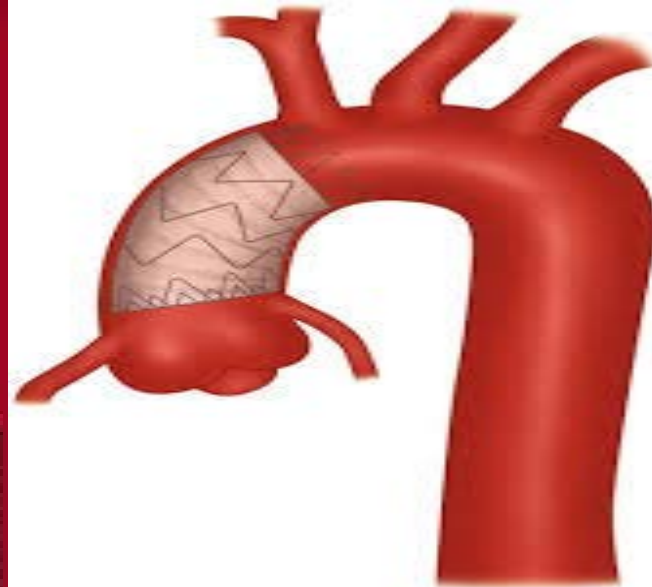




ΕΝΩΣΗ ΕΠΙΣΤΗΜΟΝΙΚΟΥ ΠΡΟΣΩΠΙΚΟΥ
Γ.Ν.Α. «Ο ΕΥΑΓΓΕΛΙΣΜΟΣ» (Ε.Ε.Π.Ν.Ε.)

25ο ΕΤΗΣΙΟ ΣΕΜΙΝΑΡΙΟ
ΣΥΝΕΧΙΖΟΜΕΝΗΣ
ΙΑΤΡΙΚΗΣ ΕΚΠΑΙΔΕΥΣΗΣ
Γ.Ν.Α. «Ο ΕΥΑΓΓΕΛΙΣΜΟΣ»



ΓΕΝΙΚΟ ΝΟΣΟΚΟΜΕΙΟ ΑΘΗΝΩΝ
"Ο ΕΥΑΓΓΕΛΙΣΜΟΣ"

στην υπηρεσία του ανθρώπου από το 1884

ΕΝΔΟΑΥΛΙΚΗ ΑΝΤΙΜΕΤΩΠΙΣΗ ΤΗΣ

ΑΝΙΟΥΣΗΣ ΑΟΡΤΗΣ

ΣΑΜΙΩΤΗΣ ΗΛΙΑΣ MD, MSc



ΕΝΩΣΗ ΕΠΙΣΤΗΜΟΝΙΚΟΥ ΠΡΟΣΩΠΙΚΟΥ
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25^ο

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Δεν υπάρχει σύγκρουση συμφερόντων με τις Χορηγούς Εταιρείες:



NOVEMBER 2011 | ENDOVASCULAR TODAY

Coming Soon: TEVAR in the Ascending Aorta?

The emergence of endovascular therapy
in this challenging anatomy as an alternative to open repair.

BY MATT THOMPSON, MD, FRCS

Technical Challenges in the Ascending Aorta

- **Access vessels** will be narrow and tortuous, which may make delivery of the endograft problematic
- *The endograft* need to be positioned in the left ventricle, with the attendant risk of valve disruption and ventricular perforation

Technical Challenges in the Ascending Aorta

- Need to use a *delivery system* that accommodates deployment into curved anatomy
- The *proximal landing zone* will be necessarily close to the aortic valve and coronary arteries, whereas the **distal zone** will be in proximity to the innominate ostium

Technical Challenges in the Ascending Aorta

- **Deployment** of the endograft will need to take into consideration the hemodynamic forces in the ascending aorta
- **Fragility of the ascending aorta** may pose difficulties, with the potential of retrograde type A dissection

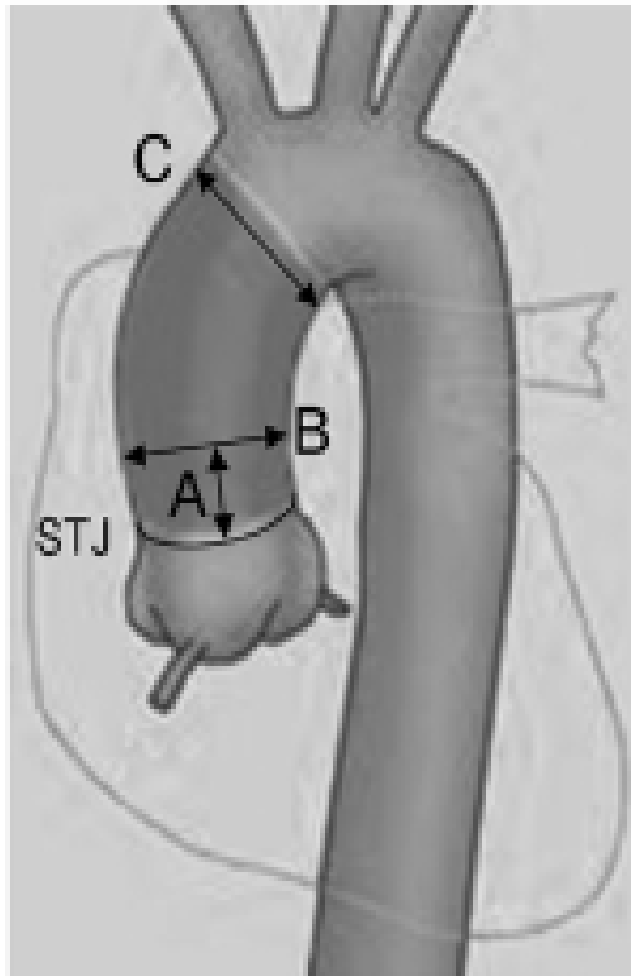


Table 1

Proposed anatomical suitability criteria for endovascular treatment of TAAD.

Entry tear distal to sinotubular junction

Proximal and distal landing zone length >20 mm

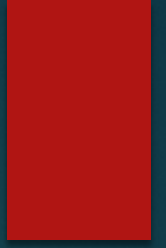
Proximal landing zone diameter <38 mm

No aortic valve involvement

Absence of coronary grafts originating from ascending aorta

Adequate iliofemoral access vessels [24Fr]

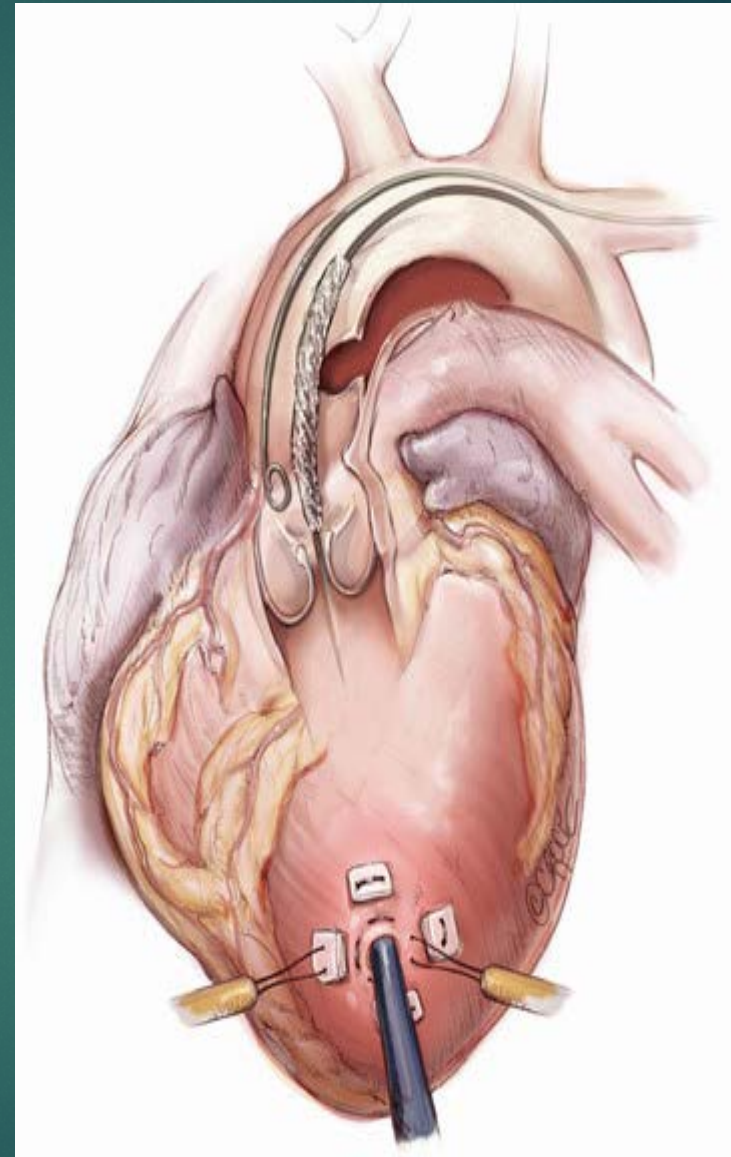
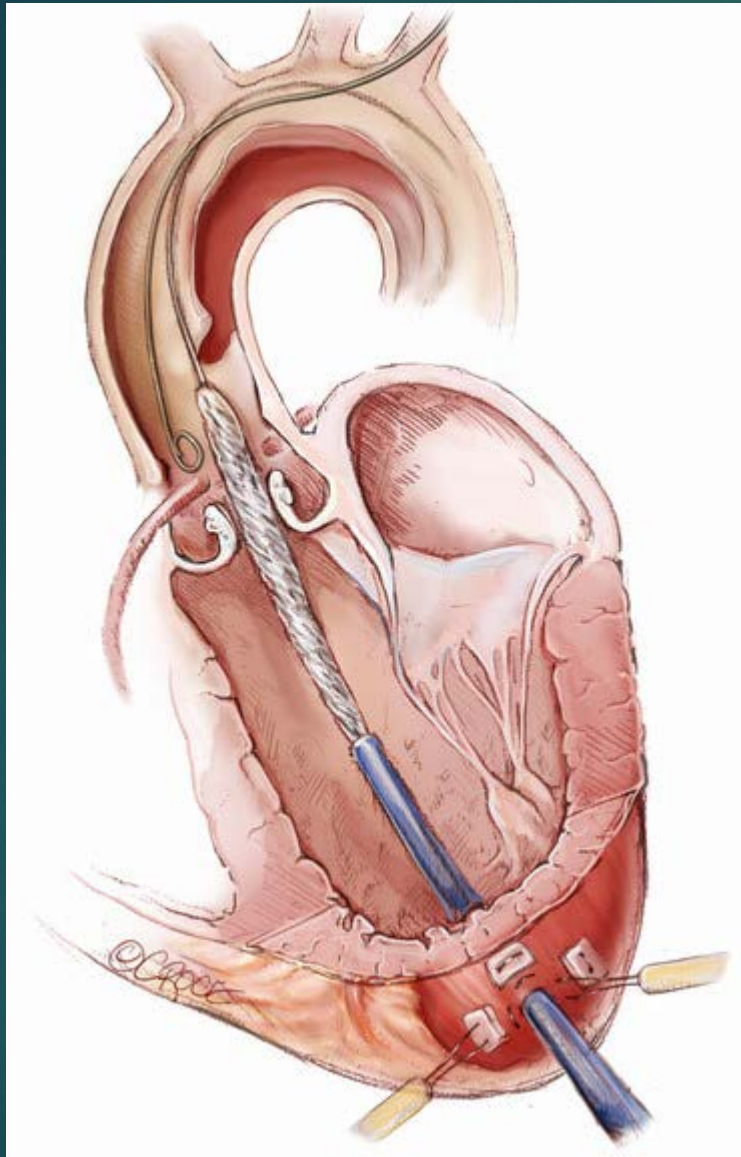
Anatomic Restrictions



