

Early bi- and three-dimensional aneurysm sac variation in predicting long-term EVAR results

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Disclosure

Speaker name:

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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**

Aim

Evaluate the impact of **bi-** and **three-dimensional** **preoperative morphologic features** and their immediate **post-operative variations** on the **outcome** of elective AAAs treated by **standard EVAR** procedures



Materials and methods

Bi- and three-dimensional Criteria

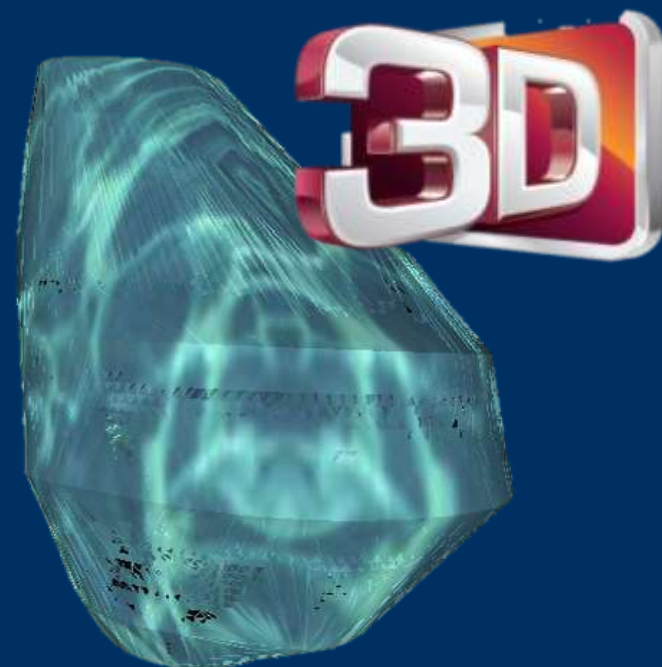
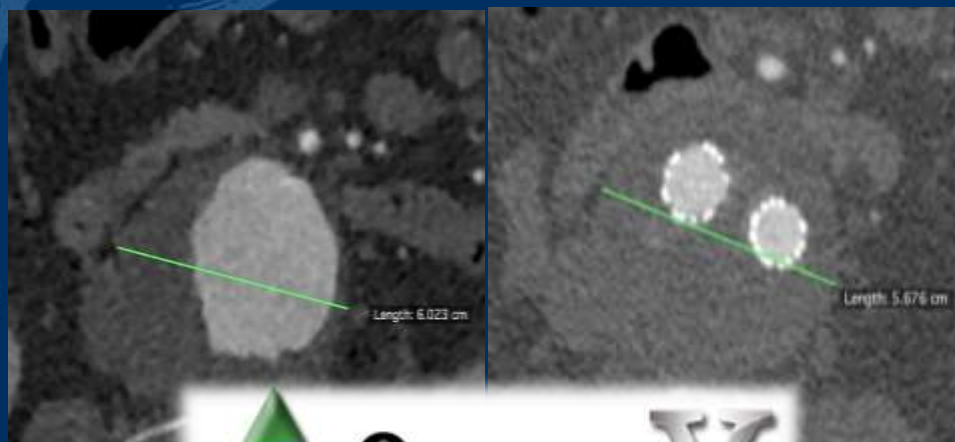
Preoperative and 1-month CTA

Aneurysm diameter (AD)

Aneurysm volume (AV)

Δ diameter (%)

Δ volume (%)



Outcome measures

Primary technical success

(successful implantation of a stent graft in the absence of surgical conversion, intraoperative mortality, type I or III endoleaks, and stent graft migration, or occlusion at completion angiography)

30-day, 1-year, and mean FU re-intervention, all-cause, and AAA-related mortality rates

(complications requiring re-intervention: type I or III endoleaks, type II endoleaks with sac enlargement > 5 mm, and graft or access vessel occlusion)

Demographic data and risk factors

333 Pts from September 2012 and September 2017

	333 Pts	%
Age (mean, SD)	73.9 (\pm 7.7 years)	
Male Sex	303	91
Hypertension	285	85.6
Dyslipidemia	252	75.7
Diabetes	46	13.8
CAD	46	13.8
Smoke	218	65.6
COPD	84	25.2
CRI	87	26.1
PVD	37	11.1

