CHIMPS AND REGULAR ARE STILL A VALUABLE OPTION FOR ARCH REPAIR

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Disclosure

Speaker name:

.....SONIA RONCHEY.....

I do not have any potential conflict of interest

DO THEY WORK?

Born as a rescue

..unintended coverage of aortic arch branch

OUR EXPERIENCE

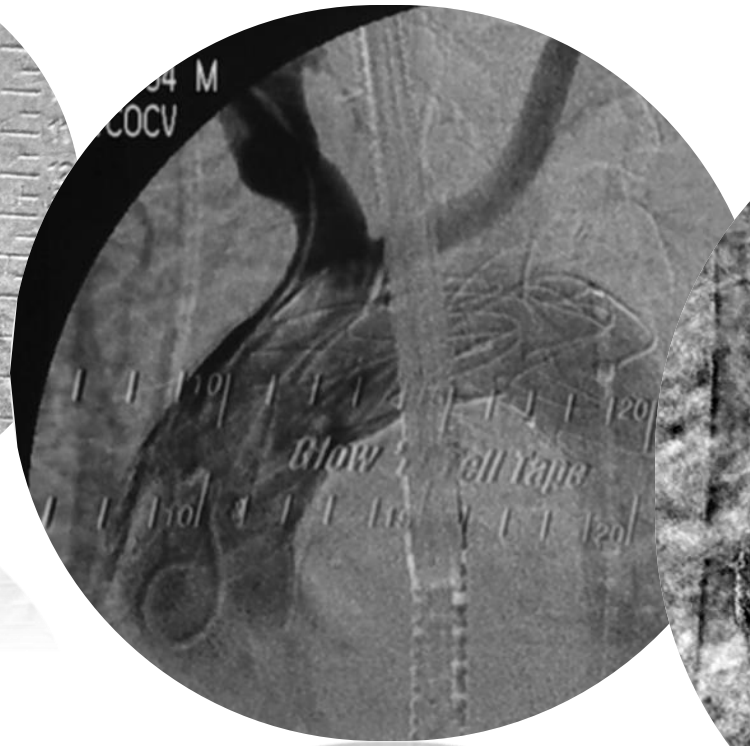
1. 06/2002 overstenting of the LCCA
2. 12/2002 overstenting of the IA

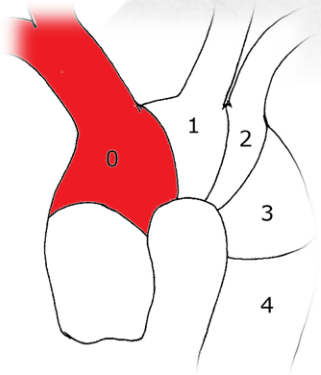
OVERTSENTING
INNOMINATE ARTERY

IA coverage

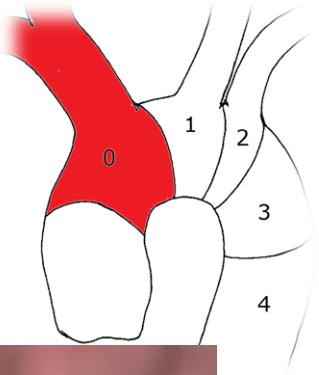
TRANS-BRACHIAL

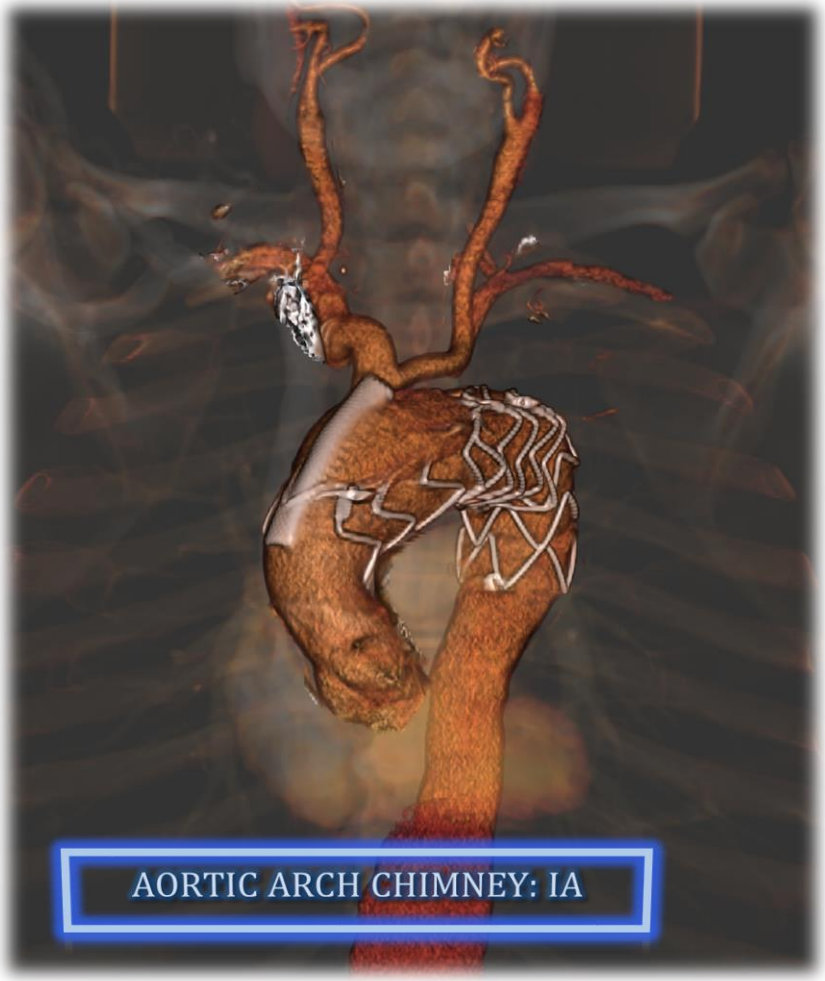
WALLSTENT 11-70

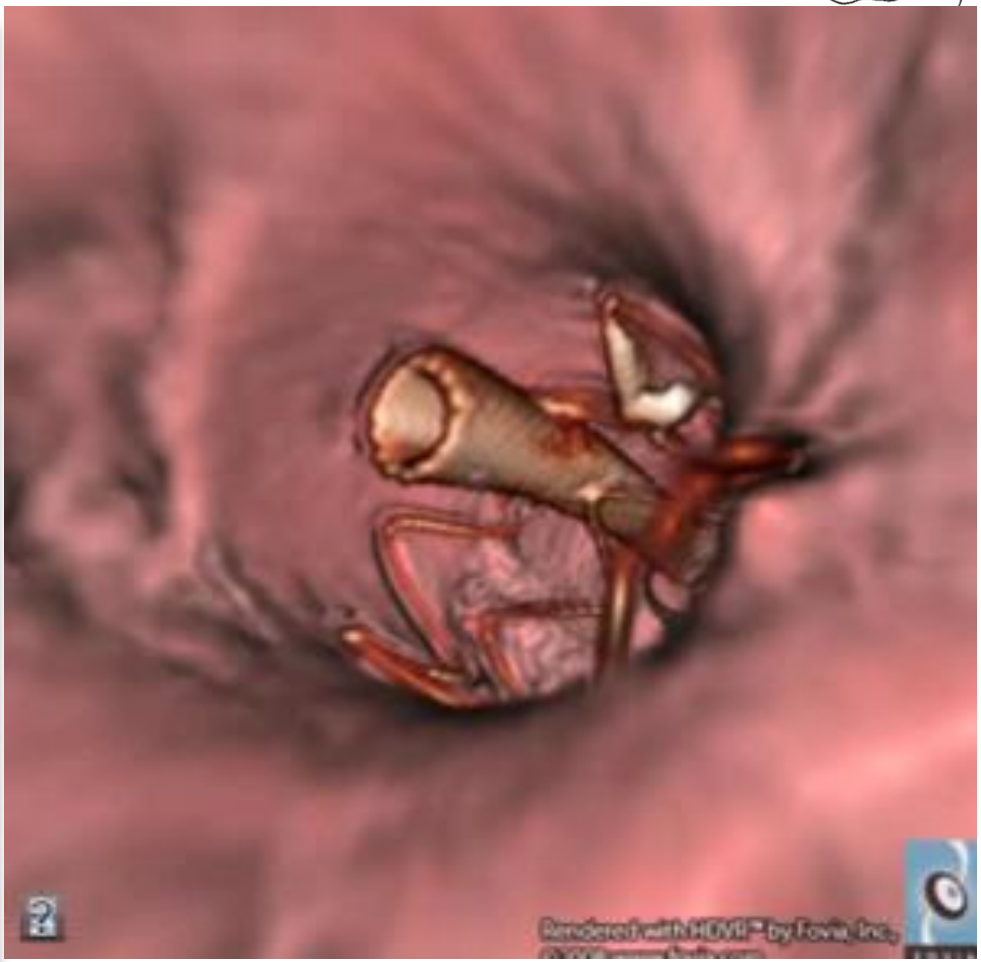




DEATH AT 12 YRS







DO THEY WORK?

Chimney Technique for Aortic Arch Pathologies: An 11-Year Single-Center Experience

Nicola Mangialardi, MD; Eugenia Serrao, MD; Holta Kasemi, MD; Vittorio Alberti, MD; Stefano Fazzini, MD; and Sonia Ronchey, MD, PhD

Department of Vascular Surgery, San Filippo Neri Hospital, Rome, Italy.