- 1) **Landing zone** of at least 2 cm (0,5-1cm)
- 2) **Aortic diameter** <38/40 mm and >23 mm
- 3) Use the **length along the greater curve** to predict the adequate length needed ($L > 65\text{mm}$)
- 4) **Ascending aorta-specific device designs** = larger-diameter devices with a precurved shape in shorter lengths (on average about 7-9 cm)

Procedure

- **General anesthesia** with **heparin** for anticoagulation (ACT 200-250)
- Device delivery can be **transfemoral**, **transapical**, or through the **axillary artery**
- **Transfemoral delivery** = cut-down exposure of the common femoral artery
- **Transapical delivery** = through and through wire access into the left subclavian artery using a snare technique
- **Axillary artery approach** = 10-mm surgical graft conduit



Systematic review of endovascular repair of ascending aortic dissection.

Zhang L1, Li Z2, Li S1, Zhao Z3, Bao J1, Zhou J1, Jing Z1.

1Department of Vascular Surgery, Changhai Hospital, Navy Medical University, Shanghai, China.

2Vascular Surgery Department, the First Affiliated Hospital of the Medical School of Zhejiang University, Hangzhou, Zhejiang.

3Department of Surgery, Changhai Hospital, Navy Medical University, Shanghai, China .

BACKGROUND: Endovascular repair has been used in selected ascending aortic dissection patients **judged unfit for direct open surgery**. However, the selective criteria and the results of endovascular repair of ascending aortic dissection, and the potential risk factors of adverse events were still obscure. The aim of this study was to summarize the published data linking endovascular therapy for ascending aortic dissection.

METHODS: Studies reporting **endovascular repair of ascending aortic dissections** were identified by searching PubMed and Embase databases in accordance with preferred reporting items for systematic reviews and meta-analyses guidelines, and by reviewing the reference lists of retrieved articles. All available data were pooled and the subgroup analyses were conducted.

Systematic review of endovascular repair of ascending aortic dissection.

Zhang L1, Li Z2, Li S1, Zhao Z3, Bao J1, Zhou J1, Jing Z1.

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3Department of Surgery, Changhai Hospital, Navy Medical University, Shanghai, China.

RESULTS: A total of nine studies were identified according to the inclusion criteria. The **overall technical success was 91.7%**. The mean period of follow-up was 34.7 months. The **early mortality within 30 days** and **late mortality** during the follow-up were **10.3%** and **19.0%**, respectively. The incidence of **endoleak was 14.3%**. In the subgroup analysis, we found that **female** and **oversizing >10%** were **risk factors of adverse events**.

CONCLUSIONS: The pooled results suggested that endovascular repair of ascending aortic dissection **was feasible, promising, and inspiring**. The selection of endovascular therapy should be **cautious based on preoperative evaluation**. Application of **different strategies for different ascending lesions** should be considered. The dedicated endograft for ascending aorta is desperately needed before broader application of endovascular repair for ascending aortic pathologies can be achieved.

Endovascular Repair of Ascending Aortic Disease **in High-Risk** Patients Yields Favorable Outcome (Commentary).

Schaffer JM, Brinkman WT.

Ann Thorac Surg. 2019 Sep 28.

Enlargement rate of the ascending aorta after thoracic endovascular aortic repair **in High-Risk** Patients .

Hiraoka T, Komiya T, Shimamoto T.

Semin Thorac Cardiovasc Surg. 2019 Sep

Endovascular treatment of acute type A aortic dissection **in High-Risk** Patients : stabilization of a short covered stent using a bare-metal stent.

Wamala I, Heck R, Falk V, Buz S.

Interact Cardiovasc Thorac Surg. 2019 Aug

Experience of stent-graft repair in acute ascending aortic syndromes.

Hsieh YK, Lee CH.

J Card Surg. 2019 Oct;34

The first endovascular repair of an acute type A dissection using an endograft designed for the ascending aorta.

Metcalfe MJ¹, Karthikesalingam A, Black SA, Loftus IM, Morgan R, Thompson MM.

Author information

¹St George's Vascular Institute, St George's Healthcare NHS Trust, London, United Kingdom. matt.thompson@stgeorges.nhs.uk



Fig 2. The Zenith Ascending Dissection stent.



arteries. After surgery, the patient was extubated within 24 hours. A CT scan confirmed satisfactory coverage of the intimal tear with no contrast extravasation (Fig 3). The patient made a successful recovery with her renal function returning to normal.

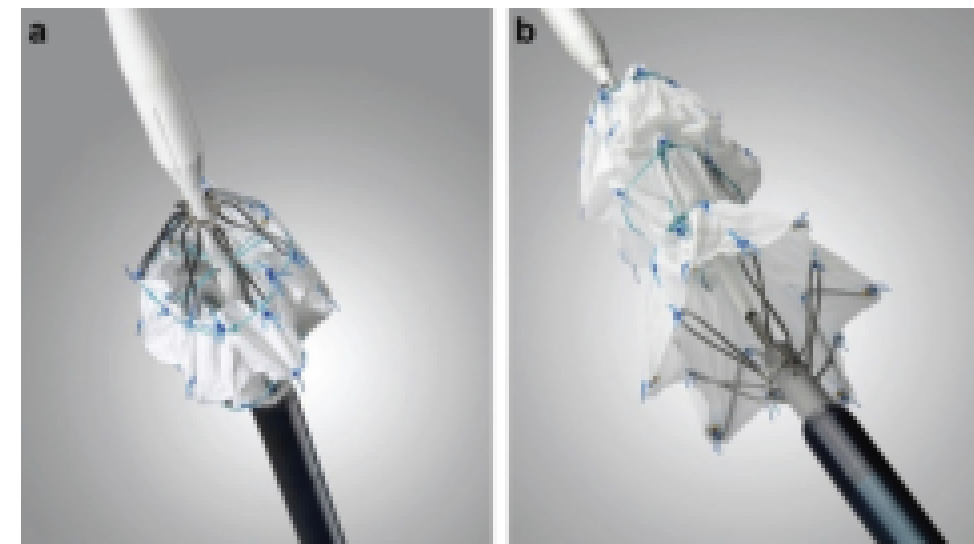
International experience with endovascular therapy of the ascending aorta with a dedicated endograft

Nikolaos Tsilimparis, MD, PhD,^a E. Sebastian Debus, MD, PhD,^a Gustavo S. Oderich, MD,^b Stephan Haulon, MD,^c Kim Allan Terp, MD,^d Blayne Roeder,^e Christian Detter, MD, PhD,^f and Tilo Kölbel, MD, PhD,^a *Hamburg, Germany; Rochester, Minn; Lille, France; Aarhus, Denmark; and Bloomington, Ind*

• Zenith Ascend TAA Endovascular Graft

10 patients:

- **aneurysm** (n = 4)
- **dissection** (n = 5)
- fixation of an intraprocedural **dislocated aortic valve** (n = 1)



(J Vasc Surg 2016;■:1-7.)

