Why Open Surgery Is Still the Best Treatment for Juxta- and Pararenal AAAs in Good Risk Patients: Technical Tips

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After the introduction of EVAR in 2007, more than half of AAAs were treated with endovascular repair. However, open repair also remains the mainstay.

AAA repair in Nagoya University
Total 1523 cases (EVAR 735, OPEN 788)

Open repair of juxta-/pararenal AAA (JRAA)
-Nagoya University-

Results: Among 451 elective OS, 111 underwent repair for JPARAAs. In-hospital death was 1 case (0.9%), median operation time: 288 minutes, proximal clamping supraceliac (8 patients; 5.6%), suprarenal (34 patients; 31.5%), inter-renal (69 patients; 62.9%), inter-renal ischemic time: 33 minutes. LRV was divided in 24 patients (22.2%).

Recommendation: This study suggests that open repair of juxtarenal and pararenal aortic aneurysms can be done safely and with low rates of CRD up to 5 years in patients with minimal preexisting renal dysfunction.

Endovascular treatment for JRA
Fenestrated EVAR (FEVAR)
Chimney technique (chEVAR)

Recently, EVAR with fenestrated graft and snorkel technique has been performed for the treatment of JAAA in high-risk patients with favorable outcomes. However, OSR is typically used as first-line treatment in low-risk patients, and fenestrated EVAR (FEVAR) is performed in high-risk patients.

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• I have nothing to disclose
Technical Tips for Juxta- And Pararenal AAAs

1. Operative approach
2. Manipulation of the left renal vein
3. Method of anastomosis
4. Method of reconstruction of the renal artery

Operative Approach

"The positions of proximal clamps were decided based on the anatomy of the aneurysmal neck."

1. Transperitoneal approach
   Proximal Clamp site
   Inter-renal
   Suprarenal

2. Transabdominal left-sided medial visceral rotation approach
   Proximal Clamp site
   Supraceliac

Transabdominal left-sided medial visceral rotation approach

If the orifice of the renal artery and the SMA are at the same level, we choose supra-celiac clamping. In those cases, we use a transabdominal approach with left-sided medial visceral rotation.

Manipulation of Left Renal Vein

1. Dissect the renal vein and control with tape
2. Ligate of the branches (adrenal vein or gonadal vein) for better mobilization of the left renal vein.
3. Divide the left renal vein
   a) Divide the renal vein proximally to the adrenal and gonadal vein.
   b) Close the stump by 4-0 prolene running suture.
4. Re-attach the renal vein after proximal anastomosis

When we need to clamp above the celiac artery, we select this approach.

Using this approach, we can control the orifice of the celiac, SMA and both renal arteries, and therefore, we can directly clamp all of these arteries.

After exposure, the proximal anastomosis was made without PCPS. After finishing the proximal anastomosis, the clamp was then moved down to the graft to perfuse the renal arteries.
Branch dissection and mobilization of the Left Renal Vein

Dissection of the renal vein and ligation of the branches such as the adrenal vein or gonadal vein frees the left renal vein and makes it easier to expose the proximal aorta and to perform proximal anastomosis.

Division of the Renal Vein and re-anastomosis

1) Division and stump closure
2) Re-anastomosis

Divide the renal vein proximally to the adrenal and gonadal vein. Close the stump by 4-0 prolene running suture.

Renal Artery Clamping and Left Renal Vein Division during Abdominal Aortic Aneurysm Repair

K. Komori, T. Furuyama, Y. Maehara

Methods. Between 1992 and 2000, 267 patients had open surgery for infrarenal AAA. Of these, 22 (8%) required temporary bilateral (15) or unilateral (7) renal artery clamping. 8 also had the left renal vein divided, three of which were re-anastomosed.

Results. Renal artery clamping and/or renal vein divisions did not affect the incidence of complications and long term renal failure.

Conclusions. Clamping of the renal arteries and/or renal vein division during AAA surgery does not in itself compromise short or long term renal function.

Freedom from Chronic Renal Decline

LRV division had no significant impact on CRD for up to 2 years during follow-up.

Our result supported the safety of LRV division in terms of the mid-term outcomes.

Proximal Anastomosis

- Posterior-Wall-First anastomosis -

An end to end anastomosis was performed by placing a 3-0 prolene suture in the posterior wall and continued anteriorly in a running fashion.

Reconstruction of renal artery

Renal artery perfusion
1. Cold Ringer solution
2. Passive shunt from brachial sheath

The bypass graft for the renal artery was anastomosed to the main body, or the limb of the main graft, in advance, then the main body was anastomosed to the aorta. During the aorta clamping, the renal artery was perfused with chilled ringer solution.
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