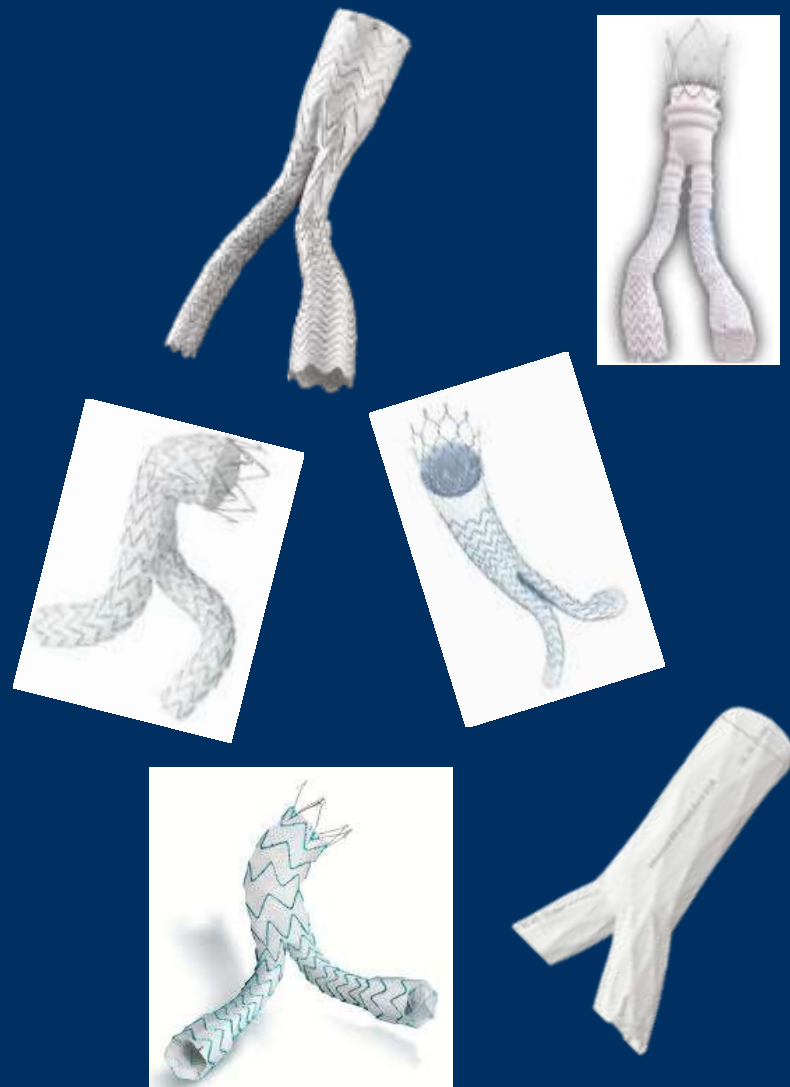


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Stent-grafts

	333 Pts	%
Excluder and C3 (W.L.Gore & Associates)	123	36.9
Endurant I and II (Medtronic Inc)	57	17.1
Zenith LP and Alpha (Cook Medical)	54	16.3
Ovation (Endologix)	45	13.5
AFX (Endologix)	28	8.4
Treovance (Bolton Medical)	12	3.6
Incraft (Cordis Corp)	12	3.6
Anaconda (Vascutek/Terumo)	2	0.6



Early results

Primary technical success was achieved in **all cases**
No in-hospital mortality was recorded in the present series



At **30-day**

re-intervention was required in **7 pts (2.1%)**
and **3 pts died (0.9%) without AAA-related deaths**

Long-term results

Mean follow-up period was **34.9 months \pm 24.3** (12–83)

Overall **re-intervention** rates were **12.0% (n=40)**

Mortality rates were **7.2% (n=24)**

Without AAA-related deaths during the entire study period

Re-interventions

Re-intervention for EL were **62.5% (25/40)**

	Reinterventions	Treatment
30-day n=7	1 Femoral pseudoaneurysm 1 Partial renal occlusion 2 Limb occlusion	Surgical repair Renal stenting Fibrinolysis and limb stenting

