

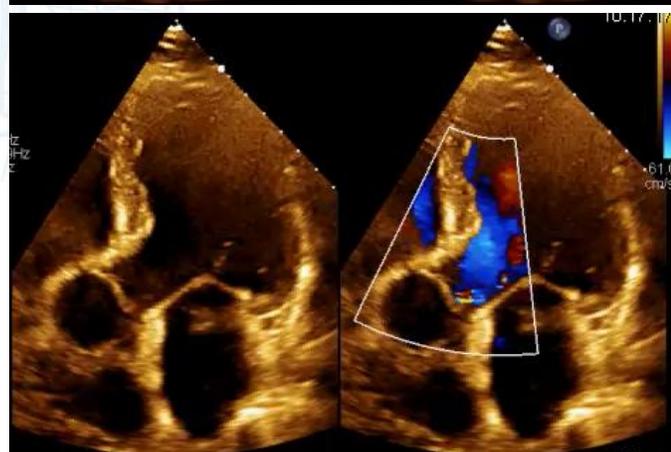
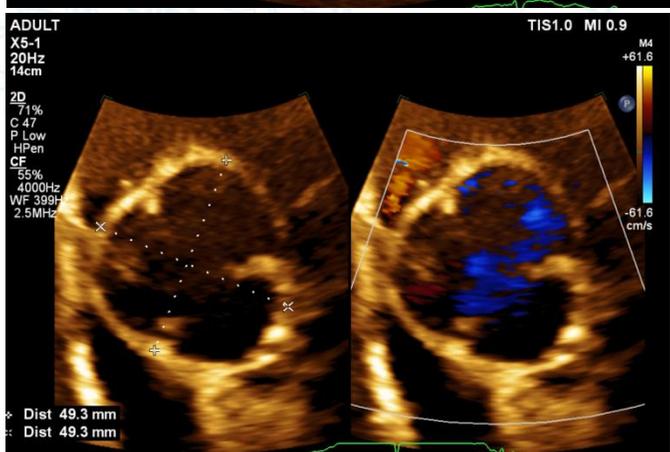
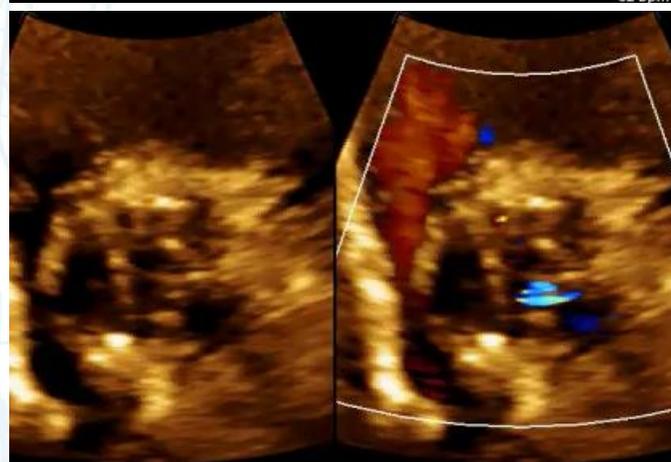