International experience with endovascular therapy of the ascending aorta with a dedicated endograft

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- Zenith Ascend TAA Endovascular Graft
 - **Clinical success** in coverage of the lesions = 9/10
 - **Early neurologic events** = 2/10 (1 with stroke and paraplegia and 1 with TIA)
 - 2/10 late reinterventions for **persisting endoleaks**
 - 3/10 **late deaths** occurred, with one treatment related, as a result of graft infection

Endovascular stent grafting for ascending aorta repair in high-risk patients

Eric E. Roselli, MD, Jahanzaib Idrees, MD, Roy K. Greenberg, MD, Douglas R. Johnston, MD, and Bruce W. Lytle, MD

- From 2006 to 2014, 22 patients underwent supracoronary ascending TEVAR for
 - 1) acute Type A dissection (n = 9)
 - 2) intramural hematoma (n = 2)
 - 3) pseudoaneurysm (n = 9)
 - 4) chronic dissection (n = 2)
 - 5) aorta-cardiac fistula (n = 2)

Endovascular stent grafting for ascending aorta repair in high-risk patients

Eric E. Roselli, MD, Jahanzaib Idrees, MD, Roy K. Greenberg, MD, Douglas R. Johnston, MD, and Bruce W. Lytle, MD

- **Devices were delivered via**
 - 1) **transfemoral (n = 10)**
 - 2) **transapical (n = 7)**
 - 3) **axillary (n = 5)**
- **16/22 (73%) = Prior Aortic Surgery**

Endovascular stent grafting for ascending aorta repair in high-risk patients

Eric E. Roselli, MD, Jahanzaib Idrees, MD, Roy K. Greenberg, MD, Douglas R. Johnston, MD, and Bruce W. Lytle, MD

- Two patients (9%) required early conversion to open repair
- One patient-partial occlusion of the left coronary artery/ died later from MOF
- One patient - retained delivery system
- There were 3 hospital deaths (13.6%); 1 was intraoperative

Endovascular stent grafting for ascending aorta repair in high-risk patients

Eric E. Roselli, MD, Jahanzaib Idrees, MD, Roy K. Greenberg, MD, Douglas R. Johnston, MD, and Bruce W. Lytle, MD

- 3 (13.6%) had **stroke**
- 2 (9%) had **myocardial infarction**
- 2 (9%) required **tracheostomy** for respiratory failure
- 1 (4.5%) had **distal migration** of the stent graft into his arch found incidentally during follow-up CT at 6 months

Endovascular stent grafting for ascending aorta repair in high-risk patients

Eric E. Roselli, MD, Jahanzaib Idrees, MD, Roy K. Greenberg, MD, Douglas R. Johnston, MD, and Bruce W. Lytle, MD

- 6 (27%) developed **type 1 endoleak**:
 - 2 were treated endovascularly,
 - 1 with open repair
 - 1 resolved
 - 1 refused treatment
 - 1 is being watched

First-in-Human Endo-Bentall Procedure for Simultaneous Treatment of the Ascending Aorta and Aortic Valve

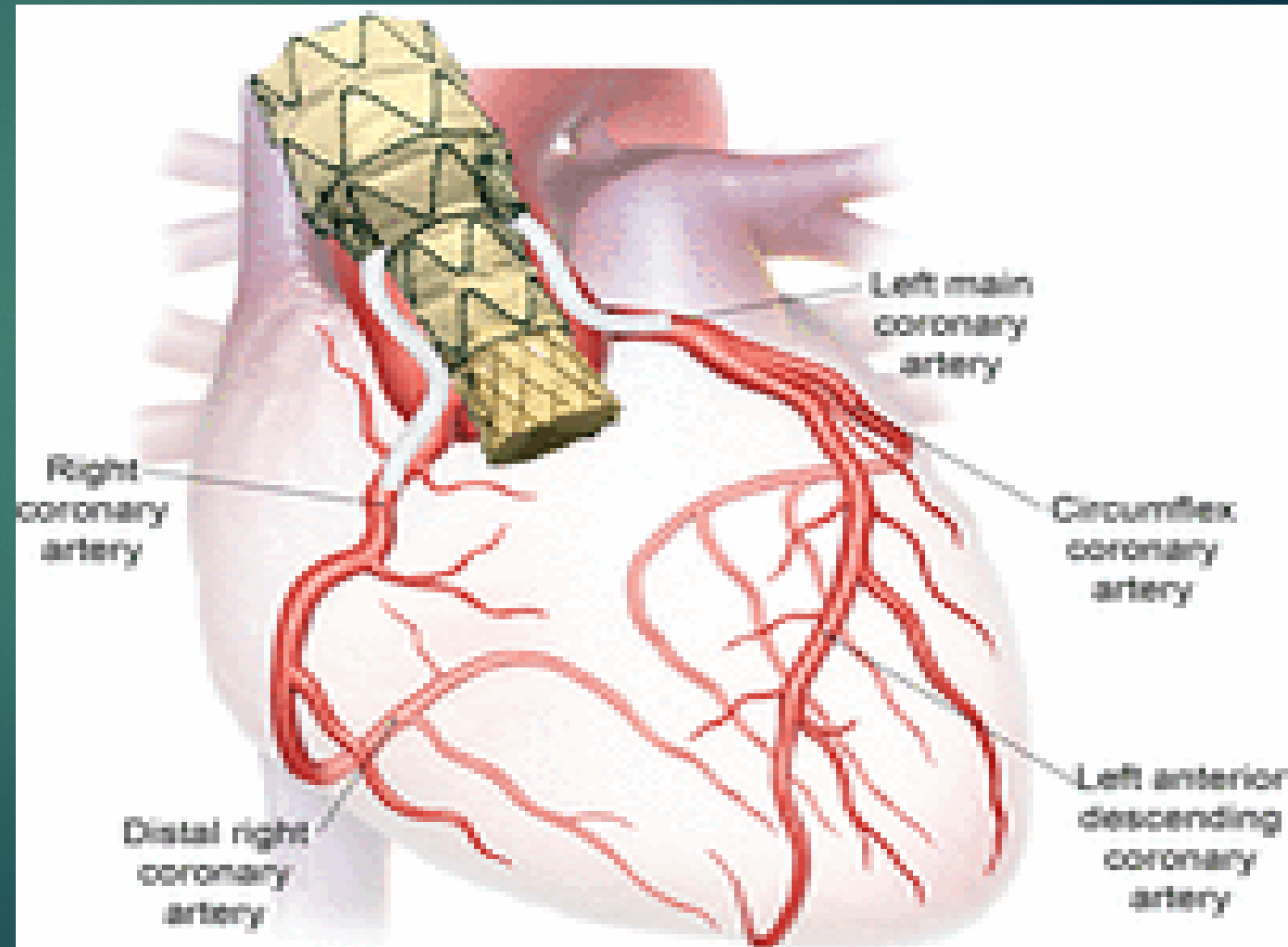
Diego Felipe Gaia, Oscar Bernal, Edilberto Castilho, Carolina Baeta Neves Duarte Ferreira, Danny Dvir, Matheus Simonato and José Honório Palma

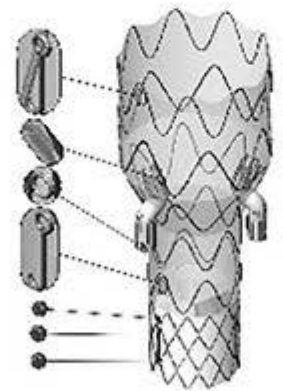
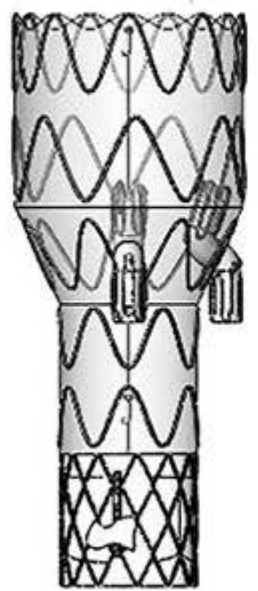
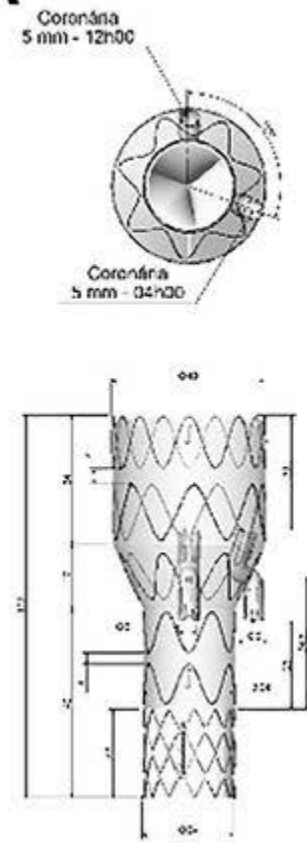


Middle-aged woman

Bleeding suprasternal fistula after conventional aortic valve replacement.

The patient's condition was considered inoperable



A**B**

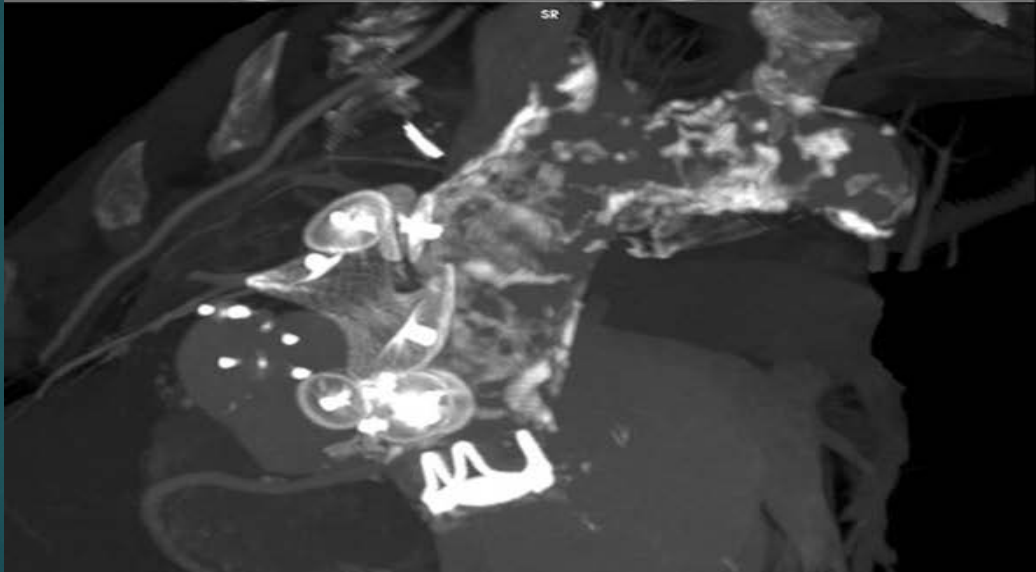
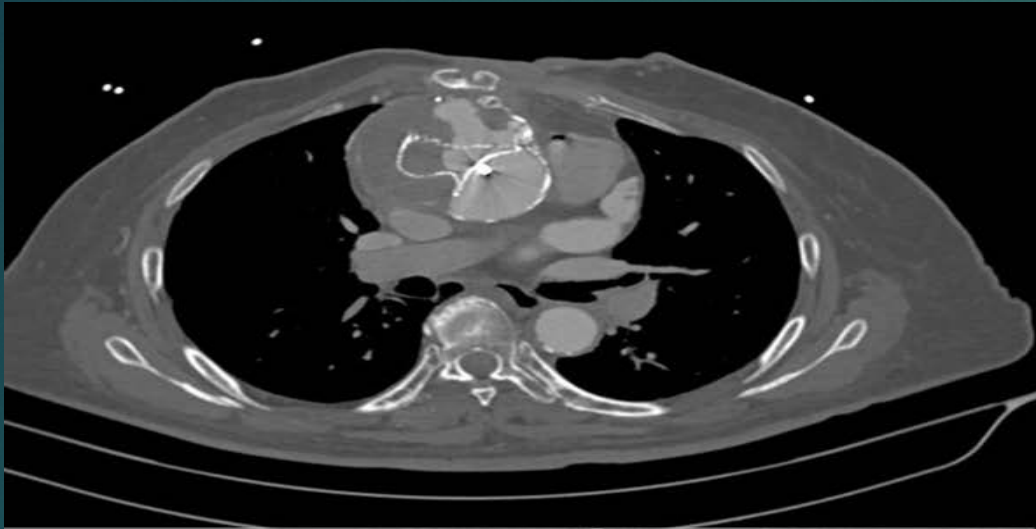
Proseal Sealing®