Type IA EL 8 (2.4%)

	1 Type IB EL	Iliac extension
1-year n=10	2 Limb occlusion 1 Bilateral limb occlusion 3 Type II EL	Fibrinolysis and limb stenting Fibrinolysis + Fem-fem bypass 1 ARA and lumbar aa. Glue embolization

Type II EL 13 (3.9%)

	1 RIBAD	Infraco-abdominal open repair
Long-term n=23	2 Type IB EL 5 Type IA EL 10 Type II EL	Limb extension 2 Open conversion 3 Proximal cuff + RAAAs chimney 2 Semiconversion 4 Transcatheter aortic valve replacement

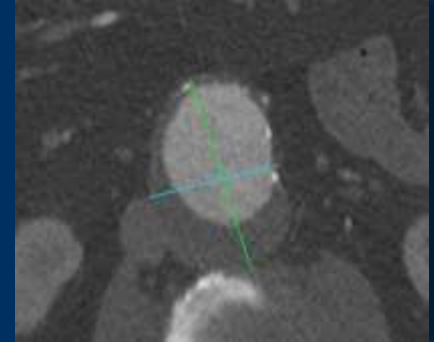
Open Conversion 4 (1.2%)

	1 Limb stenosis 1 Type III EL	Fogarty and limb stenting Limb stenting Limb relining
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Bi- and three-dimensional results

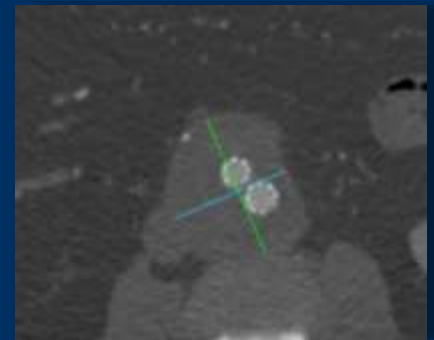
@ Preoperative CT scan

- **Mean Aneurysm Diameter** 50.4 mm \pm 11.8 (43.1-91.8 mm)
- **Mean Aneurysm Volume** 112.9 cm³ \pm 79.5 (39.7-574.3 cm³)



@ 1 month CT scan

- **Mean Aneurysm diameter** 49.1 mm \pm 12.1 (35-95.8 mm)
- **Mean Aneurysm volume** 112.1 cm³ \pm 80.5 (29.3-568.4 cm³)



Following previously experiences **cut-off values** for analysis were:

