A New “Gutterless” Off-The-Shelf Device For Treating Pararenal And Paravisceral AAAs With Chimney EVAR: Concepts

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Introduction

- Juxtarenal, pararenal and thoracoabdominal aortic aneurysms compromise 15-20% of all aneurysm repairs.
- There are many infrarenal AAA endografts which have undergone iterative improvements over the past 25 years.
- Today there is only 1 commercially available fenestrated endograft in the US, Z-fen, which still requires 6-8 weeks.
- It has been 25 years since Juan Parodi, MD invented the endograft, but small advances have been made in this arena.
- Branch vessels grafts have been in IDEs for over a decade and require significant manufacturing time and high expertise. They still are not commercially available.
- We need an off the shelf, self adjusting, endoleak free, “gutterless,” visceral endograft.

Results:
- 8.1% intraop type 1 endoleak
- 30 day mortality 4.9%
- 3 year survival 75%
- Early 94% primary patency
- Cases done in high volume centers with clinical experts.
- Lobado Sandwich technique has shown promise, but is similar to above.

Issues with Chimneys, Snorkels, and Periscopes

- Full compliment and sizes of stents not readily available.
- Technical details not standard, 3-4 multiple access points.
- Type Ia and Ib endoleaks common.
- Widespread use has resulted in multiple specialties “DABBING” in this area, with inferior results.
- We have recently seen an onslaught of complications and ruptures of CHEVAR grafts from type 1 endoleaks done by non vascular specialties.
Initial Concept
- Make the chimney part of the stent so it eliminates the leak.
- Make it auto adjusting so it can be off the shelf.
- First 2-3 stents and chimneys on the inside to keep main body diameter uniform.

Auto Adjusting “Pipe Fitter”
- The chimney is part of the stent and unfurls based on the branch stent diameter. It is easily crimped.
- The “chute” conforms or unswirls like a pipe fitter, allowing for a seal

Finite Element Analysis

Demonstration

First Prototypes