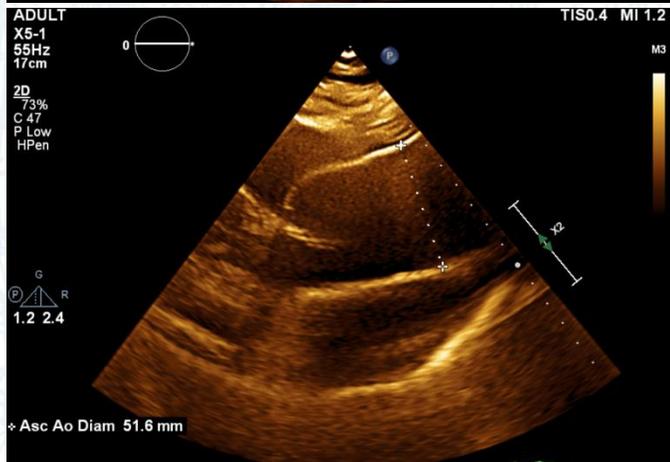
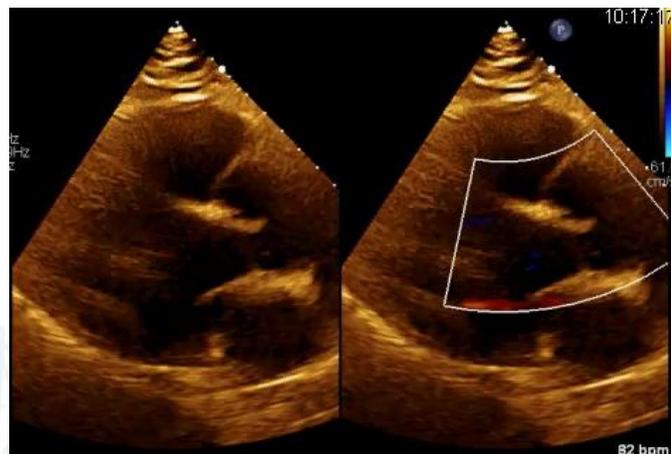
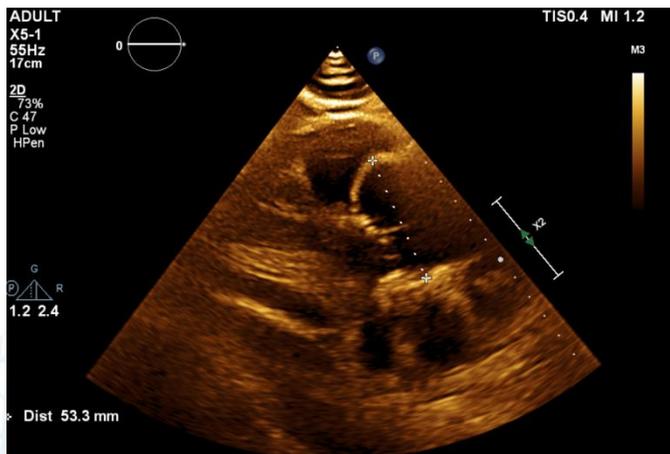


