from intermittent pain on her flank and epigastrum. She has been free of diseases, including either autoimmune disease or connective tissue disease. She was not taking any medications. She denied smoking and unusual consumption of alcohol. On physical examination at the outpatient clinic, her blood pressure ranged between 140 and 162 in systole and ranged between 90 and 94 in diastole. The examination of other systems did not reveal any abnormal findings. Hematological laboratory findings and renal function tests were found to be normal. A contrast computed tomography (CT) angiogram of the abdomen revealed a large aneurysm in the right renal artery hilum, which was measured as 2.5 cm with wall calcification. Two large first order branches arose from the aneurysm and small branch arose from the top of the aneurysm (Fig. 1). We decide to treat her RAA because it was symptomatic and larger than 2 cm in diameter. All possible treatment modalities, including endovascular and open surgical techniques, were considered and discussed.
Fig. 1. Preoperative computed tomography angiography demonstrates right renal artery aneurysm in axial (A) and three dimensional reconstruction (B).

Fig. 2. Intraoperative image of renal artery aneurysm (A) and the surgical specimen (B).

Finally, we opted for the open surgical method to preserve the first order branches that arose from the aneurysm.

The patient was taken up for surgery and aneurysmectomy along with polytetrafluoroethylene (PTFE) patch closure was performed. A curvilinear upper abdominal incision was made extending from mid-clavicular line, on the left, to the mid-axillary line, on the right. The peritoneal cavity was entered and routine exploration of the peritoneal cavity was done. Thereafter, the small intestine was eviscerated and packed in a bowel bag. Lateral peritoneal attachments of the right colon were incised from the cecum to the hepatic flexure, and the right colon and mesentery were reflected medially. After the duodenum was mobilized medially by Kocher maneuver, an aneurysm was visualized arising from the hilum of the right kidney (Fig. 2). After a meticulous dissection, proximal renal artery and first order branches were all controlled with vessel loops. After injection of intravenous heparin and mannitol, an ampul of furosemide was injected. All vessel loops were doubly looped and tightened to occlude the arteries. Excision of the aneurysm resulted in an ovoid wall defect. The arterial wall defect was repaired with PTFE patch (Fig. 3). The total renal arterial clamp time was only 15 minutes. Meticulous hemostasis was achieved and the wound was closed in layers. A closed suction drain was left around the right kidney which was removed on the 6th postoperative day. The postoperative course was uneventful, except constipation and headache. She was discharged on the 11th postoperative day on anti-platelet, acetaminophen and laxatives. Renal functions including blood urea nitrogen and serum creatinine remained normal. Post-operative CT scan revealed good renal artery without any signs of infarct area (Fig. 4). The pathologic report stated that the specimen was 3.7×2.7 cm in size and 3 mm in thickness, which showed athero-
sclerotic aneurysm with dystrophic calcification. She is doing well without any complication up to 2 months after operation.

DISCUSSION

Jung et al. (5) first reported renal artery aneurysm in Korea in 1981. Although, most of renal artery aneurysms are treated by endovascular technique, surgery is often necessary for aneurysms associated with bifurcation area or large branches (6). The mean age of patients is 60.6 years (range, 4 to 85 years). Aneurysm size ranges from 0.5 to 8 cm (1). Although most aneurysms are detected incidentally, it appears that with the increasing use of diagnostic ultrasound, CT (7), and arteriography, renal artery aneurysms are being identified more often than the past. The rupture risk of RAA is considerably low, no more than 5%, although, more likely in aneurysms that are larger than 2 cm and in non-calcified one (8-12). Rupture of renal artery aneurysm is associated with 10% mortality and the chance of nephrectomy is very high (7). The treatment is recommended for RAA with symptoms, with rapid expansion, and larger than 2 cm in diameter (2,13). Although, endovascular modalities with stent-grafts (12,13) and stent-plus-coil embolization (3,12,16) are usually successful for most simple cases, complex RAAs involving multiple or major branches may require surgical repairs such as extracorporeal reconstruction (2,17). There exist various surgical techniques for RAA repair, including bypass (18), aneurysmectomy, laparoscopic repair (19), and robot-assisted reconstruction (20). Although, Han et al. (6) successfully treated renal artery aneurysm by the excision of the aneurysm and direct anastomosis, our case was treated by aneurysm excision and patch closure. We chose this path because the opening of aneurysm was large and ovoid with the long axis of the defect being parallel with the renal artery axis. So, we decided to repair the arterial wall defect with PTFE patch. We report here a case of surgically repaired renal artery aneurysm with a patch.

REFERENCES

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