- TECHNICAL SUCCESS 36/36 100%
- MORTALITY 3 8.3%
- PROCEDURE REL COMPLICATIONS 4 11.1%
  - MINOR STROKE (2 RUPT-1 ELECT) 3
  - PARAPARESIS 1
  - EARLY TYPE I EL 0

J Endovasc Ther. 2014;21:312–323

DO THEY WORK?

Chimney Grafts in Aortic Stent Grafting: Hazardous or Useful Technique? Systematic Review of Current Data

B. Lindblad *, A. Bin Jabr, J. Holst, M. Malina

Department of Vascular Diseases, Skåne University Hospital, Malmö, Sweden

364 ARCH CHIMNEY

MORTALITY	4%
EARLY TYPE I EL	11%
(15 OBSERVED: 7 SELF SEALED – 17 TREATED: 14 EV+ 3 CONVERSION)	
PROCEDURE REL COMPLICATIONS	8%
CH-G PATENCY (17 MTHS)	97-99%
LATE TYPE I EL (>30 DAYS)	4%

DO THEY WORK?

Chimney Grafts in Aortic Stent Grafting: Hazardous or Useful Technique? Systematic Re

B. Lindblad *, A. Bin Ja

Department of Vascular Disea

MORT 4%

EARLY 11%

(15 OBSE ERSION)

CH-G I 7-99%

LATE ' 4%

“TECHNICAL RULES”

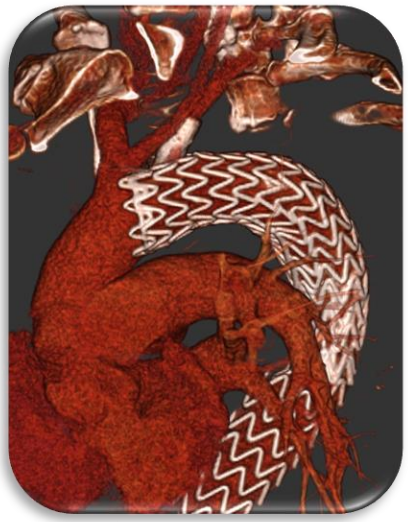
- GRAFT CHOICE (MAIN/PARALLEL)
- VESS TAKE-OFF → CHIMNEY/PERISCOPES/SANDWICH
- AVOID GUTTERS
  - OVERSIZING
  - CHIMNEY LENGHT OVERLAPPING
- CHIMNEY PATENCY
  - CONFORME/REINFORCE
- SAFE LANDING ZONE (ANGLES/AORTIC WALL)
- FOLLOW UP

MAIN GRAFT CHOICE

THOR/ S-G radial force

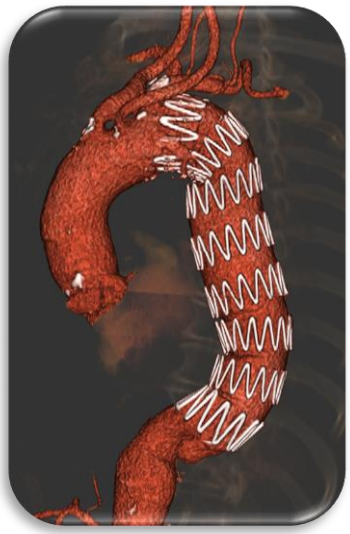
	Medtronic Valiant Thoracic Stent Graft	GORE TAG Thoracic Endoprosthesis	COOK Medical Zenith TX2 TAA Endovascular Graft	Bolton Medical RELAY
Proximal sealing zone	100	30	40	38
Distal sealing zone	42	30	43	15
Body spring	41	31	9	23

CONFORMABILITY & MATERIAL FATIGUE



28

(9 TAG +18 c-TAG)



3

4

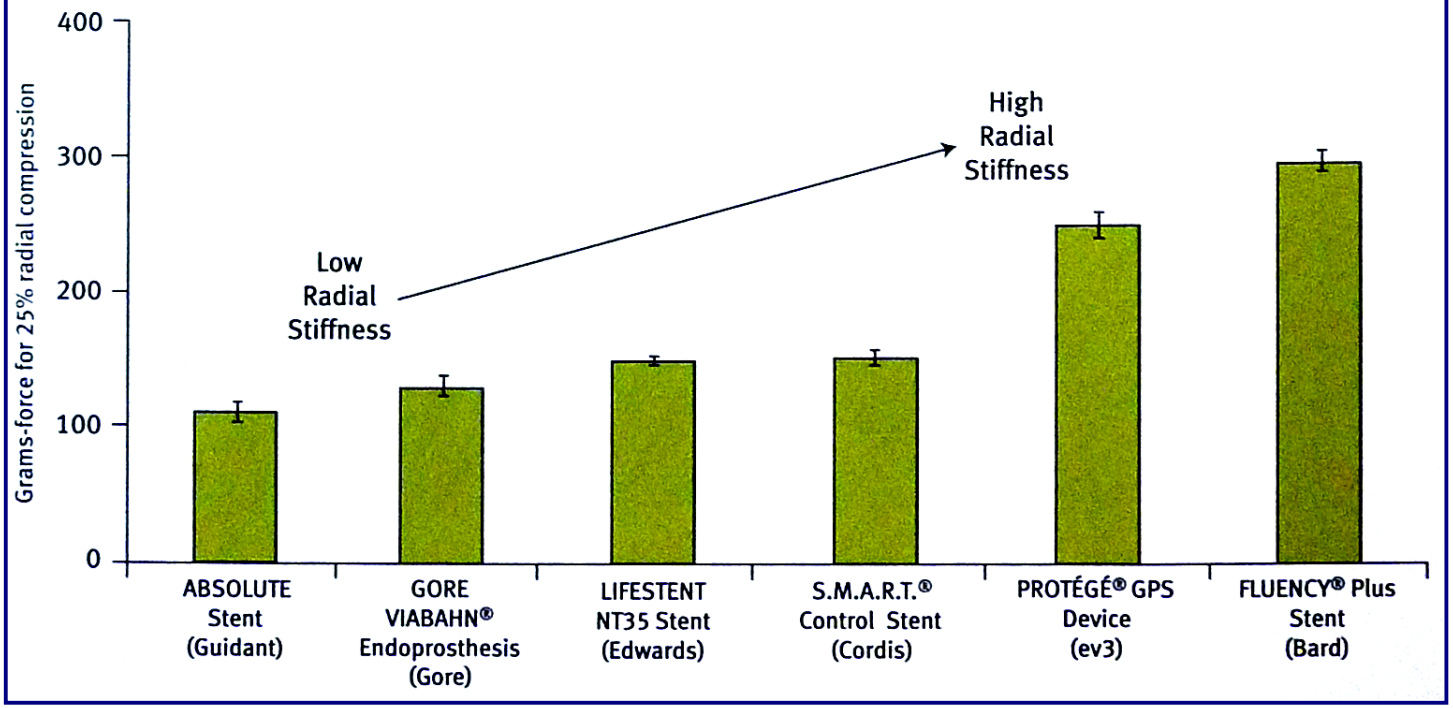
1

SURGICAL DEBRANCHING	18	50%
– RCCA-LCCA-LSA	6	
– RCCA-LCCA	2	
– LCCA-LSA	10	

PARALLEL GRAFT CHOICE

flexibility ≈ radial force

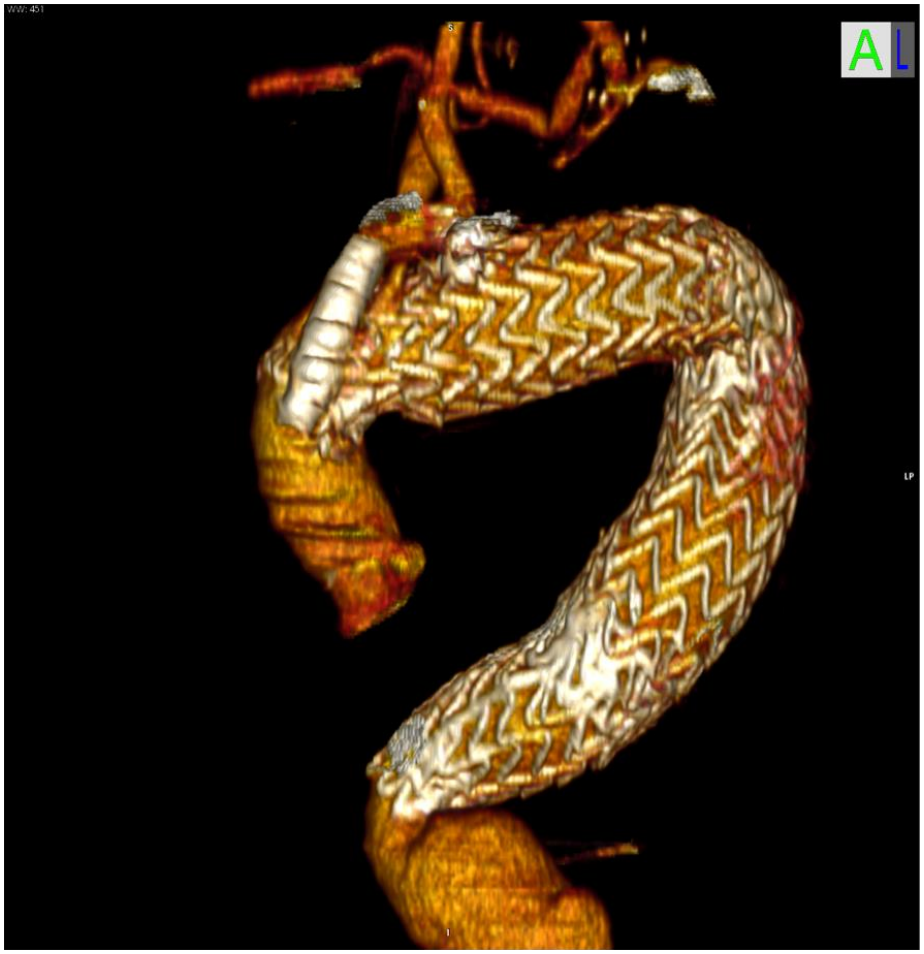
FIGURE 8. Force (grams-force) required to compress stent radially by 25%.