CASE #1 ...aneb jeden rozměr nestačí

Petr Fila
CKTCH Brno

Prague Prevention 2026

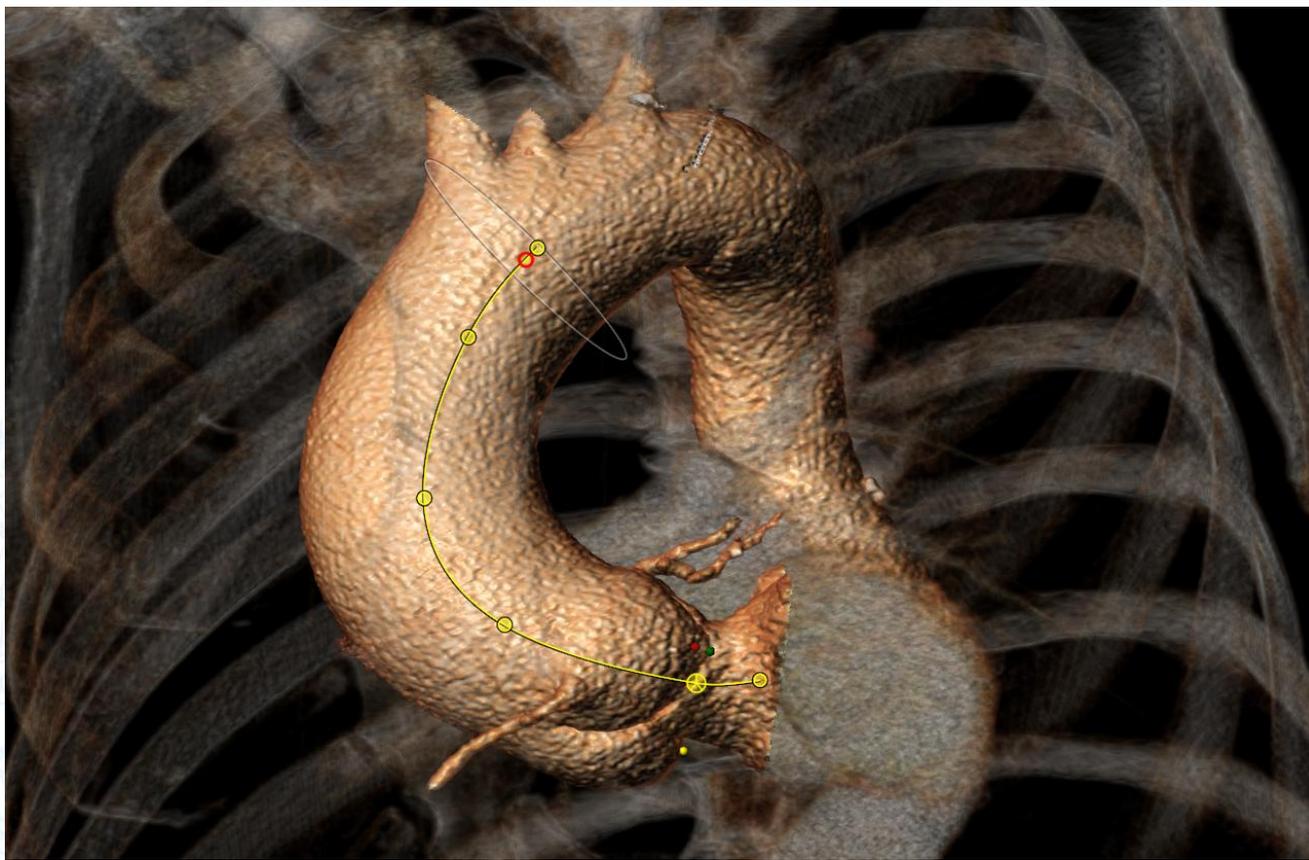
22.-23. ledna 2026 | Autoklub Praha



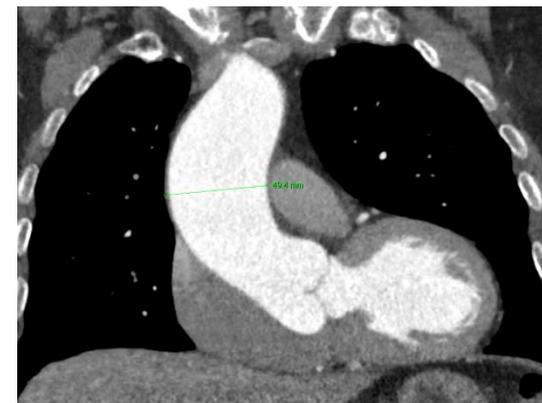
muž, 74 let
hypertenze

EFLK 61%, trojcípá Ao chlopeň, AoR 1+
od 2017 sledován pro dilataci
kořene/asc. aorty