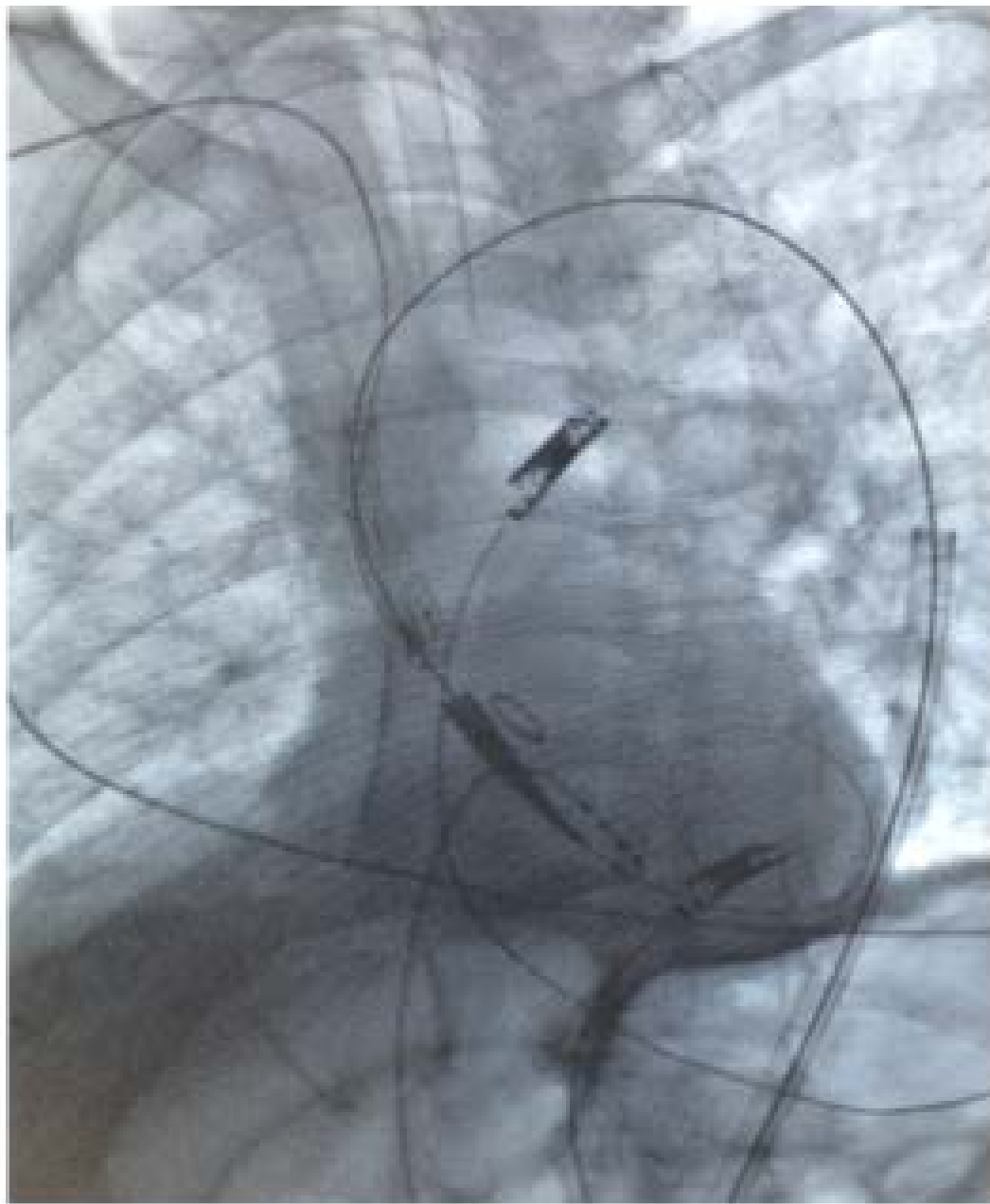
Nitinol Stent Graft (self expandable)

External and internal coronary branches

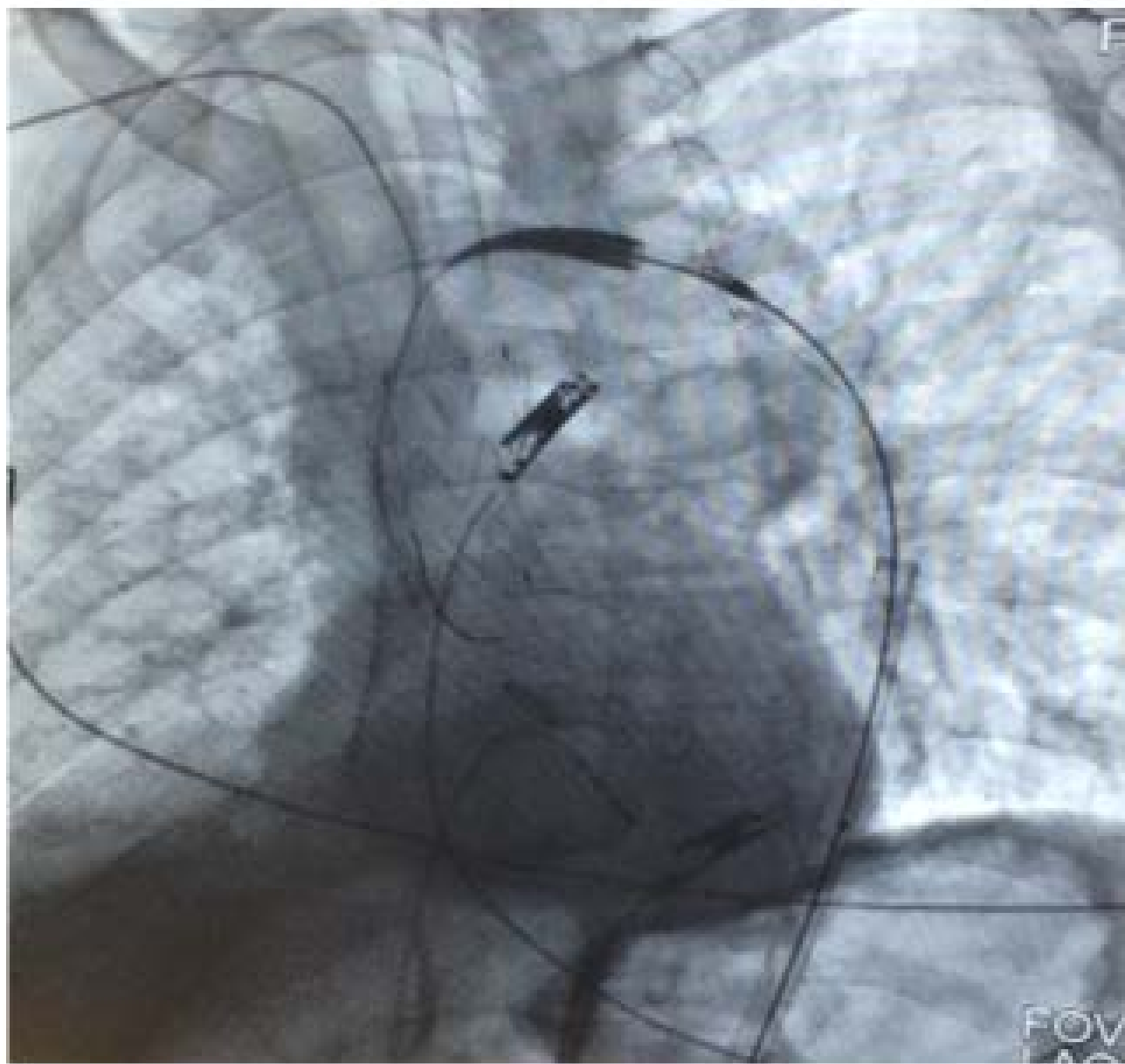
Inovare THV Braile Biomedical (balloon expandable)



