Development in endovascular treatment of complex juxtarenal aortic aneurysm disease

Introduction
Endovascular treatment options with fenestrated and branched stentgrafts increasingly rival open surgery for complex abdominal aortic aneurysms (AAA). Fenestrated stentgrafts are individually tailored to each patient while a more readily available “off-the-shelf” fenestrated or branched stentgraft is often suitable in more urgent settings. With increasing experience operative techniques change and evolve. Objective evaluation of patient outcome and technical success is important as the treatment for AAA is reshaped.

Methods
Paper I: All patients treated with FEVAR for abdominal aortic aneurysm (AAA) in two referral centers were enrolled. Data from early and late experience was retrospectively analyzed and compared for differences in operative results and one-year outcomes.
Paper II: All patients re-operated with a proximal fenestrated or branched cuff after previous infrarenal endovascular or open repair from two tertiary referral centers between were included. Data was retrospectively collected from chart review and digital imaging.
Paper III: Patients treated with COOK Zenith® P-branch® in were enrolled in a database prospectively. Operative and follow-up data was collected and analyzed.
Paper IV: Computed Tomography images of 47 patients previously treated with FEVAR were revised and used for re-planning of a fenestrated stentgraft. Differences between the original and revised stent graft planning were analyzed.

Results
With increasing experience stent graft configuration was more complex due to increased number of fenestrations/scallops incorporated in the graft design (2.7±0.8 vs. 3.2±0.7, p< .001). Despite this, contrast volume and radiation time decreased while procedure time remained unchanged.
The indications for proximal endovascular repair with fenestrated or branched cuff were type 1 endoleak (56%), proximal aneurysm formation (30%) and stentgraft migration (12%). Technical success was accomplished in 93% of cases. 30 day mortality was 0% and 1 year mortality was 5%.

Conclusion
With increasing experience, FEVAR design has become more complicated with more visceral vessels targeted for better proximal seal while operative risk still remains low. Simultaneously, radiation time and contrast volume has been reduced with possible long-term benefits for the patient.
An endovascular approach with fenestrated or branched stentgrafts for treatment for proximal endoleak, proximal aneurysm formation or pseudoaneurysms after previous infrarenal repair seems to be a valid alternative to open surgery.
Published papers:

**Early versus late experience in fenestrated endovascular repair for abdominal aortic aneurysm.**
Sveinsson M, Sobocinski J, Resch T, Sonesson B, Dias N, Haulon S, Kristmundsson T.
PMID: 25595398

**Juxtarenal Endovascular Therapy with Fenestrated and Branched Stentgrafts after Previous Infrarenal Repair**
Sveinsson M, Kristmundsson T, Dias N, Sonesson B, Mani K, Wanhainen A, Resch T
Manuscript under consideration, J Vasc Surg.