ECHO:
47/52 mm
50/52 mm
50/51 mm



CT
47/50 mm
48/50 mm
48/52 mm
- stacionární nález

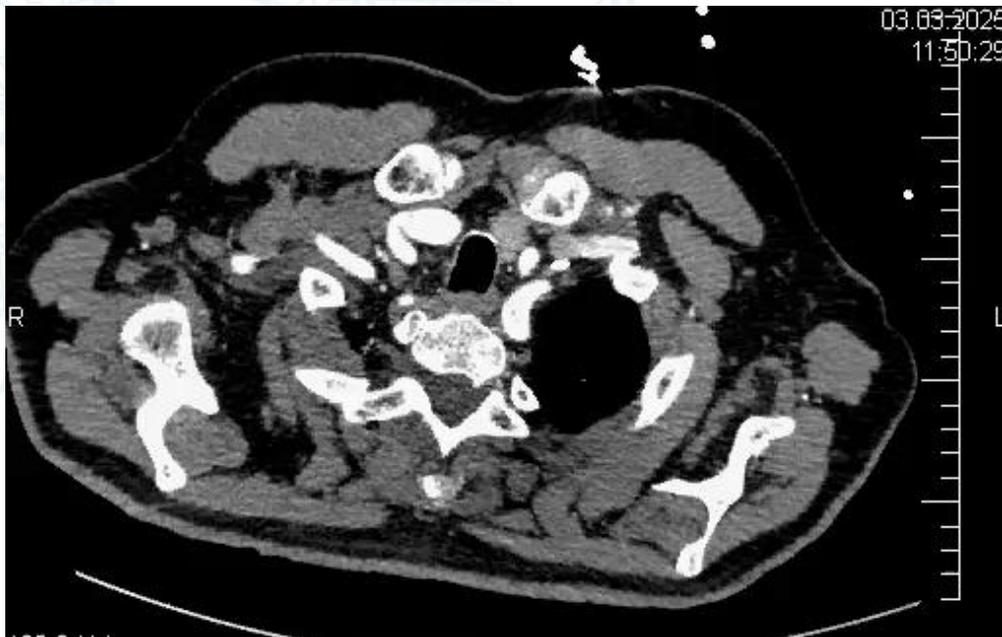
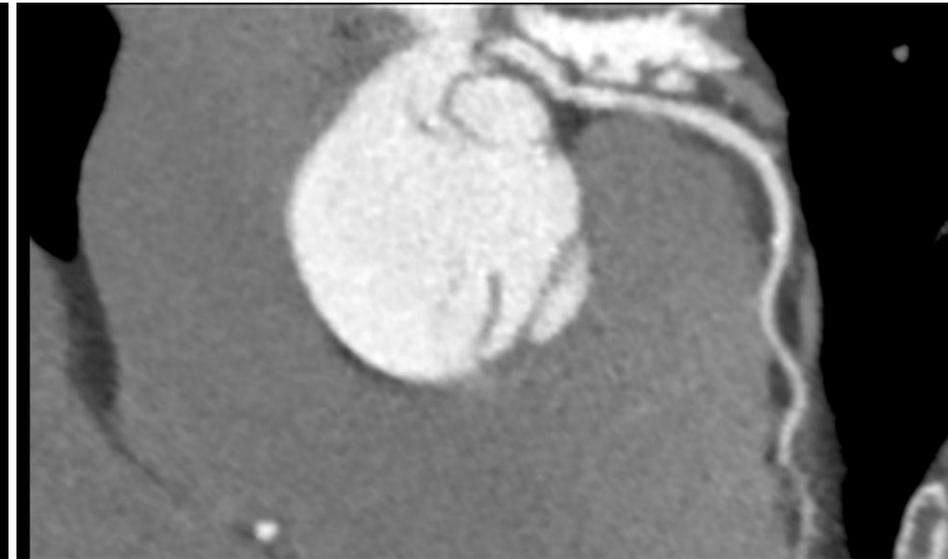
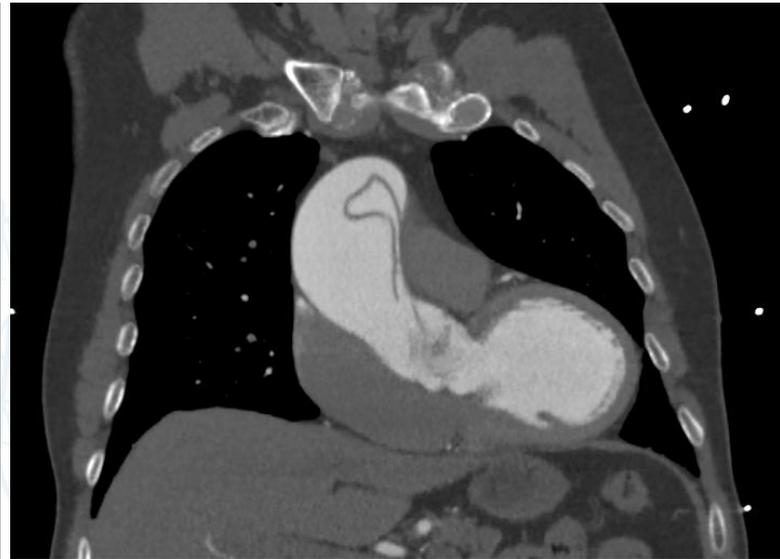


Co s pacientem?

