

Renal Auto-Transplantation for Renal Artery Stenosis in a Paediatric Organ Transplant Unit in Singapore: Case Report

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Introduction

Renal artery stenosis (RAS) may cause severe hypertension (HT) that is usually managed with pharmacological interventions and interventional angioplasty procedures. Surgical procedures on the renal artery may be an option to alleviate refractory HT and preserve renal function. Renal auto-transplantation is an uncommon procedure whereby the native kidney is removed from the renal bed, operated upon at the bench and implanted in another location of the body (most commonly, the iliac fossa) of the same patient.

Case Report

Our patient is a 19-year-old male who was diagnosed since the age of 5 years with renovascular HT secondary to bilateral RAS due to fibromuscular dysplasia (FMD). Attempts at (n=3 attempts) bilateral balloon angioplasties at 6-8 years of age were unsuccessful in alleviating the RAS. Furthermore, the angioplasties were complicated by renal artery spasm and acute kidney injury; subsequently rendering the right kidney non-functional. Further interventional procedures were not attempted because of possible risks to the functioning left kidney. Nephrectomy at the age of 19 years for the right non-functioning kidney failed to improve blood pressure control; which was being managed by 6 different antihypertensives.

Surgical Planning

Computerized tomography scan revealed a focal stenosis (60%) along the proximal left main renal artery (LRA) 0.5 cm away from its ostium in the aorta. Further downstream towards the renal hilum, the LRA appeared unaffected by the FMD and the luminal calibre was good.



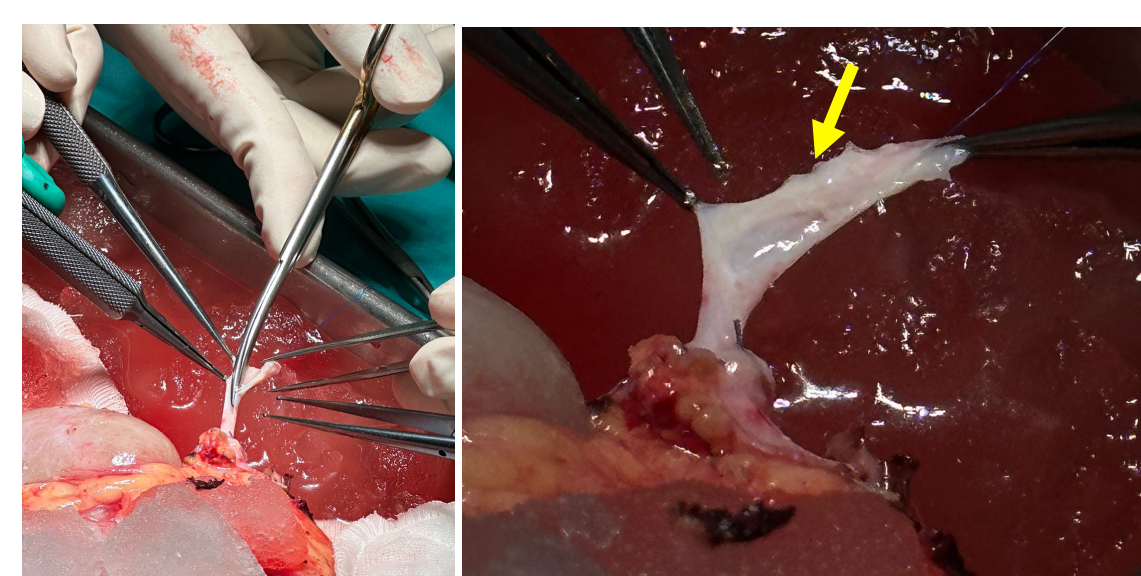
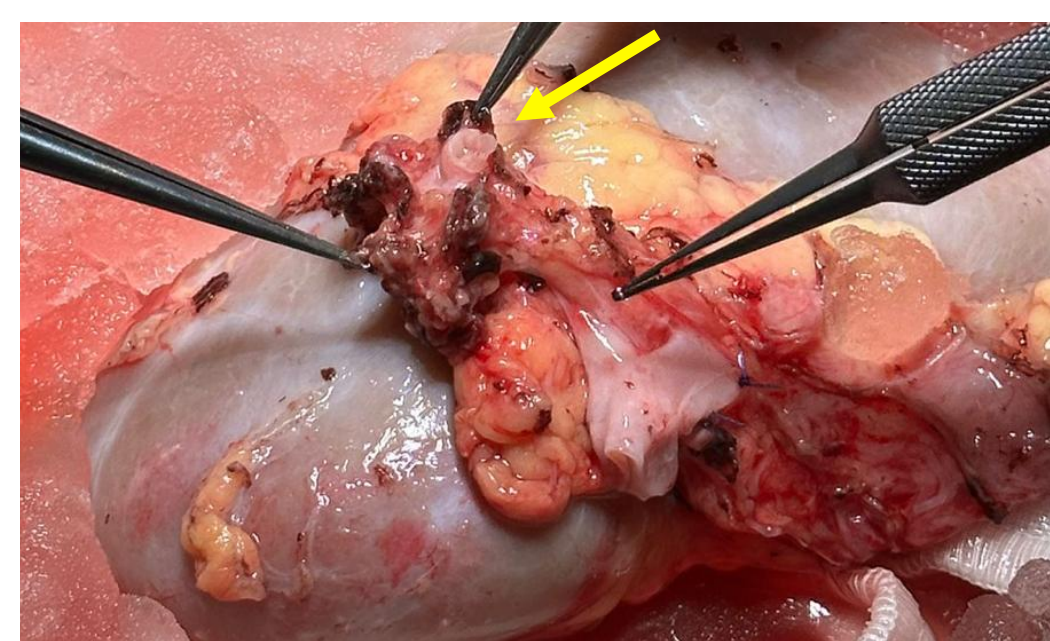
Further to a multidisciplinary discussion involving paediatric and adult renal transplant teams; resection of the short-segment RAS was proposed. To achieve this safely, a renal auto-transplantation was planned. Pre-operatively, we obtained ultrasound mapping of his bilateral saphenous veins as a back-up for reconstruction of the renal artery.