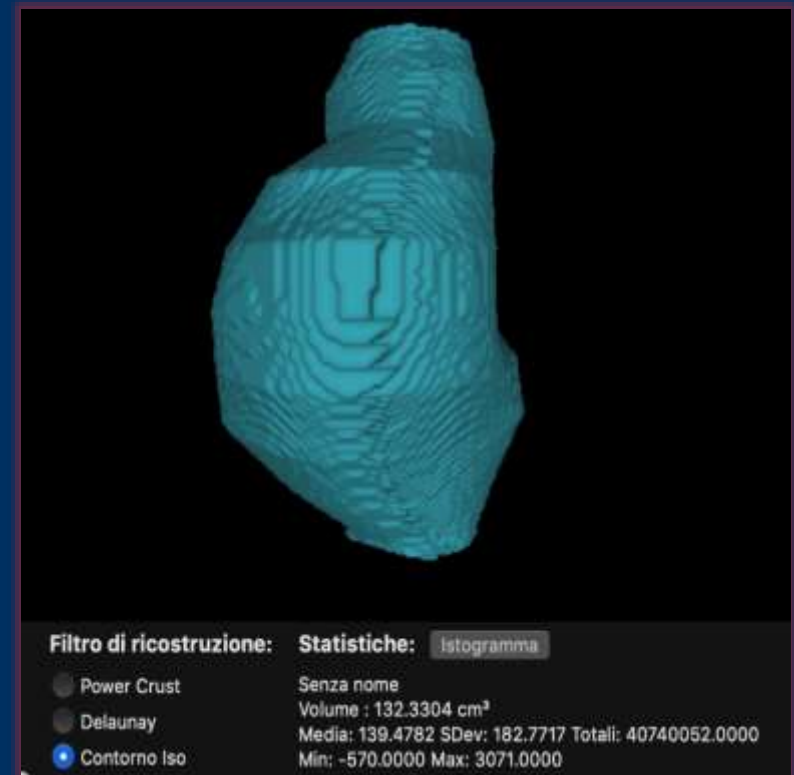
AAA Diameter >59 mm

AAA Volume >159cm³

Bi- and three-dimensional results

Mean bi- and three-dimensional variations:

- Δ_{diameter} 2.4% \pm 8.0 (-27.2 - +32.9)
- Δ_{volume} 1.0% \pm 12.4 (-75.3 - +45.6)