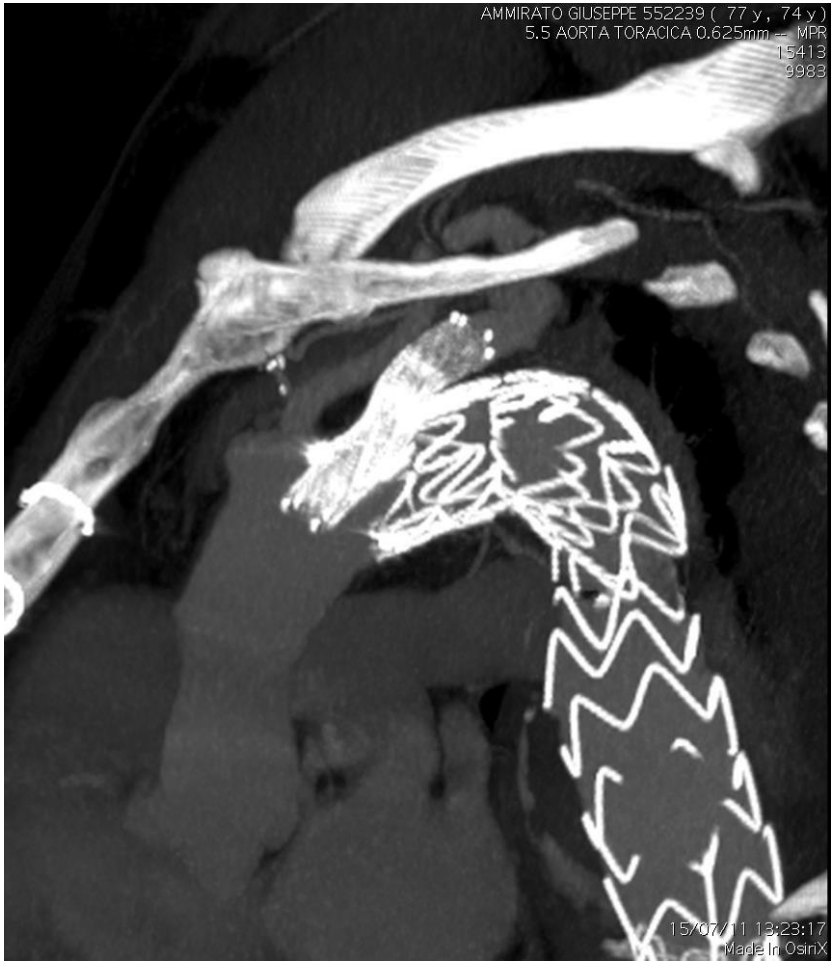


LENGHT/DIAMETER & MATERIAL FATIGUE

REINFORCE THE PARALLEL GRAFT!!
ESPECIALLY IF LONG

REINFORCE THE PARALLEL GRAFT!!
WHEN IS THE ONLY FEEDING VESSEL



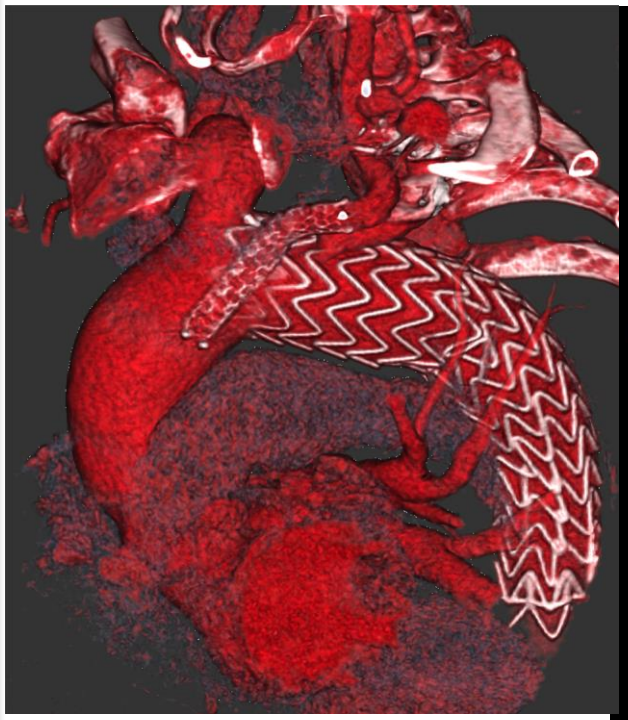


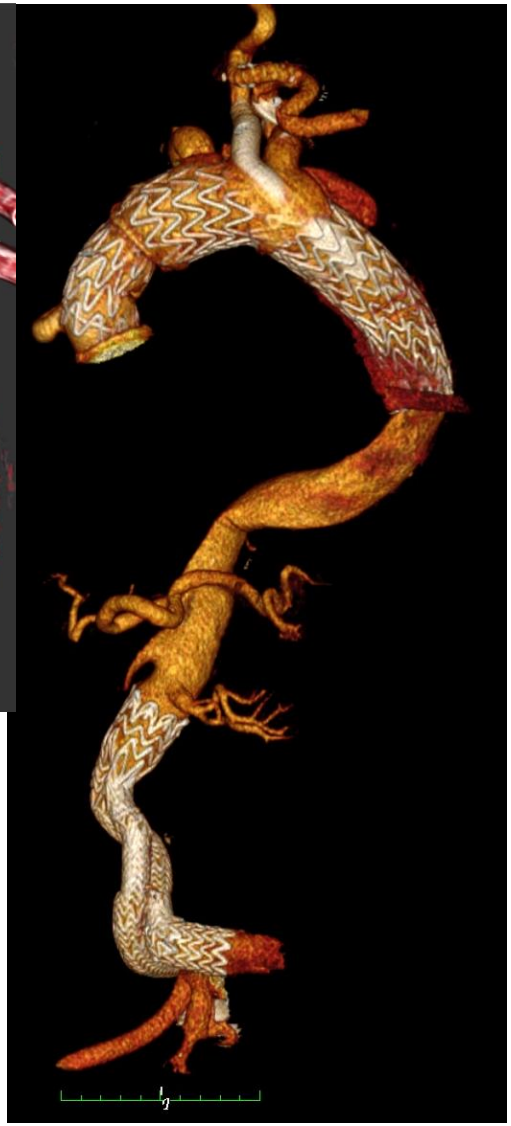
CHIMNEY GRAFT

(OUR EXPERIENCE)

– VIABAHN	28 (15 REINF)
– GORE LEG	3 (1 REINF)
– ADVANTA	1 (REINF)
– WALLSTENT	2
– BIOTRONIK	2
– PROTEGE’	4
– VISI-PRO	1

CHIMNEY ORIENTATION



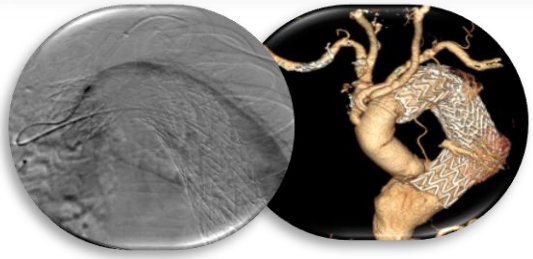


VESSELS
TAKE-OFF

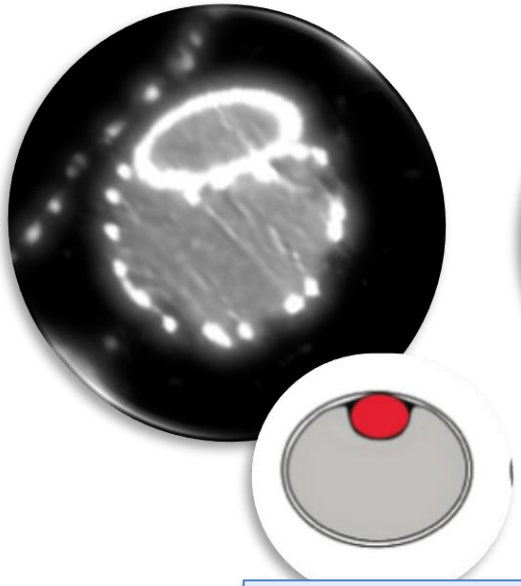
REDUCE INTERACTION
IN THE ASCENDING

GUTTERS

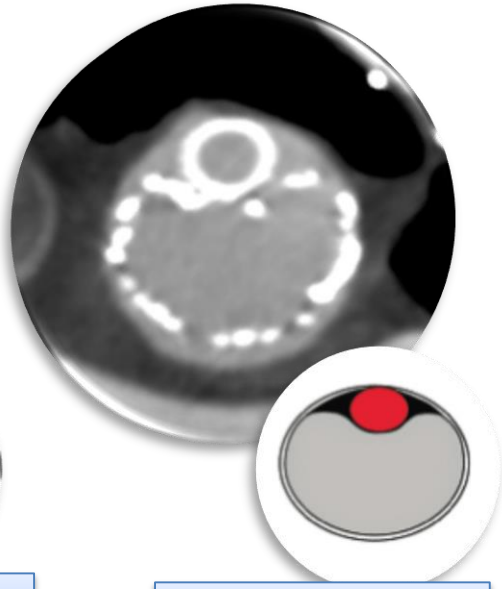
LATE TYPE I EL



“GUTTERS”



