Late Renal Salvage after Endovascular Aneurysm Repair Complicated by Acute Renal Thrombosis

VEITH SYMPOSIUM 2018

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Disclosures

▶ Co-Global Principal Investigation for DEFINITIVE LE
▶ Speakers Panel for Medtronic
▶ Scientific Advisory Boards Spectranetics, Abbott
▶ Endologix, WL Gore, Bolton consultant
▶ Cook Aortic Division
  – IDE fenestrated and branched aortic grafts
  – Proctor

Late Renal Salvage after Complex Endovascular Aneurysm Repair

▶ Renal graft occlusion after open bypass has been associated with a warm ischemia time of ~1-2 hr before irreversible renal ischemia occurs
▶ Reports of renal salvage after variable duration of renal ischemia (hours to months)
▶ Open and Endovascular techniques have been describe in the literature
  – Thrombectomy
  – Angioplasty
  – Stenting
  – Bypass (hepatorenal, splenorenal, antegrade, retrograde)

Delayed hepatopancreatico-splenorenal bypass for renal salvage following malposition of an infrarenal aortic stent graft. J Endovasc Ther. 2010;17:326-31

Late Renal Salvage after Complex Endovascular Aneurysm Repair

▶ Retrospective review of a prospectively maintained database of single surgeon experience
  – 6 year period (2012-2018)
  – All patients who underwent late renal artery stent revascularization after EVAR.
  – 4 patients treated for renal artery thrombosis after Complex EVAR
  – 4 patients referred for renal artery thrombosis after standard EVAR repair

Late Renal Salvage after Complex Endovascular Aneurysm Repair

▶ Retrospective review of a prospectively maintained database of single surgeon experience
  – All renal function was evaluated with a selective combination of:
    • Renal arterial duplex
    • CT scan
    • Renal perfusion scan

Renal duplex served as a method of determining viability
  – Kidney length
  – Presence of distal main renal artery flow
  – Presence of cortical renal flow on power Doppler
  – Resistive index
Late Renal Salvage after Complex Endovascular Aneurysm Repair

- 8 patients
  - 4 males;
- Mean age was 81.8 (range 57-83)
- Mean follow-up was 33 months (range 0.66-58.8)
- Mean duration of ischemia was 35.5 days (range 4-90) prior to intervention
- 4 presented on hemodialysis
  - During follow-up a 3 of 4 patients were able to be taken off HD
- Mean pre-intervention creatinine was 3.6 (range 1-8.42)
- Post intervention mean Creatinine was 1.23 (range 0.98-1.9)

4 patients underwent thrombolysis and new stent placement
3 patient required angioplasty and stenting
1 patient required ilorenal bypass → after failed endovascular intervention

Index Repairs:
- P #1: Complex EVAR → P-branch → Stent occlusion
- P #4: Complex EVAR → 4v snorkel (2014) → Stent occlusion
- P #5: Complex EVAR → 1v FEVAR (2016) → Stent occlusion
- P #6: Standard EVAR → Coverage
- P #7: Complex EVAR → 4v parallel graft → Stent occlusion
- P #8: EVAR with Proximal Aptus Anchors: Coverage of Accessory Branch

Patient #1: Late Renal Salvage after Complex Endovascular Aneurysm Repair

- Patient #1: Complex EVAR → P-branch → Stent occlusion
- 63 y/o M HTN, DM s/p suprarenal fenestrated aneurysm repair (2012) with P-branch
  - Presents to OSH 2 weeks postop with 5 days of left flank pain
  - Delay in transfer due to Hurricane Sandy
  - CT scan with evidence of acute ischemia with left renal branch stent kinking
  - Ischemia time: 14 days

- tPA thrombolysis
- Left renal Angiojet thrombectomy
- Angioplasty
- Stent extension
Patient #2: Late Renal Salvage after Complex Endovascular Aneurysm Repair

- Patient #2: Standard EVAR at OSH → Coverage
- 76 M w/ PMHx of Bladder Ca, Renal Ca (s/p Left nephrectomy-2008), Afib on Coumadin
  - s/p EVAR (1/2018) → right renal artery coverage → occlusion/thrombosis
  - Patient became anuric, developed ESRD → HD
  - Referred by Nephrologist
  - Ischemia time: 45 days
  - 1.22 → Cr 8.42
Patient #2: Late Renal Salvage after Complex Endovascular Aneurysm Repair

- Renal Duplex:
  - Kidney length: 12.93 cm
  - Distal renal flow
  - Cortical flow

Patient #3: Late Renal Salvage after Complex Endovascular Aneurysm Repair

  - Fix of prior kidney donation (Left)
  - Cuff covered remaining renal artery

- 71 F s/p left nephrectomy (donor 1982) s/p EVAR (2008) at OSH for infrarenal aneurysm
  - Developed type 1a endoleak, underwent aortic cuff placement (1/2014) at OSH with right renal artery coverage
  - Developed acute renal failure requiring HD
  - Ischemia time: 30 days

Presented for renal artery revascularization

- 30 days on dialysis
- Renal artery angioplasty & stent placement
- Left brachial access
Patient #3: Late Renal Salvage after Complex Endovascular Aneurysm Repair

- 9 month f/u: off dialysis, Cr 1.0, doing well

Conclusion

1. Renal preservation can occur after prolonged ischemia after EVAR or proximal aortic intervention in selected cases even if patient has gone onto dialysis
2. Need to show preservation of some renal function by split renal function, renal duplex arterial flow or contrast enhancement on CTA.
3. Don’t give up on the covered renal or occluded renal stent

Thank you