For both Δ , a negative value indicating a postoperative increase in diameter and/or volume was taken as threshold for the present analysis

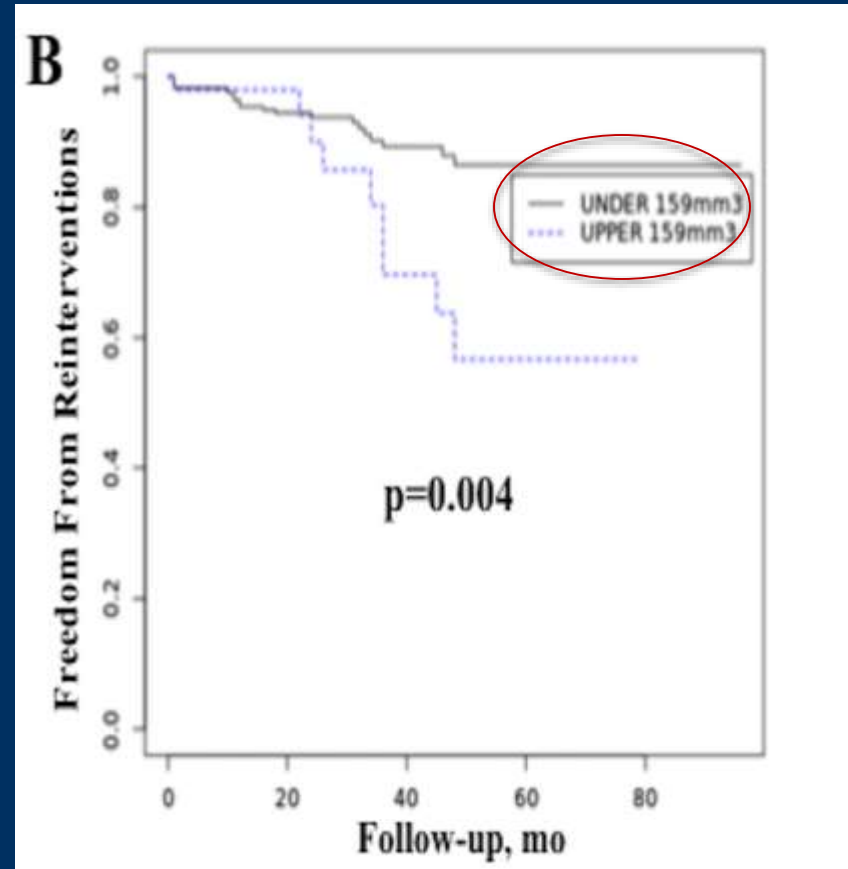
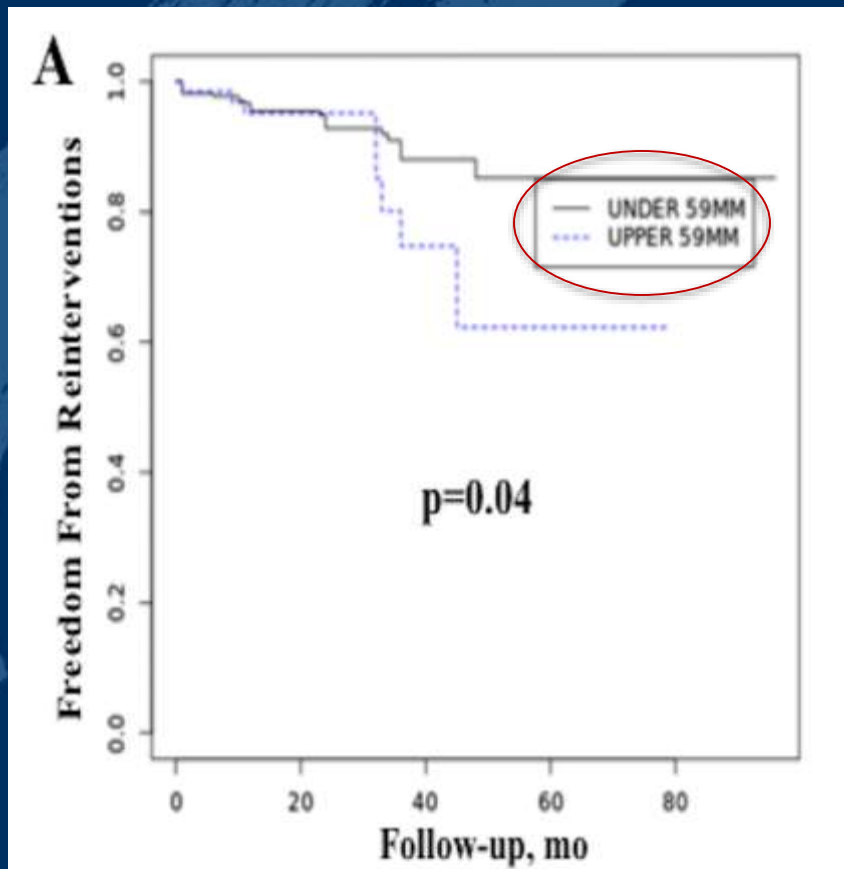
Bi- and three-dimensional results

