Complex Endovascular Aortic Repair for an Abdominal Aortic Aneurysm with Severely Angulated Neck

Chong Li MD
John Charitable MD
Thomas Maldonado MD
Disclosure

• TM is consultant for Gore, Medtronic
Introduction

• Endovascular aortic repair (EVAR) has improved short term outcome vs. open surgery - shorter hospitalization, lower 30-day mortality, and quicker return to previous functional status.¹⁻³

• Anatomic considerations (neck angulation greater than 60 degrees) precluded the use of EVAR, with open treatment remaining the only option.⁴

• Many patients undergoing EVAR violates the instructions for use (IFU) for standard devices.⁵

• Snorkel/periscope, physician modified endografts, laser fenestrations, and other adjuncts…⁶⁻⁸
Introduction

• Treating an AAA using a thoracic aortic endoprosthesis has not been previously reported.

• This case - Infrarenal AAA complicated by severely angulated neck, successfully treated with Gore TAG Conformable Thoracic Stent Graft (C-TAG) with Active Control System (W.L. Gore & Associates, Inc, Flagstaff, AZ), and adjunctive Heli-FX EndoAnchor System (Medtronic Vascular, Minneapolis, MN) for fixation.

• Patient consent was obtained.
HPI

- 81 year old Caucasian female with a history of intermittent constipation who presented to an outside hospital with weight loss, abdominal pain, and diarrhea. A CT scan was performed and demonstrated a hypervascular rectal mass as well as an 8.0 cm AAA with a roughly 90 degree angulation of the proximal neck.
Assessment

• On presentation, patient had a large pulsatile midline abdominal mass. Anemic with a hemoglobin of 10.4 g/dL.

• Given her age, recent weight loss, rectal mass which was highly concerning for malignancy but significant aneurysm rupture risk, we sought an endovascular solution to treat her AAA, allowing her rectal mass to be subsequently treated in short interval.
Plan

• 28 mm x 28 mm x 11 cm Gore TAG Conformable Thoracic Stent Graft with Active Control System to seal the proximal neck.

• Given lack of active fixation mechanism, adjunctive Medtronic Heli-FX Endoanchors.

• Gore Excluder 31 mm x 14 mm x 15 cm bifurcated endograft, 12mm x 10 cm left limb extension.
Execution

- After first stage deployment we sequentially increased the angulation of the device using the Active Control System until we noted excellent seal on the inner curve through the highly angulated neck.
Execution

• 4 Medtronic Heli-FX Endoanchors were placed through the graft fabric at the proximal end of the stent-graft. Completion angiography demonstrated complete exclusion of the aneurysm sac without evidence of endoleak.
Post-op Course

• The patient recovered well, underwent flex sig during the same stay, and discharged on POD4

• CT scan 3 weeks post-op demonstrated excellent seal without evidence of endoleak.

• Subsequently underwent transanal excision of the rectal mass with pathology revealing invasive adenocarcinoma.
Discussion

• >75% of all elective AAA repairs under go EVAR.\textsuperscript{9}

• Most commercially available endoprostheses require at least 10-15 mm of proximal seal in addition to less than 60 degrees of angulation at the aortic neck.

• Besides IFU, also important to consider individual patients risk profile including medical comorbidities, and life expectancy.

• For our patient, it was important to find an endovascular solution to treat her aneurysm given her comorbidities and need for short recovery for her subsequent rectal cancer treatment.
Discussion

• Gore C-TAG with Active Control can ensure a tight seal across the inner curve of the thoracic aorta.\textsuperscript{10}

• However, without the active fixation barbs of most AAA endografts.

• Medtronic Heli-FX EndoAnchors have been previously shown to be effective at protecting against type Ia endoleak with a technical success rate of 96.5\%, similar success was also seen when used to treat post-operative type Ia endoleak.\textsuperscript{11}

• The remainder of the repair completed using a standard Gore Excluder bifurcated endograft placed inside the thoracic stent graft.
Limitation

- GORE® EXCLUDER® Conformable AAA Endoprosthesis with ACTIVE CONTROL System now available.
- Minimum aortic neck length of 15 mm when proximal aortic neck angulation is $\leq 90^\circ$
- Not available during this time.
- Longer followup needed.
Conclusion

• This case demonstrates the safe and effective deployment of a thoracic endoprosthesis in the infrarenal aorta in order to seal a highly angulated proximal neck, with adjunctive EndoAnchors to provide active proximal fixation.

• Avoided risks of open aortic surgery, and granted short recovery.

• With careful planning, future complex endovascular solutions to treat challenging aortic anatomy will continue to benefit the patient, even if the device is extended outside its IFU.


Thank You