minor



major

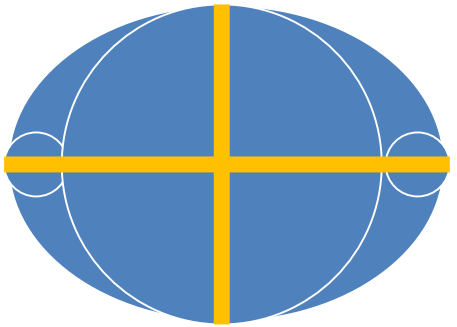
Aortic graft Oversizing options

1. 20%
2. 30%
3. 30% for 2 vessels
   40% for 3 vessels
4. $0{,}72\ \sqrt{a^2 + b^2}$

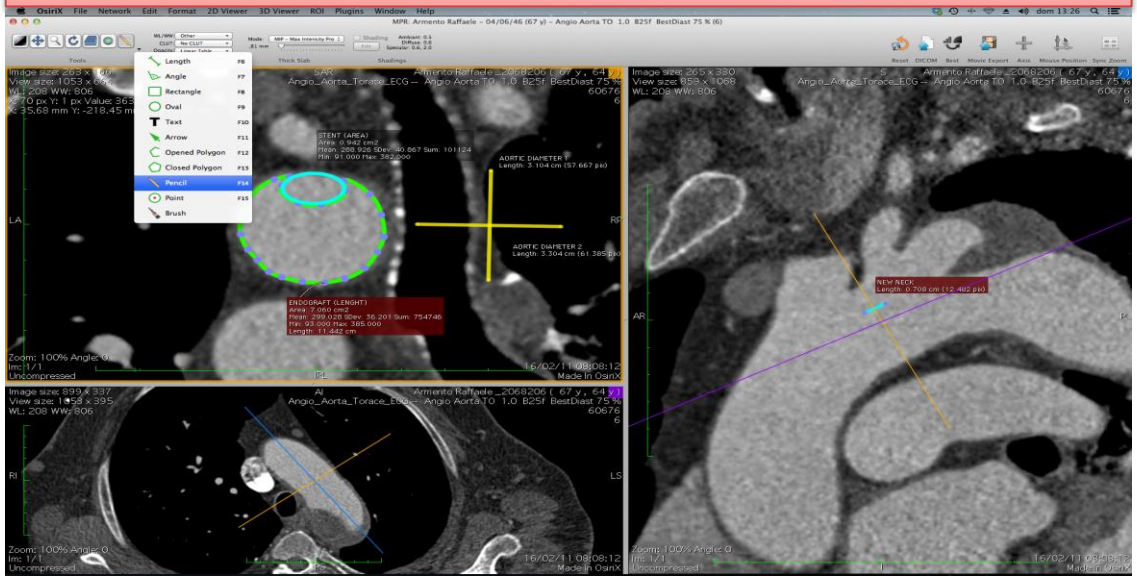
Aortic graft Oversizing options

4. $0{,}72\sqrt{a^2 + b^2}$ (Lachat)

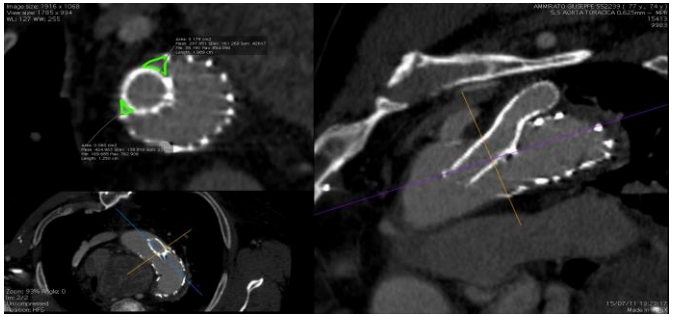
Oversizing 25-35%
for double chimney
Lower for larger diameter



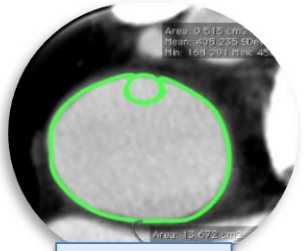
OSIRIX EVALUATION



GUTTERS AREA

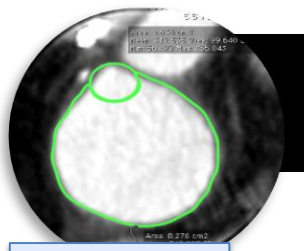


Oversizing & OSIRIX



A: STENT 8 mm

B: STENT 11 mm

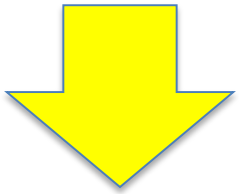


C: STENT 9 mm (ostio dei TSA)

GUTTERS

CHIMNEY OVERLAPPING → HOW LONG?

- Longer chimney → reduce EL (gutters)