	Diameter >59 mm	Volume >159cm³	-Δ diameter 1 month	-Δ volume 1 month
Reinterventions	p=0.04 OR:2.08 CI95%=0.99-4.37	p=0.004 OR:2.87 CI95%=1.34-6.13	p<0.001 OR:4.71 CI95%=2.24-9.81	p<0.001 OR:5.80 CI95%=2.52-13.31
Deaths	ns	ns	ns	ns
Reinterventions and deaths	p<0.01 OR:2.21 CI95%=1.18-4.15	p<0.004 OR:2.58 CI95%=1.33-5.02	p<0.007 OR:2.18 CI95%=1.22-3.89	p=0.001 OR:2.37 CI95%=1.40-4.01

Bi- and three-dimensional results

Diameter (59 mm)

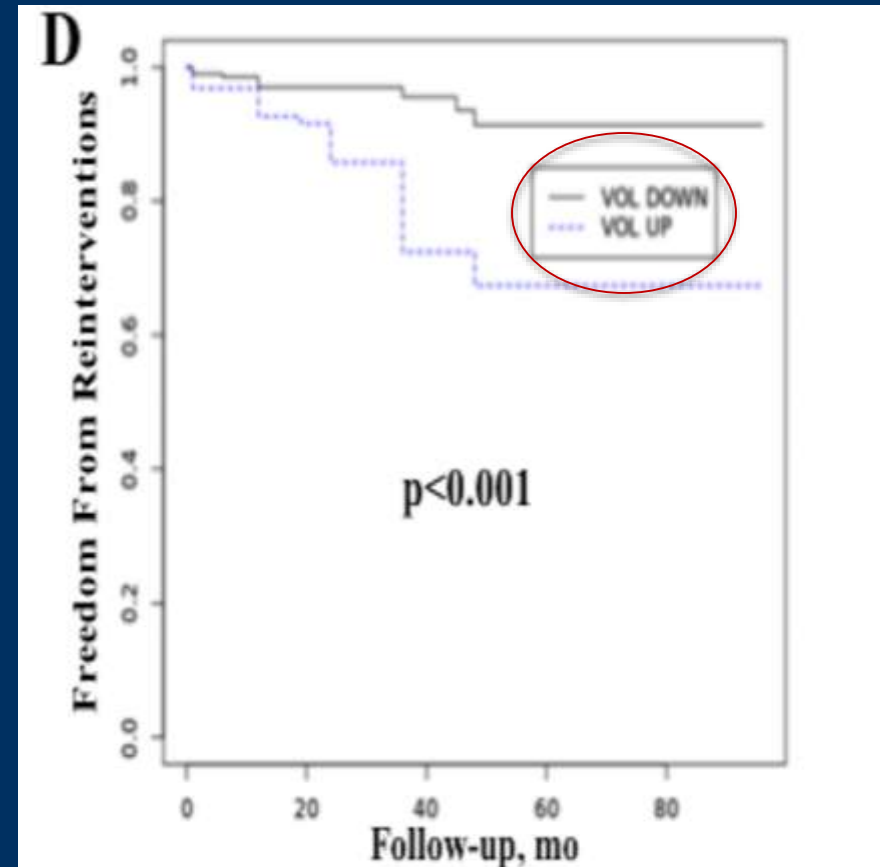
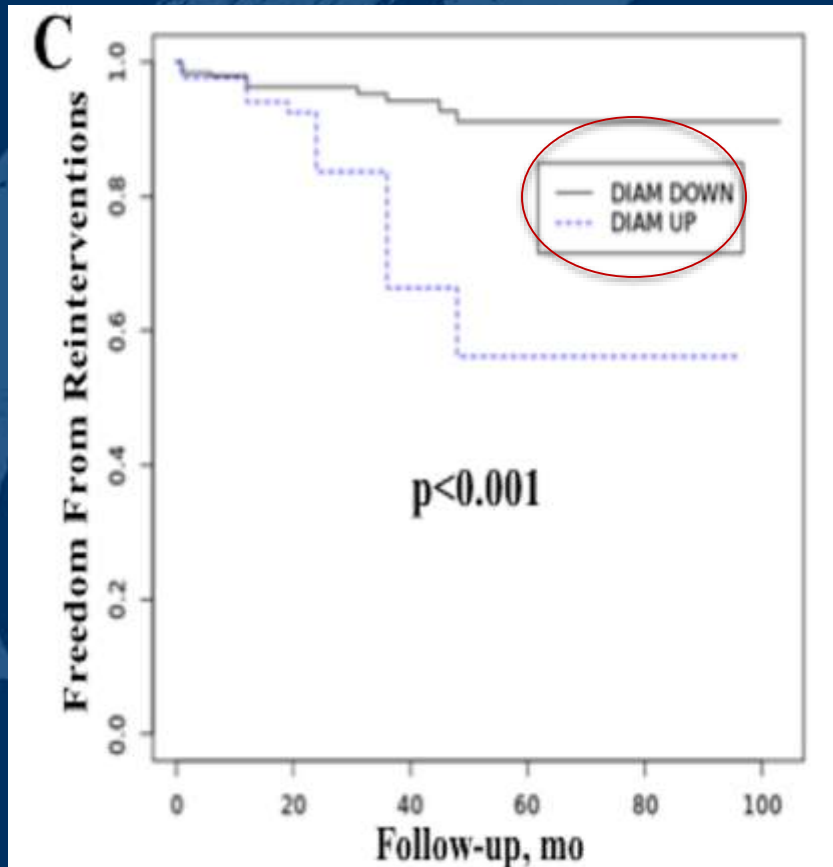
Volume (159 mm³)



Bi- and three-dimensional results

Δ diameter

Δ volume



Conclusions

Preoperative aneurysm diameter and **volume** could predict the outcome of EVAR

The **increase of postoperative aneurysm diameter and volume** are strongly **associated** with a significantly greater risk of **re-intervention** during FU

These findings could highlight a **subpopulation** of patients at risk of complications that deserve a **closer follow-up...**

...Or reducing the need for **unnecessary control** in those with immediate aortic remodelling, potentially **reducing costs** and **radiation exposure**

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