EndoAnchors can facilitate and maintain successful standard EVAR for AAAs with challenging proximal necks

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Disclosure

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I have the following potential conflicts of interest to report:

☒  Consulting
☐  Employment in industry
☐  Stockholder of a healthcare company
☐  Owner of a healthcare company
☐  Other(s)

☐  I do not have any potential conflict of interest
Endoanchors for patients without suitable anatomy

• Are we applying EndoAnchors to facilitate and maintain successful standard EVAR for AAAs with challenging proximal necks?
  YES

• Are we creating a neck with endoanchors?
  Sometimes,
  (Dilemma between proximal neck versus sealing zone)
Four Subjects

• Why ESAR?
• In whom?
• Preliminary Anatomical Study
• Importance of Technical Details
Why ESAR (Endosuture Aneurysm Repair)?

• Standard EVAR is not enough for patients with
  • Unsuitable proximal neck anatomy
  • Proximal neck within the IFU but with high risk of late endoleaks (≥30mm diameter)
  • Spanos et al: 9% incidence of proximal migration after infrarenal EVAR over a 3-year period, 22% were accompanied by a type Ia endoleak.

• FEVAR is too aggressive for patients with infrarenal AAA
  • Mortality <5%
  • Morbidity ≈15% (associated to renal complications, like insufficiency, occlusion, stenosis, kinking, redo)

• Per ROC curve analysis, a diameter greater than or equal to 30mm at D5 (1cm below the LRA) was identified as the best cutoff point to the risk of late type IA endoleak (sensitivity 87.5% and a specificity of 82%, LR +5 and LR-0.15).
  Ferreira LM el al. RSAC 2018
Evidence demonstrating safety and efficacy

Influence of aortic neck characteristics on successful aortic valve penetration of EndoAnchors in therapeutic use during endovascular aneurysm repair

EndoAnchors demonstrate effectiveness in obstructing aortic neck flow and preventing aneurysm neck dilatation. Patients with aortic aneurysm and aortic neck dilatation are treated with the EndoAnchors implant system, which involves the following steps: (1) aortic neck measurement and characterization; (2) EndoAnchors selection and customization; (3) EndoAnchors implantation; and (4) post-operative evaluation.

**Abstract**

EndoAnchors are a novel, minimally invasive, endovascular aortic device designed to treat aortic aneurysms. The device is comprised of a self-expanding stent-graft with integrated anchors that are deployed distal to the aortic neck. This minimizes the risk of endoleak and allows for accurate deployment of the graft within the aneurysm sac. The EndoAnchors system has been shown to be effective in reducing aneurysm size and preventing aneurysm enlargement.

**Intervention**

EndoAnchors demonstrate effectiveness in obstructing aortic neck flow and preventing aneurysm neck dilatation. Patients with aortic aneurysm and aortic neck dilatation are treated with the EndoAnchors implant system, which involves the following steps: (1) aortic neck measurement and characterization; (2) EndoAnchors selection and customization; (3) EndoAnchors implantation; and (4) post-operative evaluation.

**Results**

The EndoAnchors system has been shown to be effective in reducing aneurysm size and preventing aneurysm enlargement. The device is comprised of a self-expanding stent-graft with integrated anchors that are deployed distal to the aortic neck. This minimizes the risk of endoleak and allows for accurate deployment of the graft within the aneurysm sac.

**Conclusion**

EndoAnchors are a novel, minimally invasive, endovascular aortic device designed to treat aortic aneurysms. The device is comprised of a self-expanding stent-graft with integrated anchors that are deployed distal to the aortic neck. This minimizes the risk of endoleak and allows for accurate deployment of the graft within the aneurysm sac. The EndoAnchors system has been shown to be effective in reducing aneurysm size and preventing aneurysm enlargement.

**References**


ANCHOR Registry: Primary Arm (N=716 pts)

- No migration through 4 years
- Type IA endoleak at 4 years: 3.4% (4/117)
- Through 4 years, freedom from 2nd Endo Proc to treat Type IA’s: 97.7%
In Whom?

• Patients with
  • *Wide and Conical Necks*
    • Apposition of the endograft for ≥10mm
  • *Enlarging necks during FU*
    • PN more than 32mm diameter or associated to sac enlargement due to type II endoleaks
• *Patients with high risk of endoleak due to clinical factors*
  • Anticoagulation therapy, who will have a difficult follow up, ”fragile” people with high risk to be re-intervened or followed up or “young” patients
Wide and long Neck

• 65 y/o male. PMH: Stable CAD and HIV+ with enlarging AAA
Mild dilatation of the pararenal aorta and the proximal infrarenal neck without a proximal endoleak after 3 years
Shrinkage of the aneurysmal sac

June 2017

April 2018

June 2020
Enlargement of the proximal neck with a type II endoleak and *enlargement of the sac >10mm*

- **Type II Endoleak**
- **EndoAnchors at the proximal neck**
- **Embolization of the TIEEL w/coils y Onix®**
- **No migration**
- **No enlargement of the neck**
- **Shrinkage of the sac**
Open Surgical Conversion due to endotension

• 1st STEP
  • R retroperitoneal approach
  • Banding of the CIA
Open Surgical Conversion

• 2nd Step
  • L retroperitoneal mini-laparotomy
  • sacotomy,
  • Ligation of the IMA, upper lumbar arteries and oversew of the sac wall
Preliminary Anatomical PN Analysis

• The aortic diameters were measured, at the level of the celiac trunk (D1), superior mesenteric artery (D2), renal arteries (D3 and D4), 1 cm below the lowest renal artery (D5), maximal aneurysmal sac (D6).

• Preoperative and last follow-up aortic diameters were compared by paired t-test.
Preliminary Anatomical Analysis of the Yuxtarenal aorta

- Yuxta-visceral aortic dilatation was universal in the three groups from D1 to D4.
- At the level of D5 (1cm below LRA), while in the EVAR group the aorta underwent a statistically significant growth [25.18 ± 5.55mm vs 27.45 ± 6.64 mm (p = .01)], in the ESAR group the aortic neck remained stable [30.91 ± 8.53 vs 32.27 ± 10.46 mm (p = .16)], and in the FEVAR group, D5 increased the diameter from 32.22 ± 7.51 mm (p = .08), again without significancy.
Technical Details

• The only predictor on multivariate analysis for two or more EndoAnchors with inadequate aortic wall penetration was being an occasional user.

In this subcohort of ANCHOR patients, almost 30% of the EndoAnchor implants had maldeployment.


Conclusion – Endoanchors

• Our mid-term experience suggests that EAs can stabilize high-risk seal zones, with significant sac regression.

• ESAR has shown low rates of migration and type I endoleak, probably reflecting the absence of significant dilatation of the yuxtarenal aorta.

• However, EA use in hostile neck anatomy should not be considered an easy approach. Maldeployment can be prevented by careful preoperative planning and measured intraoperative deployment.