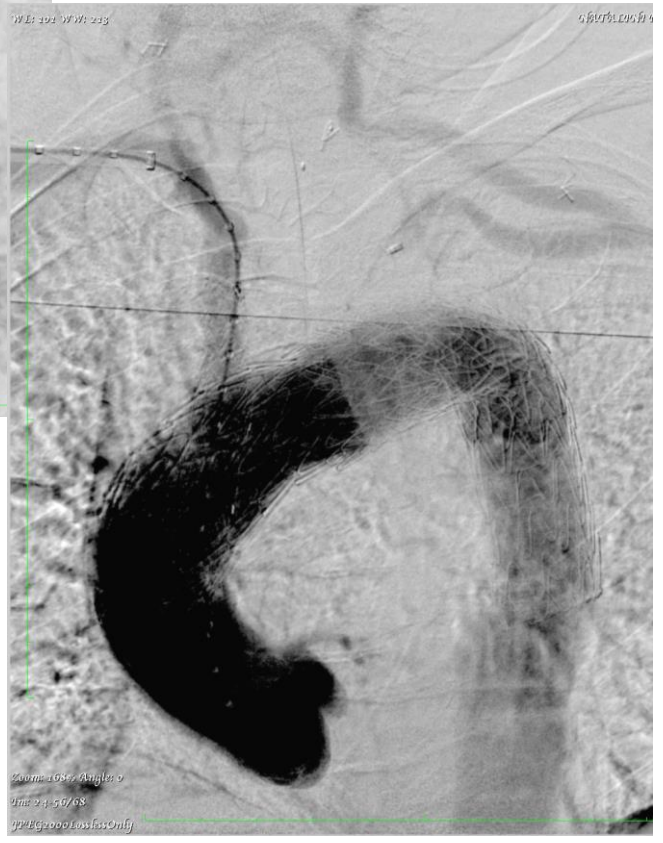


- Bad landing zone → curvature/graft LZ


WL: 127 WW: 255
SFR
Zoom: 100% Angle: 0
Im: 2/2

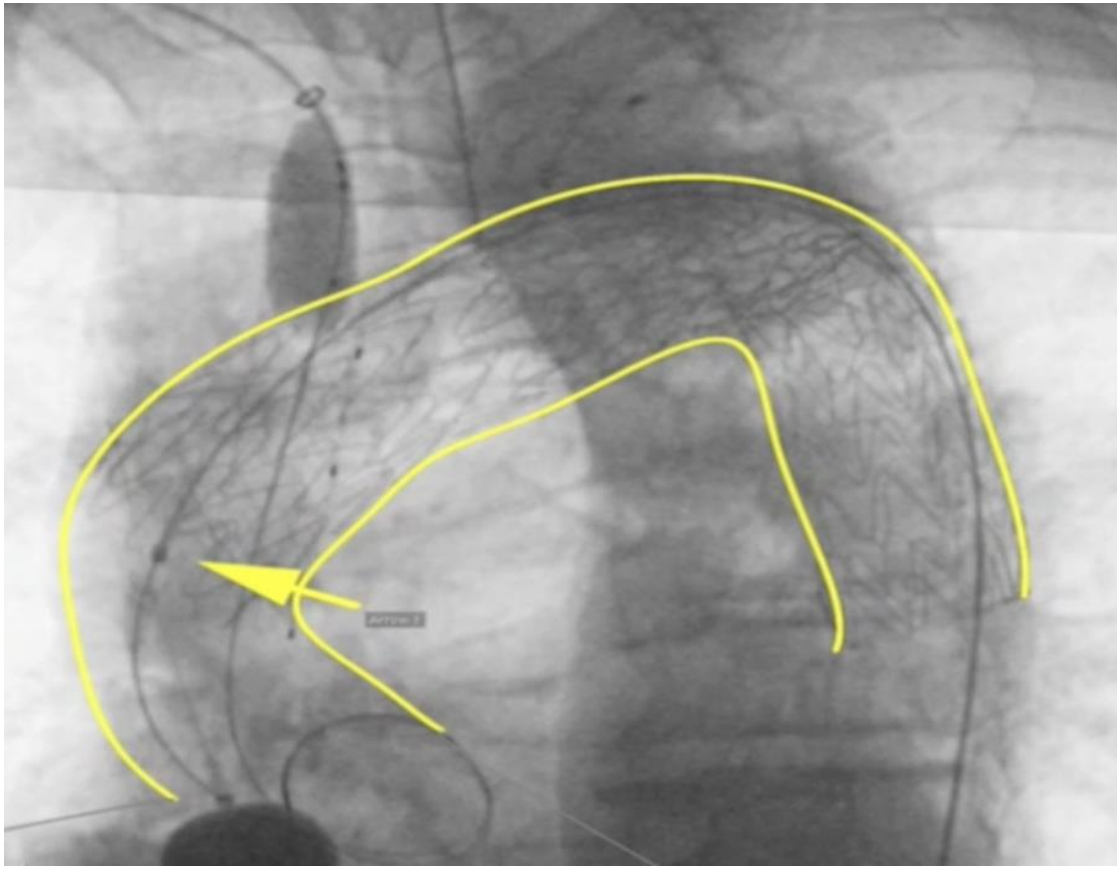

WW: 209


WW: 293
Angle: 0


WL: 102 WW: 213
Zoom: 168% Angle: 0
Im: 24/68
JPEG2000LossOnly

RETROGRADE TYPE A

Day 4 sudden death



FOLLOW-UP

- TYPE I EL
- CHIMNEY GRAFT COMPLICATION

FOLLOW-UP

TYPE I ENDOLEAK 6 (18,2%)

MEAN F-UP 39.6 MTHS (MIN 1-144)

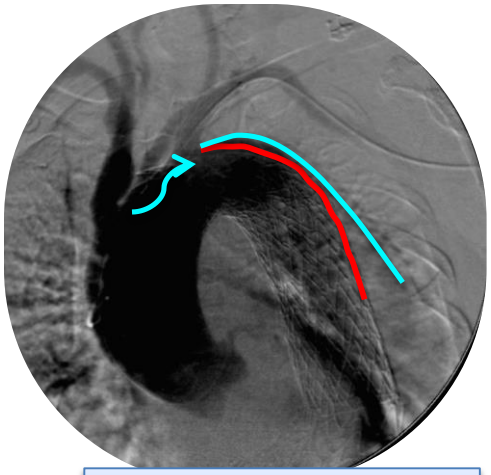
- Ia 5
  - Sac enlargement 2 (IA 6 mths - LSA 10 mths)

    (2 embolization + 1ascending replacement)
  - w/out sac enlargement 3 (LCCA)(IA)(LCCA+LSA)

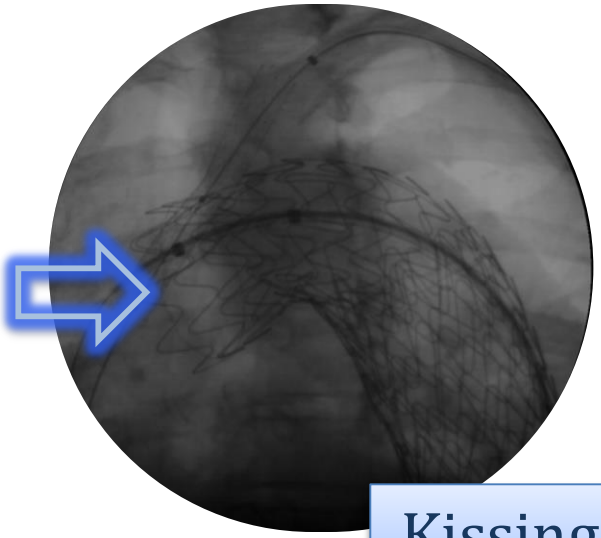
    (91 yrs / lung K →death / COPD & tracheostomy)
- Ib 1 (47 mths)

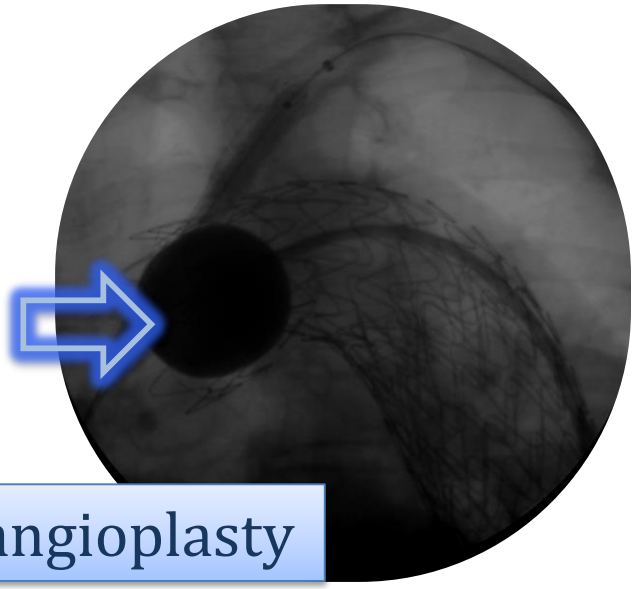
  (distal extension)

ENDOLEAK: GUTTERS EMB/

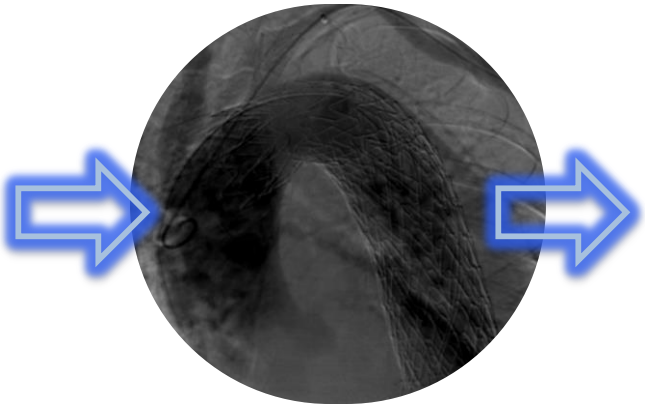


I Type EL

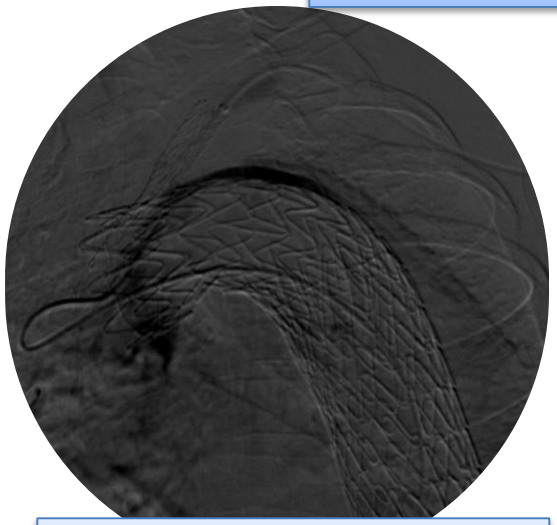




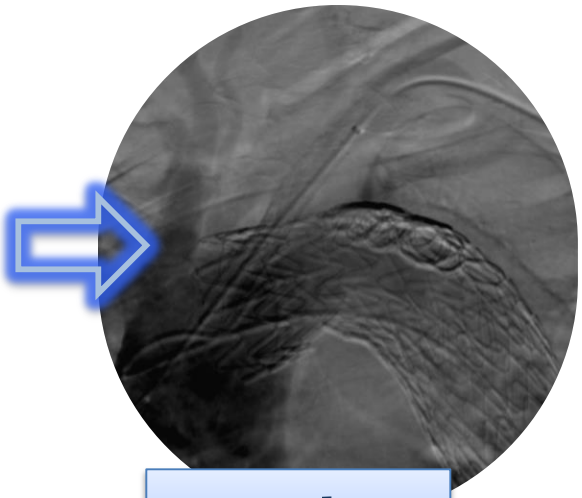
Kissing angioplasty



I Type EL



Gutter select cat



Coils

FOLLOW-UP

CHIMNEY GRAFT COMPLIC. 4 (12.1%)