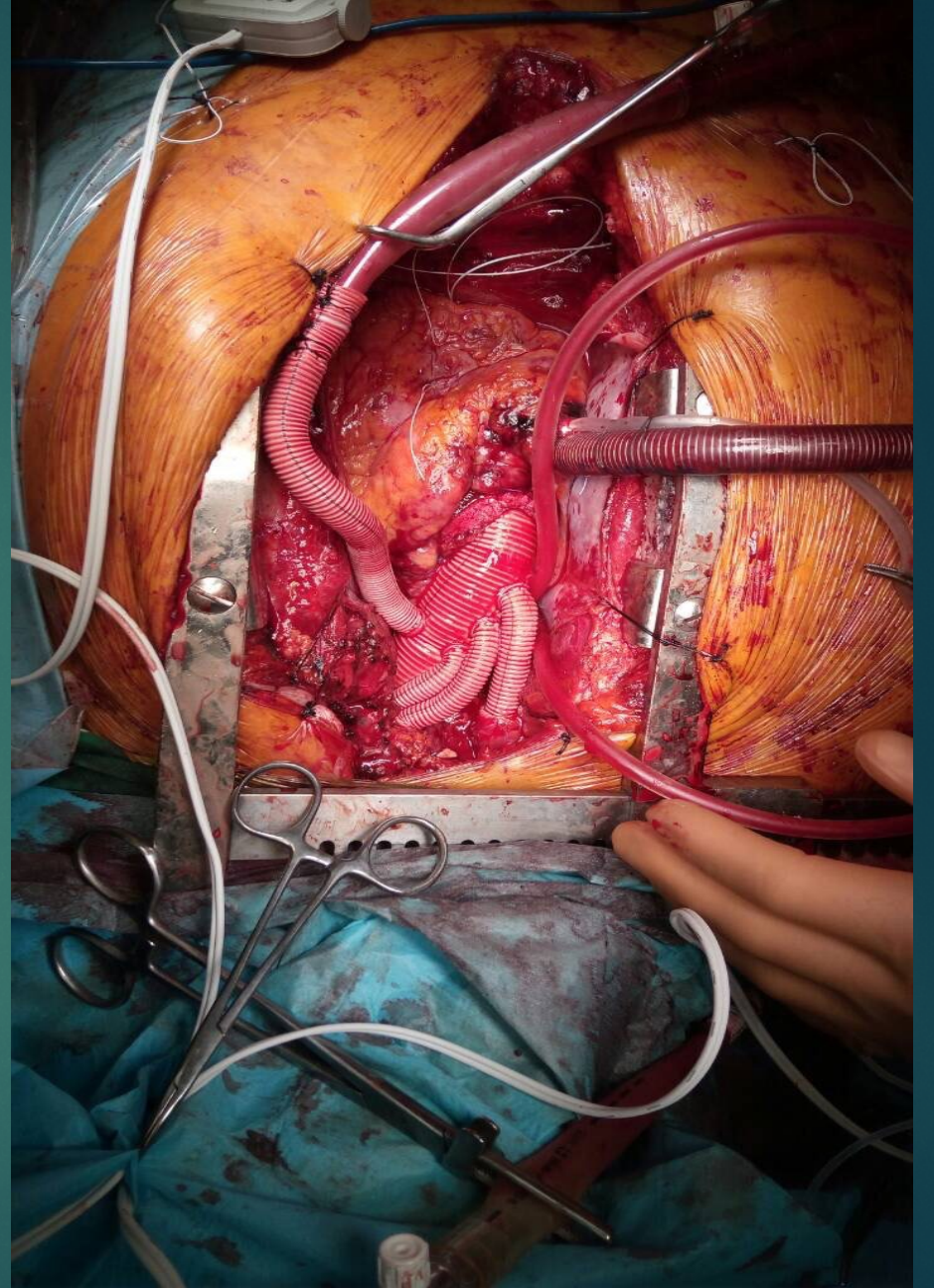
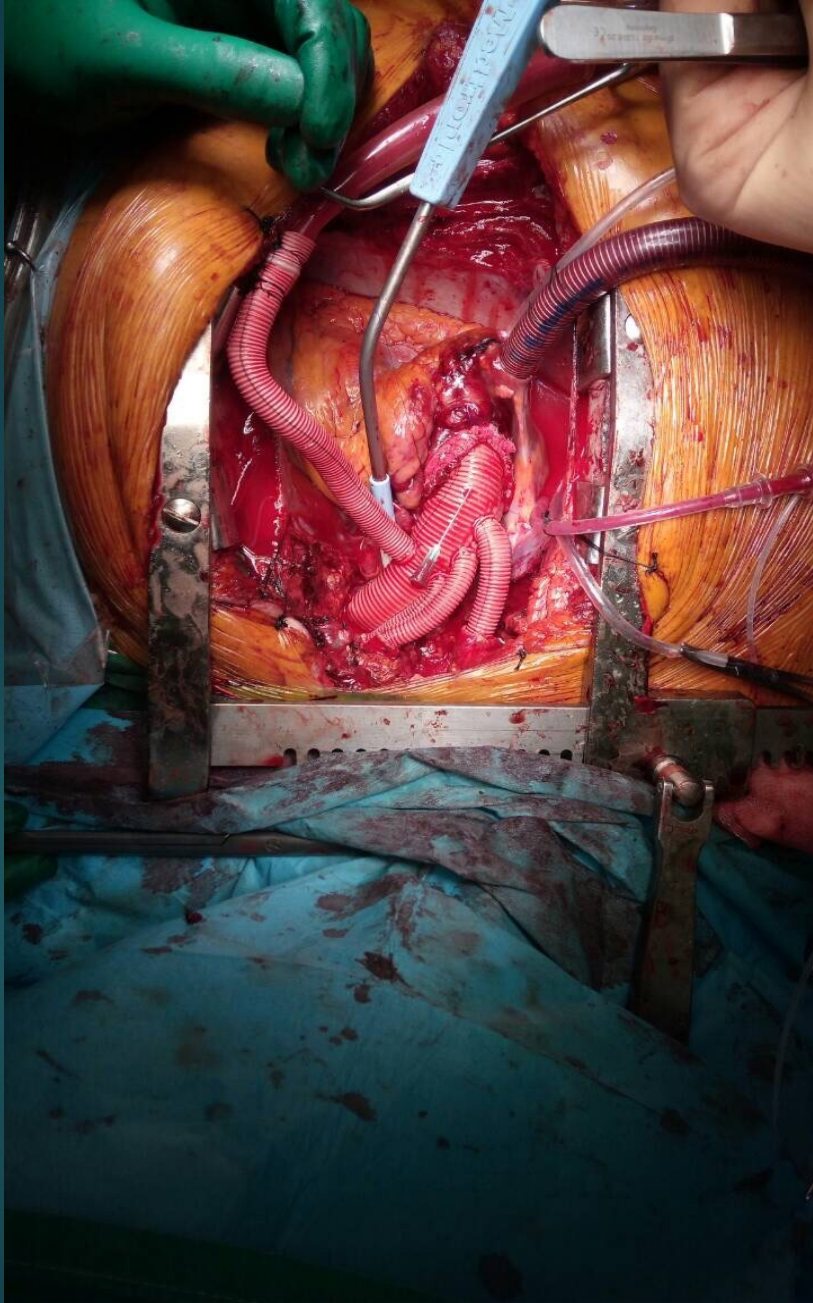




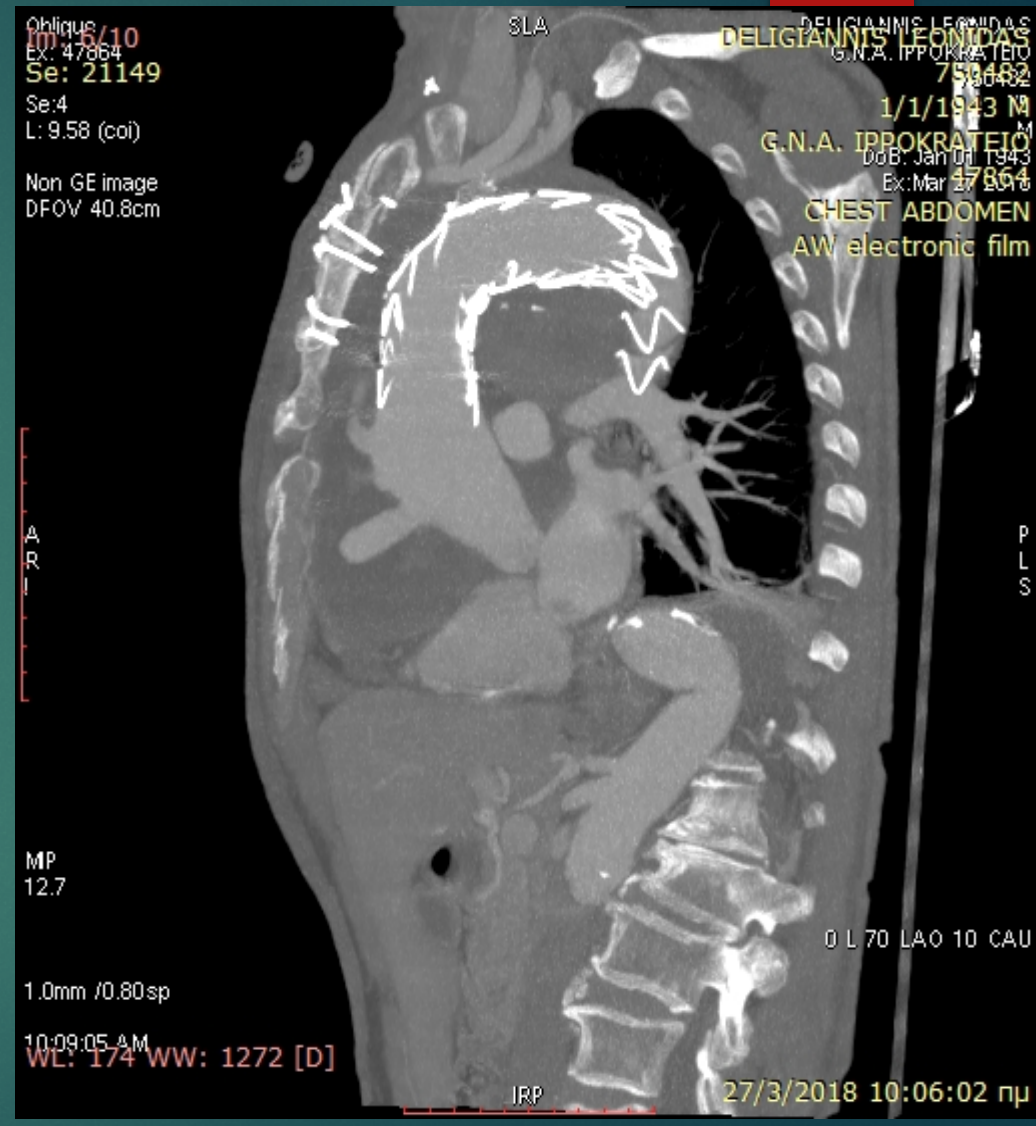
Our Case



Our Case



our case



our case



our case

Anatomic feasibility of an endovascular valve-carrying conduit for the treatment of type A aortic dissection

Maximilian Kreibich, MD¹Correspondence information about the author MD Maximilian KreibichEmail the author MD Maximilian Kreibich, Tobias Soekeland, MS, Friedhelm Beyersdorf, MD, Joseph E. Bavaria, MD, Holger Schröfel, MD, Martin Czerny, MD, MBA, Bartosz Rylski, MD

¹Department of Cardiovascular Surgery, Heart Center University Freiburg, Freiburg, Germany; Faculty of Medicine, University of Freiburg, Freiburg, Germany; Division of Cardiovascular Surgery, Hospital of the University of Pennsylvania, Philadelphia, Pa. Electronic address: maximilian.kreibich@universitaets-herzzentrum.de.