Operative Procedure

Left kidney auto-transplantation was performed as follows;

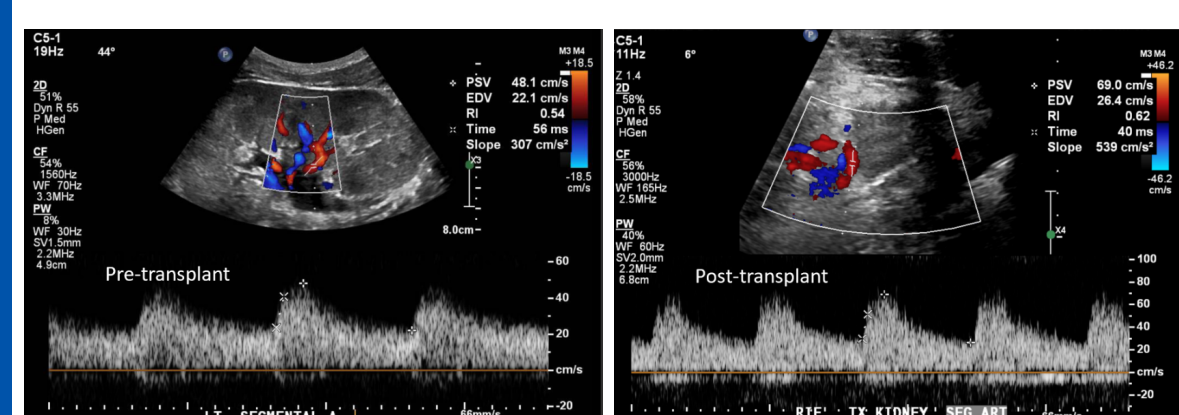
1) Laparoscopic mobilisation of and procurement of the left kidney via a suprapubic incision.
2) Back-bench perfusion with cold(0-4C) preservative solution (Histidine-Tryptophan-Ketoglutarate).

- Resection of the RAS until a normal appearing LRA (2.5 cm stump).
3) Implantation into right iliac fossa as for a standard renal transplant. Extension of the suprapubic incision to a right Gibson incision. The spatulated main LRA was anastomosed end-to-side to the right common iliac artery using 7/0 prolene. Operation duration - 604 minutes
Cold ischaemia time - 106 minutes
Warm ischaemia time - 87 minutes



Post-operative Course

Postoperatively, the BP normalised on-table without the aid of any antihypertensives. The creatinine peaked to 430umol/L on post-operative day 1 and downtrended rapidly thereafter. Rebound HT was managed with weaning doses of labetalol and nitroglycerin infusions. Post-operative ultrasound doppler of the transplanted kidney showed improvement in the peak systolic velocity, normalised resistive indices, with resolution of tardus parvus waveforms.



Our patient was weaned down on antihypertensives during his inpatient stay and was discharged on 4 oral antihypertensives. He continues to be followed up in clinic with weaning doses of medications.

Discussion

RAS is a known indication for renal autotransplantation.¹ FMD accounts for about 50% of the cases of RAS.² Renovascular hypertension was found to be cured or improved in 86.5% of patients; with 62.5% no longer requiring any antihypertensive medications.³ Kidney function was preserved in 88-95% of the cases.²

Conclusion

Meticulous planning, advances in organ preservation, transplant expertise and multidisciplinary management can allow for renal auto-transplantation as a last resort in highly selected patients of RAS due to FMD whose hypertension is refractory to primary management.

References

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