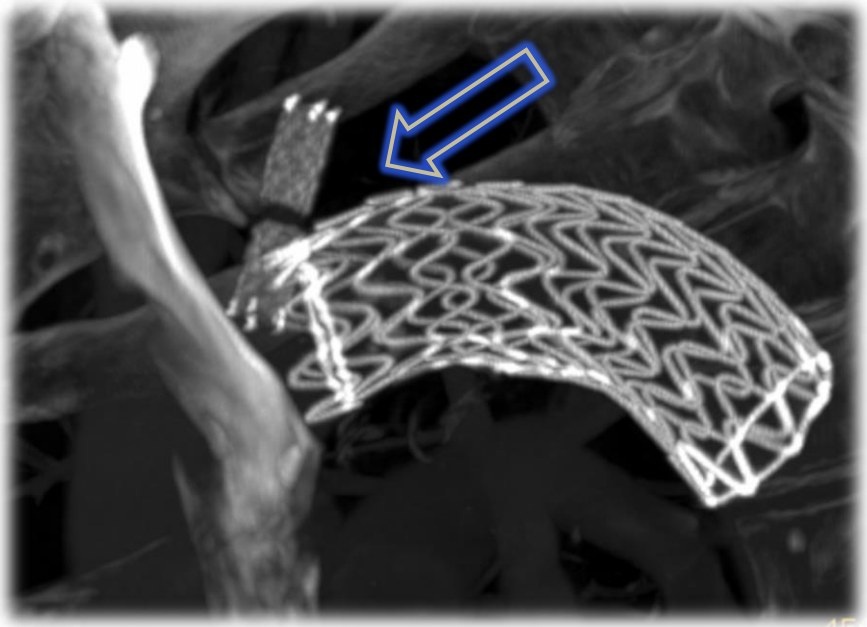
MEAN F-UP 39.6 MTHS (MIN 1-144)

- LSA ASYMPT OCCL — 1 (11 MTHS)
- LCCA ASYMPT OCCL (TREATED → BYPASS) — 1 (22 MTHS)

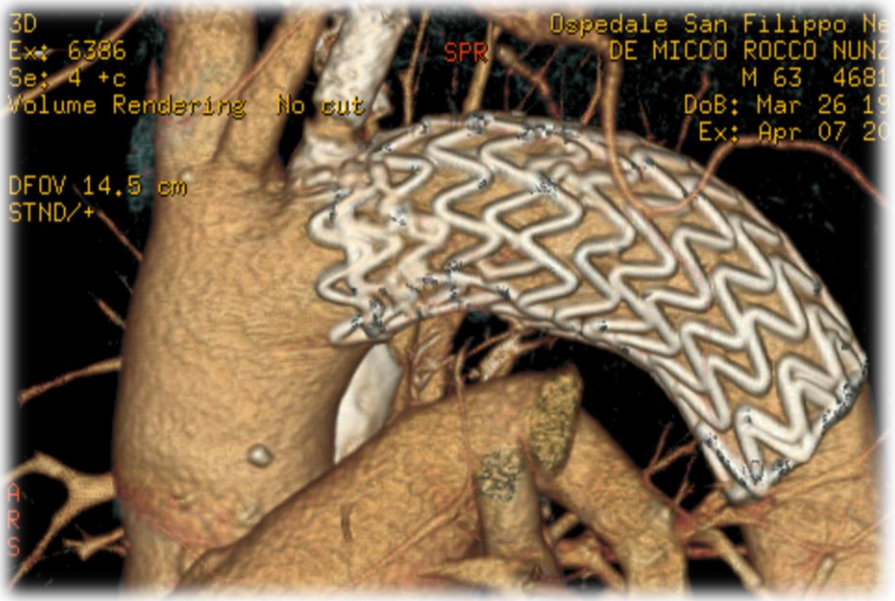
- STENT FRACTURE (ASYMPT) — 1 (2 MTHS)
- VIABAHN STENOSIS — 1 (24 MTHS)