²Department of Cardiovascular Surgery, Heart Center University Freiburg, Freiburg, Germany; Faculty of Medicine, University of Freiburg, Freiburg, Germany.

³Division of Cardiovascular Surgery, Hospital of the University of Pennsylvania, Philadelphia, Pa.

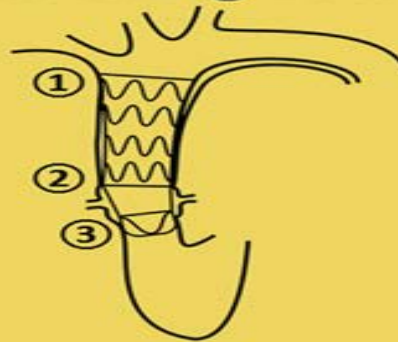
Anatomic Feasibility of an Endovascular Valve-Carrying Conduit for the Treatment of Type A Aortic Dissection

167 patients



With high quality CT scans were screened for anatomic feasibility

3 landing zones



- ① distal sealing zone
- ② proximal sealing zone
- ③ transcatheter valve

113 patients (68 %)



Are potential candidates, but most would require tapered stent-grafts

ΑΝΔΡΟΜΙΚΗ ΚΑΙ ΠΡΟΟΠΤΙΚΗ ΚΑΤΑΓΡΑΦΗ ΑΣΘΕΝΩΝ ΜΕ ΟΞΥ
ΔΙΑΧΩΡΙΣΜΟ ΤΥΠΟΥ Α (1/14-8/19)

ΙΑΤΡΙΚΟ ΦΑΚΕΛΟ

ΑΞΟΝΙΚΗ ΑΓΕΙΟΓΡΑΦΙΑ

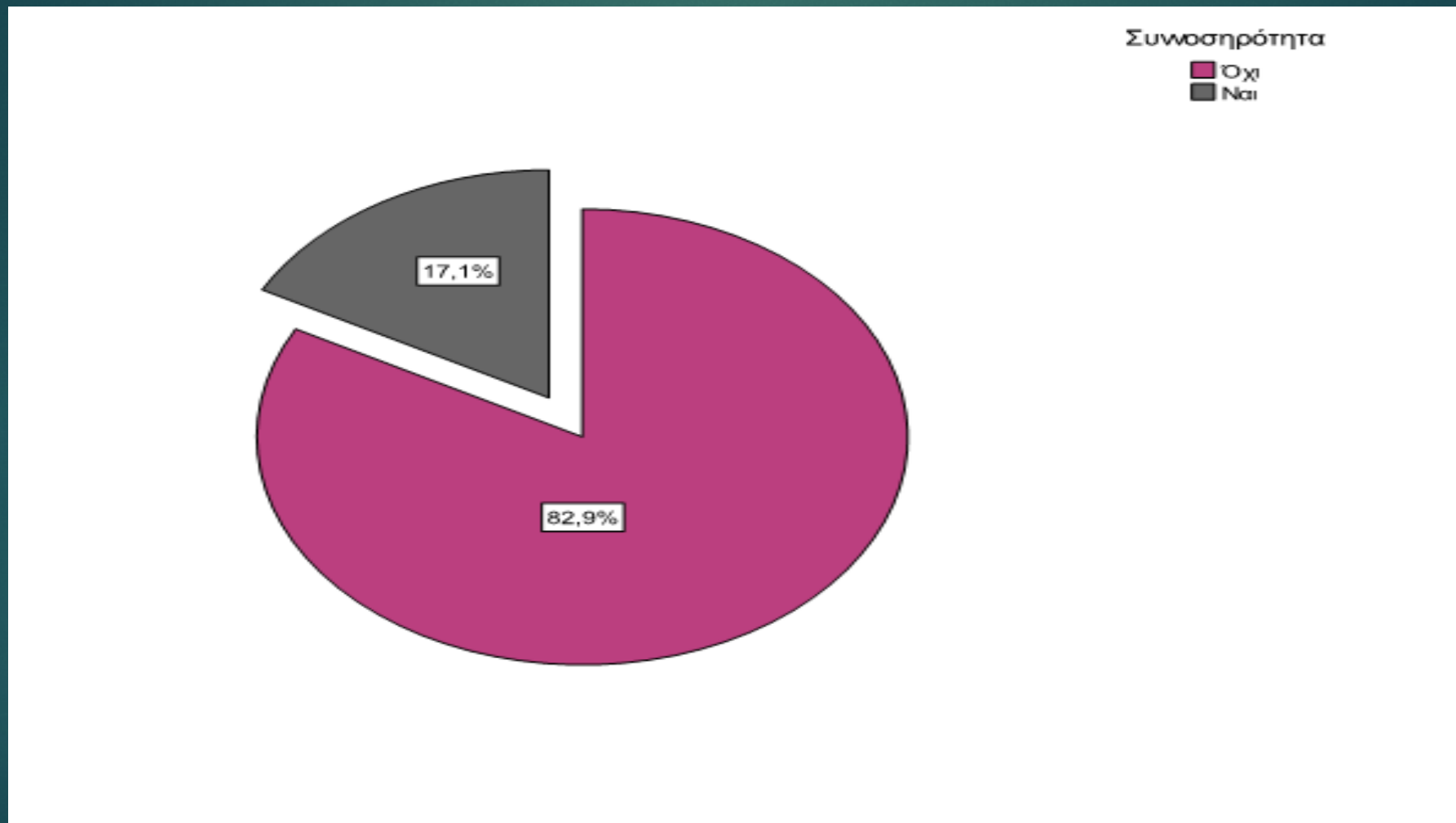
ΠΡΑΚΤΙΚΟ ΧΕΙΡΟΥΡΓΕΙΟΥ

ΑΣΘΕΝΕΙΣ ΥΠΟΨΗΦΙΟΙ ΓΙΑ TEVAR ;

145 ασθενείς με μέση ηλικία τα 62,6 έτη (SD=10,1 έτη) με διαχωρισμο τυπου A Το 17,1% των ασθενών έπασχε από κάποιο συνοδό νόσημα

		N	%
Φύλο	Άντρες	100	68,9
	Γυναίκες	45	31,1
Ηλικία, μέση τιμή (SD)		62,6 (10,1)	
Συννοσηρότητα	Όχι	87	82,9
	Ναι	18	17,1
Αν ναι, τι	ΧΑΠ	6	5,7
	ΧΝΑ	2	1,9
	Καρδιοαγγειακη νοσο	4	3,8
	Ισχαιμια	6	5,7

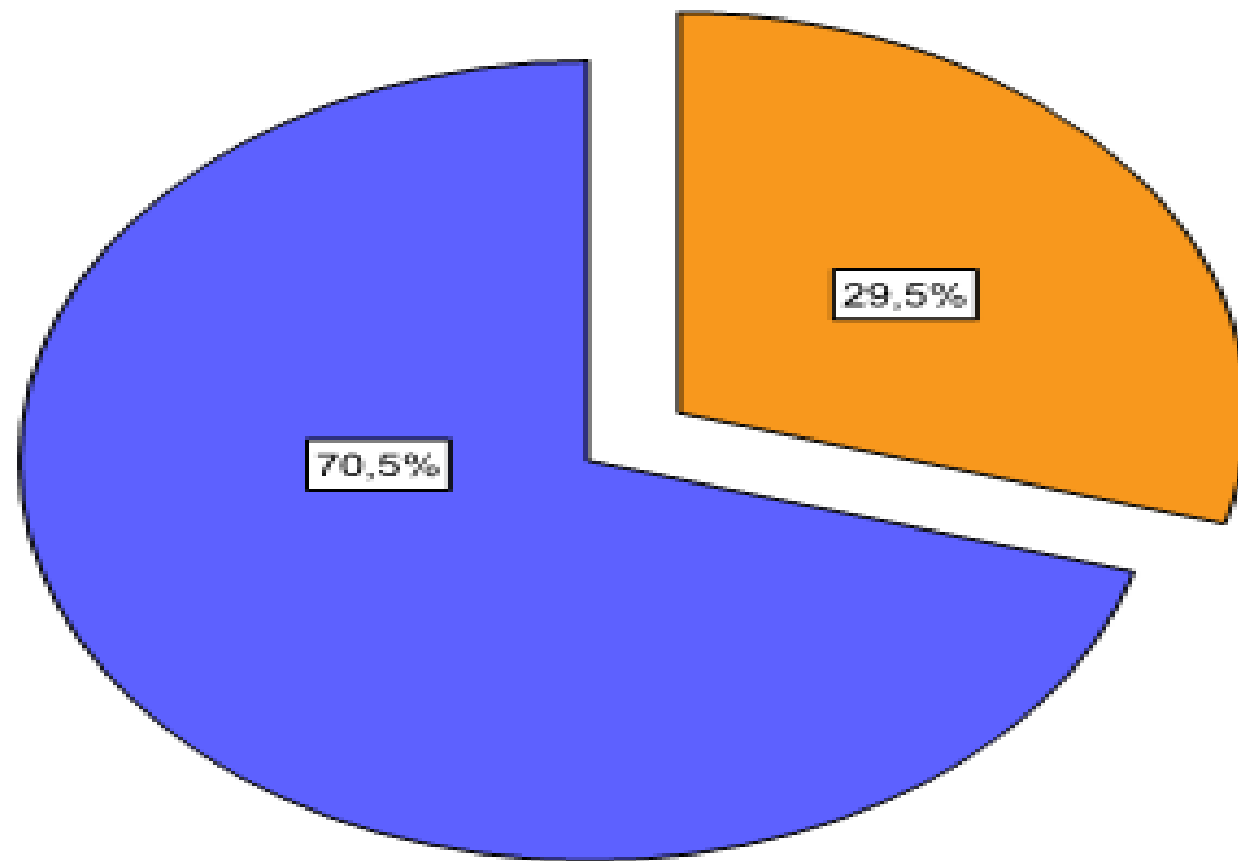
Στο γράφημα που ακολουθεί δίνεται η συννοσηρότητα των ασθενών.