STENT FRACTURE

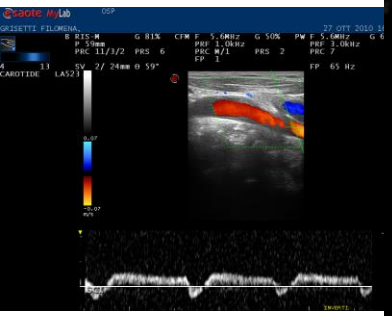
LSA Stent Fracture after 2 months

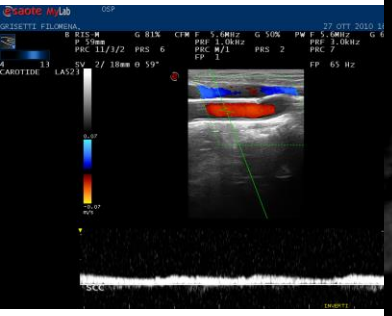


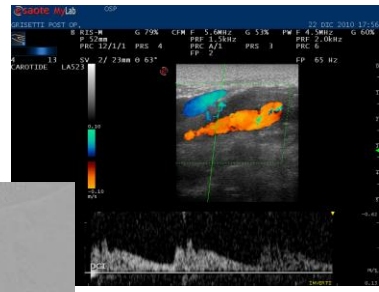
PATENT AT 54 mths

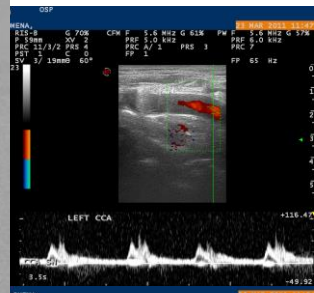


VIABAHN STENOSIS

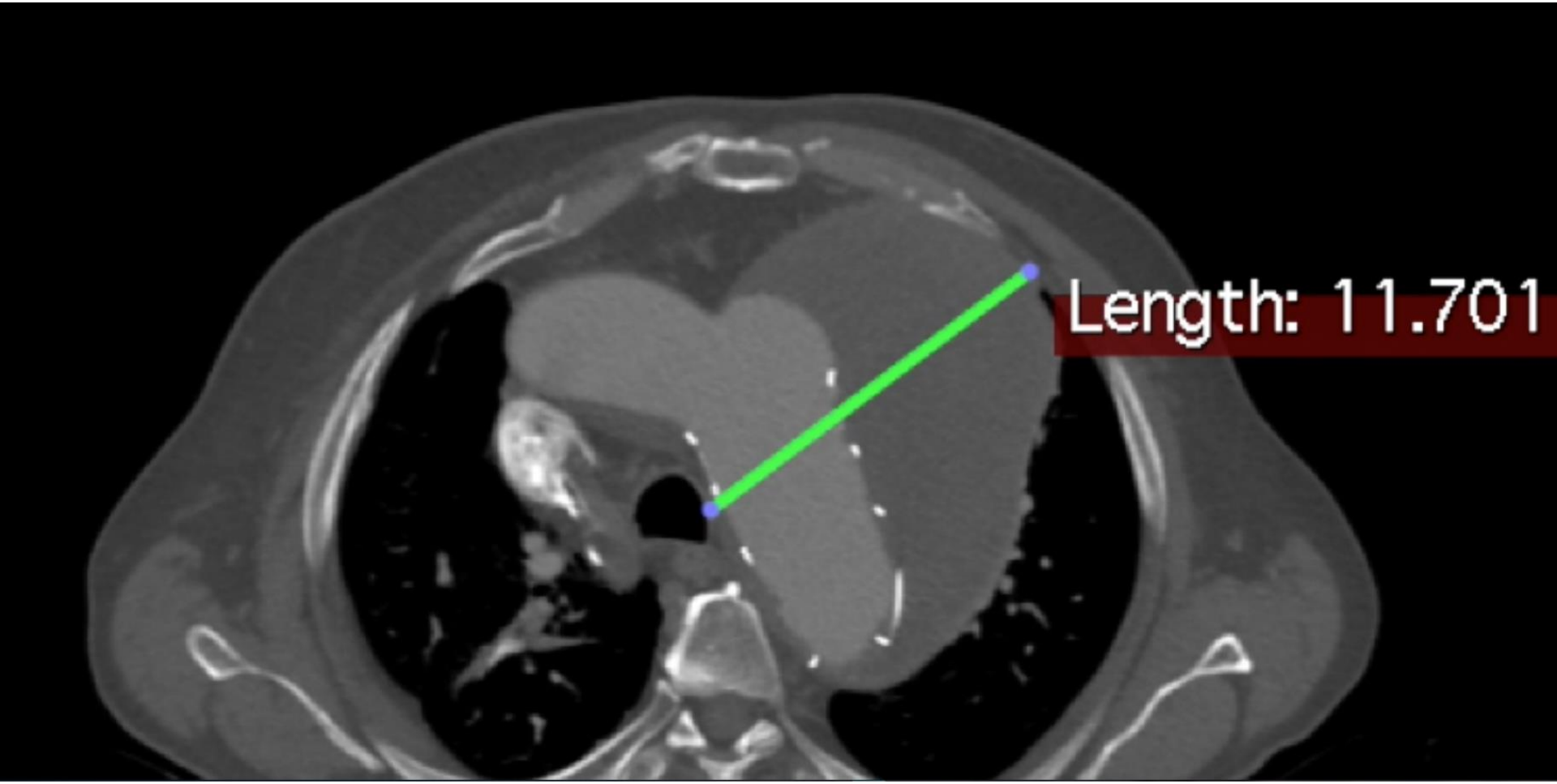








TAA – PREV TEVAR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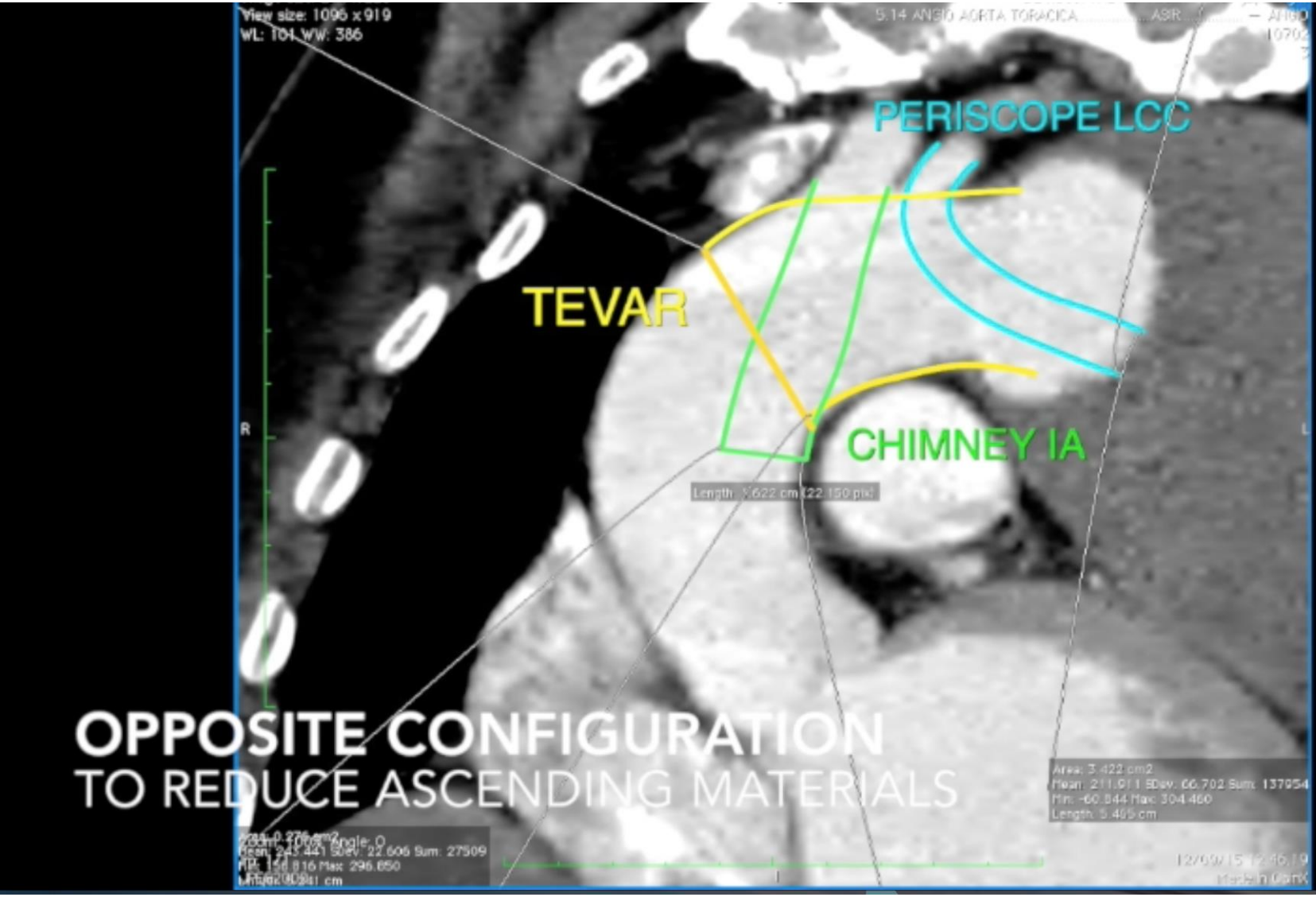
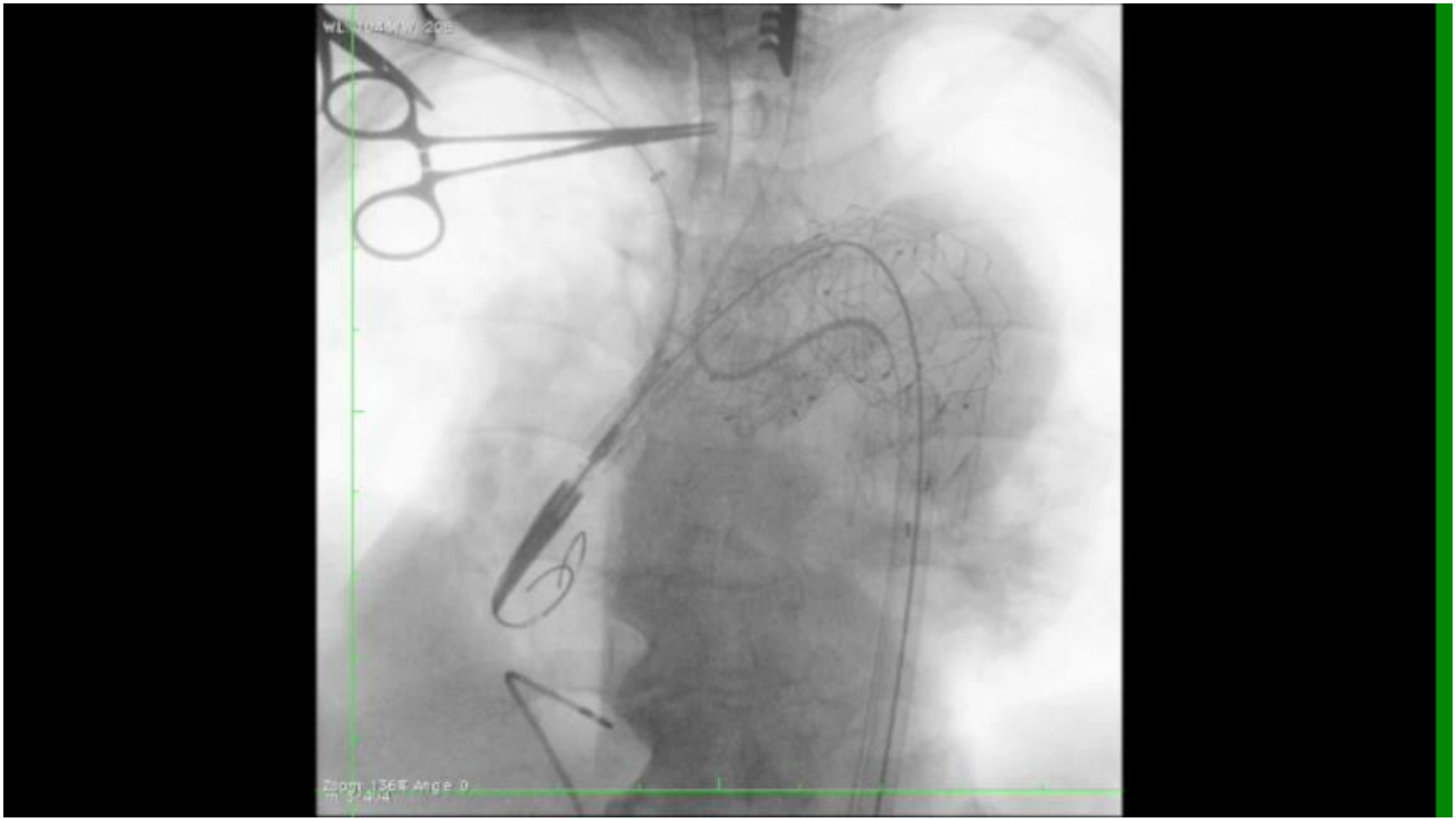
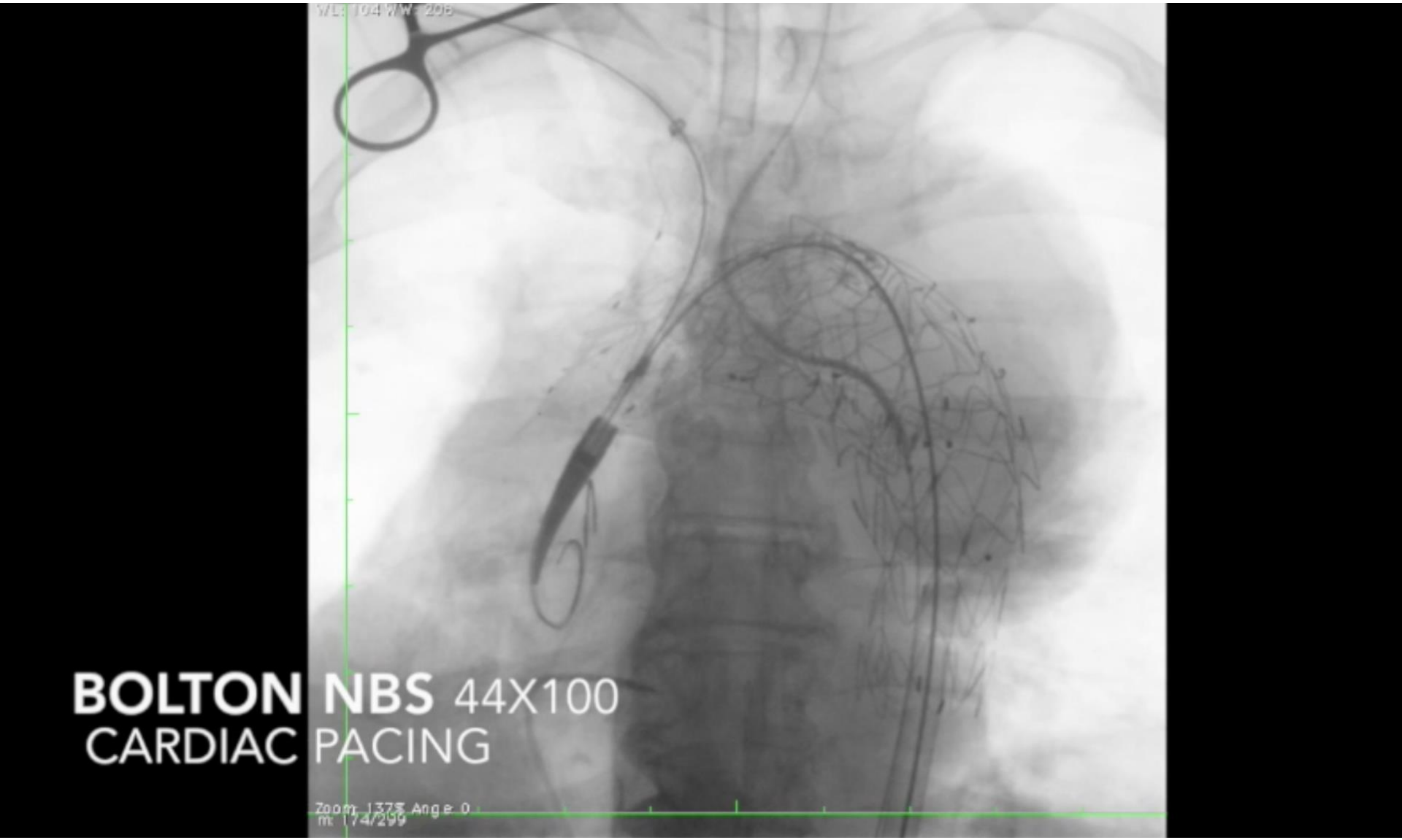
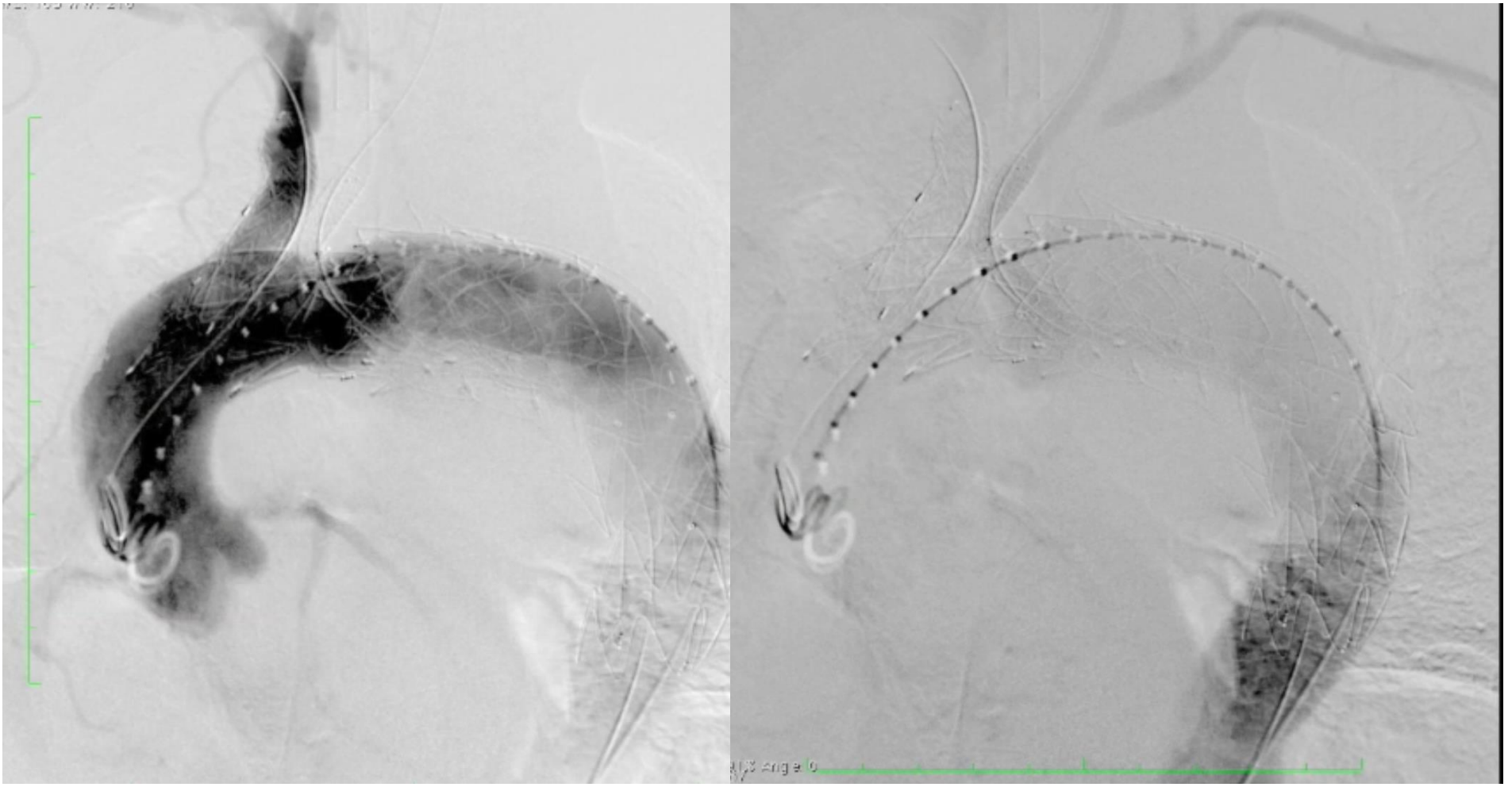

View size: 1096 x 919
WL: 104 WW: 386
PERISCOPE LCC
TEVAR
CHIMNEY IA
OPPOSITE CONFIGURATION
TO REDUCE ASCENDING MATERIALS




WL: 104 WW: 206
BOLTON NBS 44X100
CARDIAC PACING
Zoom 137% Angle 0
Im 174/299




WL: 127 WW: 255
A
Zoom: 67% Angle: 0
mt 2740

CHIMNEYS

- OFF THE SHELF
- FEASIBLE
- SAFE

- DURABLE

CHIMNEY ROLE

- ✓RESCUE
- ✓EMERGENCY
- ✓HIGH RISK PATIENTS
- ✓CUSTOM SG LIMITATION

J CARDIOVASC SURG 2015;56:503-11

Value and limitations of chimney grafts to treat arch lesions

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V. ALBERTI [1], V. ARDITA [1], M. ORRICO [1], M. LACHAT [3]

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[3]*Clinic for Cardiovascular Surgery, University Hospital Zurich, Zurich, Switzerland*

Aim. **The endovascular debranching with chimney stents provides a minimally invasive alternative to open surgery with readily available devices and has extended the option of endoluminal therapy into the realm of the aortic arch. But a critical observation at the use of this technique at the aortic arch is important and necessary because of the lack of long-term results and long term patency of the stents. Our study aims to review the results of chimney grafts to treat arch lesions.**

Methods. **A systematic health database search was performed in December 2014 according to the Prisma Guidelines. Papers were sought through a meticulous search of the MEDLINE database (National Library of Medicine, Bethesda, MA) using the Pubmed search engine.**

Results. **Twenty-two articles were eligible for detailed analysis and data extraction. A total of 182 patients underwent chimney techniques during TEVAR (Thoracic Endovascular Aneurysm Repair). A total of 217 chimney grafts were implanted: 36 to the IA, 1 to the RCCA, 91 to the LCCA and 89 to the LSA. The type of stent-graft used for TEVAR was described in 132 patients. The type and name of chimney graft was described in 126 patients. In 53 patients information was limited to the type. Primary technical success, defined as a complete chimney procedure was achieved in 171 patients (98%). In 8 patients it was not clearly reported. The overall stroke rate was 5.3%. The overall endoleak rate, in those papers were it was clearly reported, was 18.4% (31 patients); 23(13,6%) patients developed a type IA endoleak, 1 patient (0.6%) developed type IB endoleak and 7 patients (4.1%) developed a type II endoleak**

Conclusion. **The total endovascular aortic arch debranching technique represent a good option to treat high-risk patients, because it dramatically reduces the aggressiveness of the procedure in the arch. Many concerns are still present, mainly related to durability and material interaction during time. Long-term follow-up is exceptionally important in light of the interactions of the stents, the thoracic endograft, the aortic arch, and every variation in systolic and diastolic pressure. Actually this technique has acceptable short and mid-term results. Long term data are available just from a very small number of patients and more data from a wider number are needed in order to embrace this method as a safe one.**

KEY WORDS: Aortic arch syndromes - Endovascular procedures - Surgical procedures, operative.

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Thoracic endovascular aortic repair (TEVAR) has been established as the preferential therapeutical modality for the treatment of intact aneurysms of the descending thoracic aorta.[1, 2] Its application has also gained a wide acceptance for the treatment of acute thoracic aortic pathologies[3,4]. Aortic arch repair is a challenge for cardiac and vascular surgeons. Open surgical arch replacement can be performed safely[5] but it still represents a high-risk procedure with increased morbidity and mortality [6] in fragile patients. The current choice of treatment is open graft replacement, but approximately 20% of patients are considered unfit for open surgery.[7] In these patients, deemed to be at higher risk, other