Επέμβαση	N	%
AVR + αντικατάσταση ανιούσης αορτής	3	2,0
Bentall	5	3,44
Bentall και αντικατάσταση ημιτόξου	5	3,44
Bentall και αντικατάσταση τόξου	2	1,9
Αντικατάσταση ανιούσης αορτής	101	69.65
Αντικατάσταση ανιούσης αορτής + αορτικού τόξου	3	2,0
Αντικατάσταση ανιούσης αορτής και ημιτόξου	11	10,5
Αντικατάσταση ανιούσης αορτής και ημιτόξου + CABGX1	3	2,0
Αντικατάσταση ανιούσης αορτής και ημιτόξου + πλαστική αορτικής βαλβίδος + CABGX1	5	3,44
Αντικατάσταση ανιούσης αορτής και ημιτόξου + τοποθέτηση Stent στη κατιούσα θωρακική αορτή (FET)	5	3,44
Αντικατάσταση ανιούσης αορτής και ημιτόξου και ανωνύμου αοτηρίας	2	1,37

Το 74,3% (78) των ασθενών υπεβλήθη σε αντικατάσταση ανιούσης αορτής.

		N	%
Intimal tear >10 mm above the sinotubular junction - Intimal tear >5 mm proximal to the innominate artery -Aortic diameter <40 mm	Όχι	23	29,5
	Ναι	55	70,5
Euroscore, μέση τιμή (SD)		40,1 (22,1)	
Θάνατος στις 30 ημέρες	Όχι	44	56,4
	Ναι	34	43,6

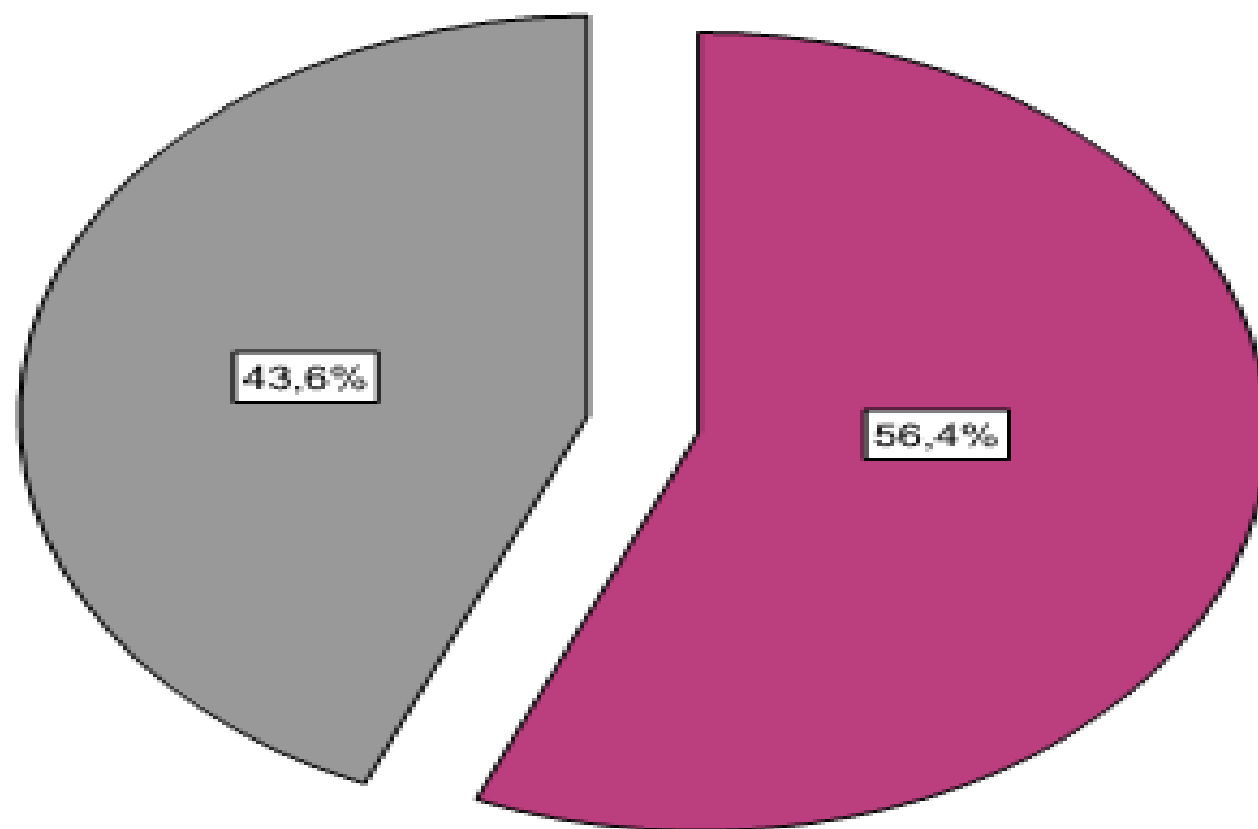


Intimal tear
>10 mm
above the
sinotubular
junction -
Intimal tear
>5 mm
promal to
the
innominate
artery

Yes
No

Θάνατος
στις 30
ημέρες

■ Όχι
■ Ναι



		Intimal tear >10 mm above the sinotubular junction - Intimal tear >5 mm proximal to the innominate artery - Aortic diameter <40 mm				p Pearson's χ^2 test
		Όχι		Ναι		
		N	%	N	%	
Φύλο	Άντρες	17	31,5	37	68,5	0,562
	Γυναίκες	6	25,0	18	75,0	
Ηλικία, μέση τιμή (SD)		58,0 (10,2)		64,3 (10,6)		0,018 ⁺⁺
Συννοσηρότητα	Όχι	18	28,1	46	71,9	0,747 ⁺
	Ναι	5	35,7	9	64,3	
Euroscore, μέση τιμή (SD)		36,9 (20,7)		41,5 (22,7)		0,405 ⁺⁺
Θάνατος στις 30 ημέρες	Όχι	16	36,4	28	63,6	0,130
	Ναι	7	20,6	26	36,4	

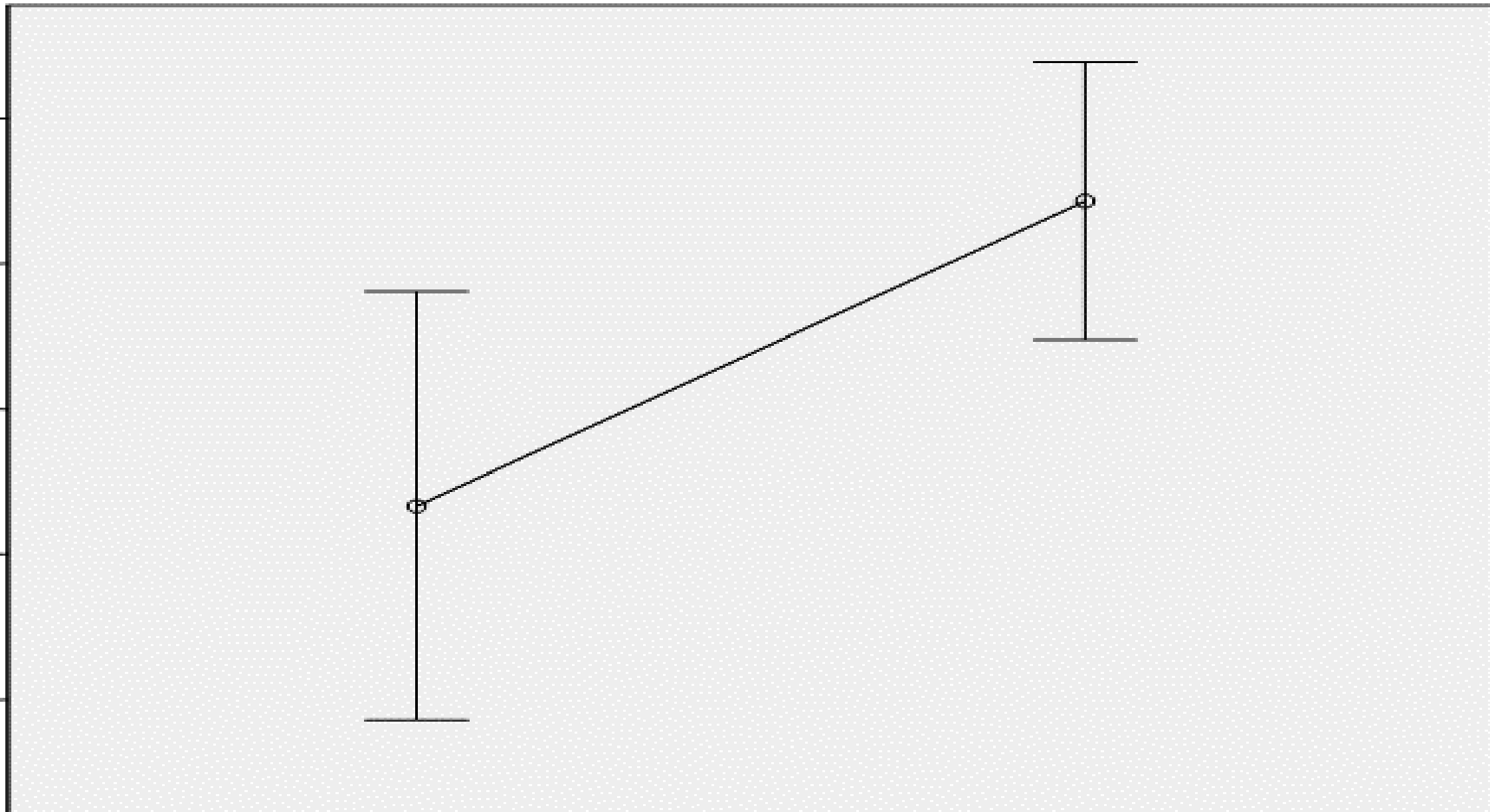
95% CI Ηλικία

66,00
63,00
60,00
57,00
54,00

Όχι

Ναι

Intimal tear >10 mm above the sinotubular junction - Intimal tear >5 mm promal to the innominate artery



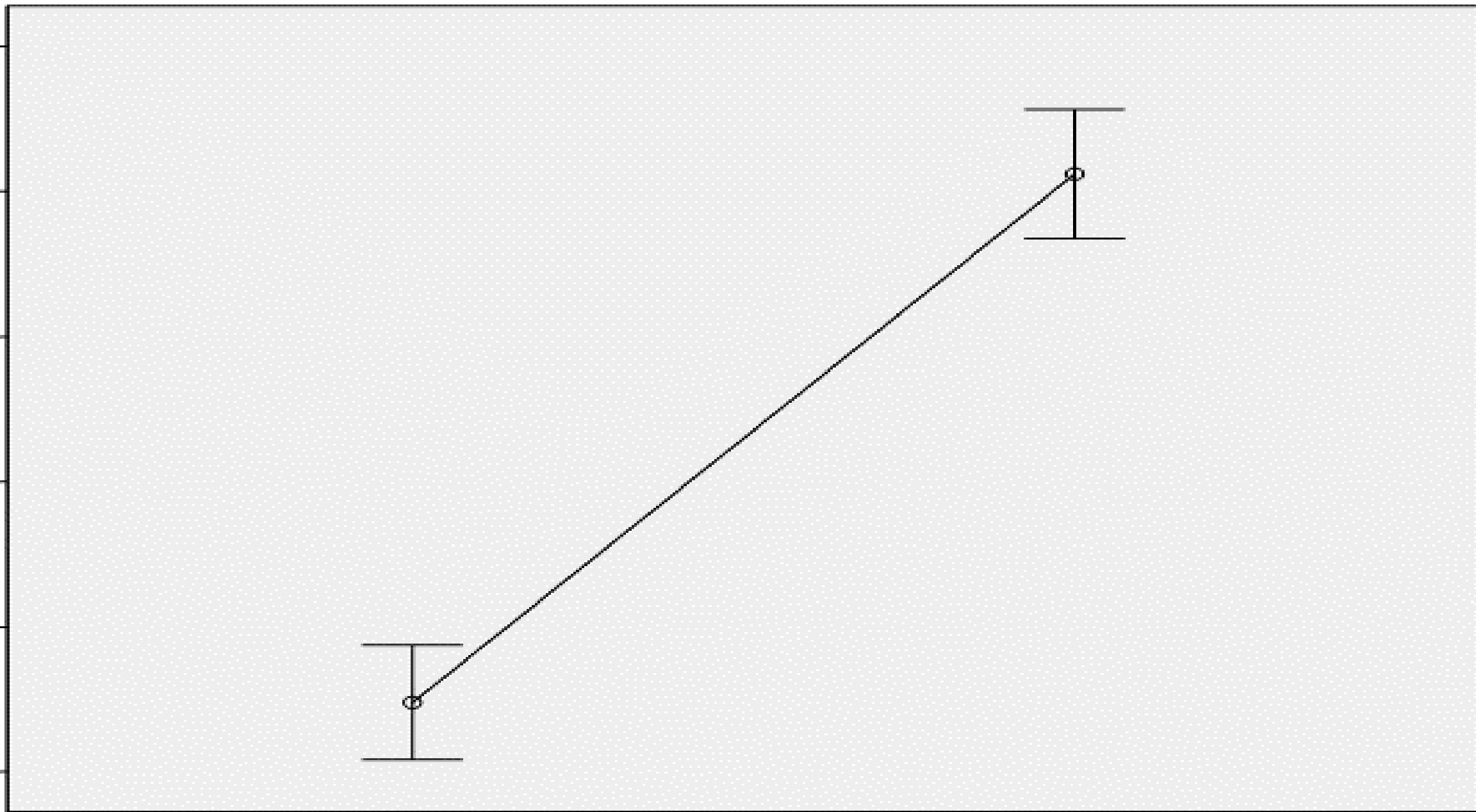
95% CI Euroscore

70
60
50
40
30
20

Όχι

Ναι

Θάνατος στις 30 ημέρες



Συμπέρασμα

Το 70% (101) των ασθενών υπεβλήθη σε αντικατάσταση ανιούσης αορτής

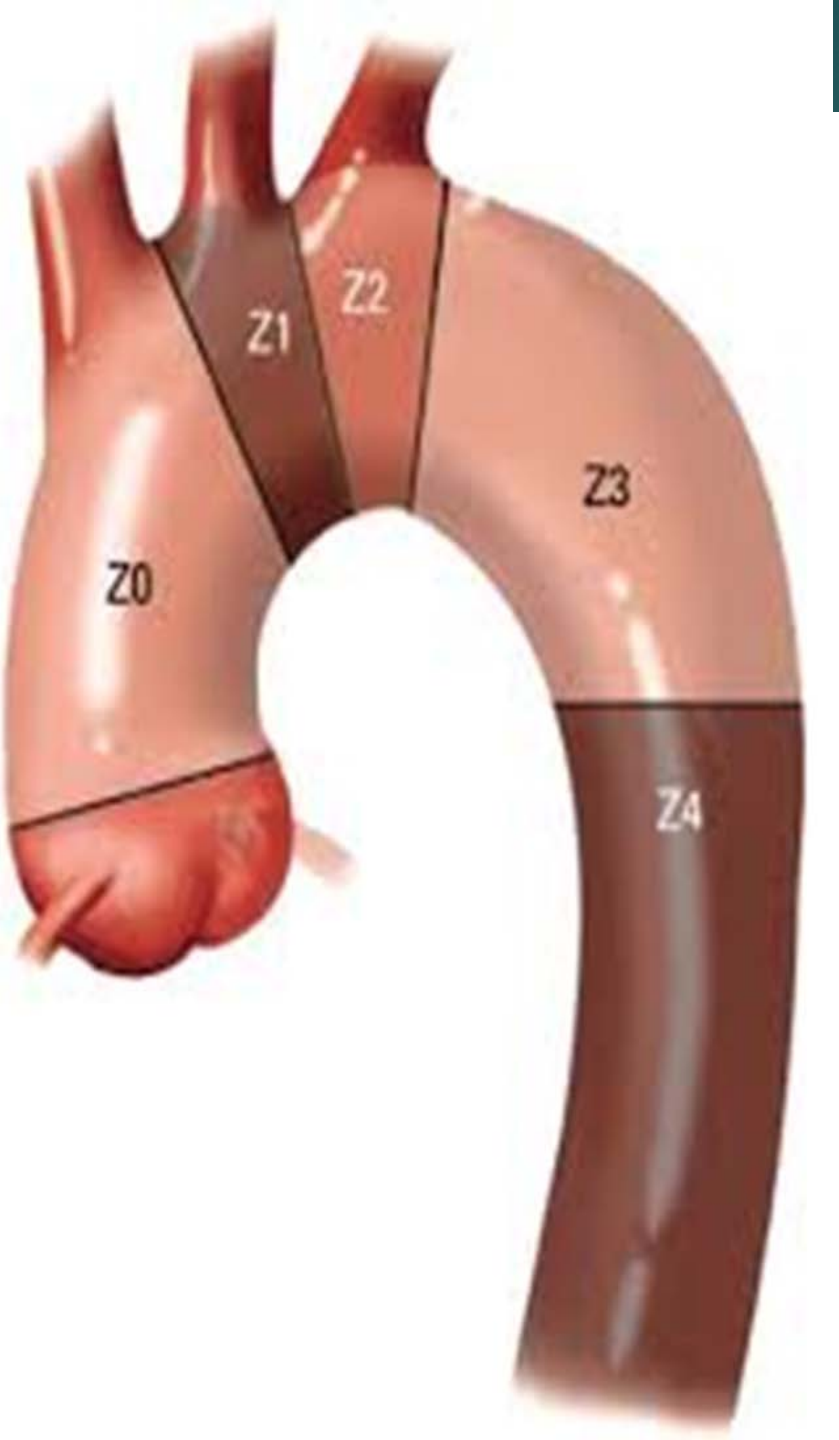
Το 70.5 % (71) τηρούσε τα κριτήρια για TEVAR

Euroscore, μέση τιμή (SD) 22,1

Θάνατος στις 30 ημέρες 36,4 % (20)

Συμπέρασμα

- Η ενδοαγγειακή αποκατάσταση προσφέρει μια εναλλακτική θεραπευτική επιλογή σε επιλεγμένους ασθενείς **υψηλού κινδύνου**.
- Πολλά τεχνικά ζητήματα που πρέπει να επιλυθούν
- Μελλοντικές τεχνολογικές καινοτομίες θα παράσχουν περισσότερες συσκευές και λύσεις
- Καθορισμός ενδείξεων



ΕΥΧΑΡΙΣΤΩ

“So the big picture is that cardiovascular surgeons need to be a major part of this. They need to be aware of this revolution that is beginning.”

“This is a very rich and creative time where we are trying to figure out what we can do, how far we can take it, what’s safe and what’s not.”

Joseph E. Bavaria