1. Bentallova operace
2. záchovná operace – David/Yacoub
3. PEARS – Exovasc
4. suprakoronární náhrada aorty
5. jiné (bandáž protézou...)
6. sledovat



...o rok později – akutní disekce, na operační sál hypotenzní, po úvodu do CA - KPR

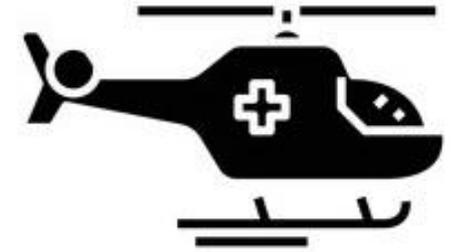
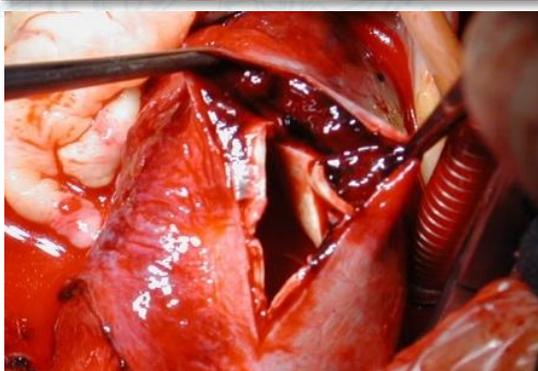
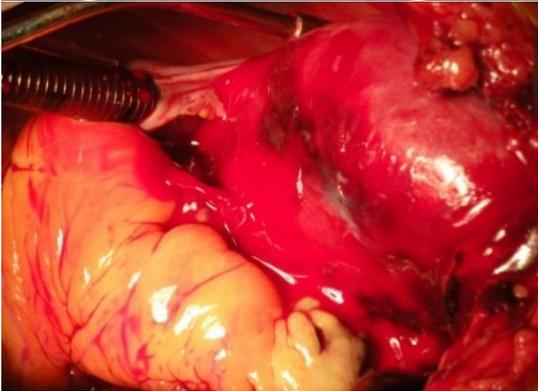
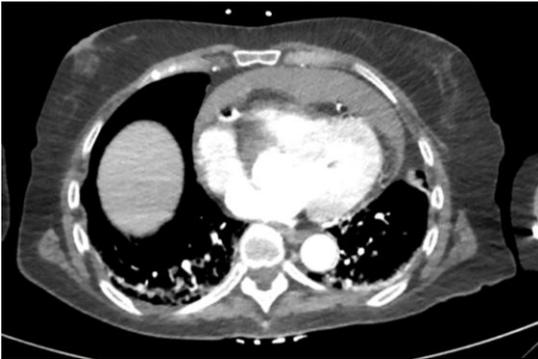


- Bentallova operace, TVP
- anteroextenzivní IM při disekci ostia ACS
- PCI kmene ACS
- Impella 5.5

- pneumonie, sepse, MOF
- exitus 10. POD

Aneurysma aorty – co je cílem léčby?

Cíl? Zabránit dilataci/disekci typu A - vzestupné aorty



- 20-50% zemře, než se dostane do nemocnice/kardiochirurgii
- 50 % neléčených typ A zemře do 48 hod - mortalita 1-2 % / hod
- 30 denní mortalita po operaci 5-24%

Mahase, BMJ 2020; 368 :m304

Gudbjartsson,. Scandinavian Cardiovascular Journal, 2020, 54.1: 1-13.

Predikce disekce aorty typu A

Aortic Diameter ≥ 5.5 cm Is Not a Good Predictor of Type A Aortic Dissection

Observations From the International Registry of Acute Aortic Dissection (IRAD)

Linda A. Pape, MD; Thomas T. Tsai, MD; Eric M. Isselbacher, MD; Jae K. Oh, MD; Patrick T. O'Gara, MD; Arturo Evangelista, MD; Rossella Fattori, MD; Gabriel Meinhardt, MD; Santi Trimarchi, MD; Eduardo Bossone, MD; Toru Suzuki, MD; Jeanna V. Cooper, MS; James B. Froehlich, MD, MPH; Christoph A. Nienaber, MD; Kim A. Eagle, MD; on behalf of the International Registry of Acute Aortic Dissection (IRAD) Investigators

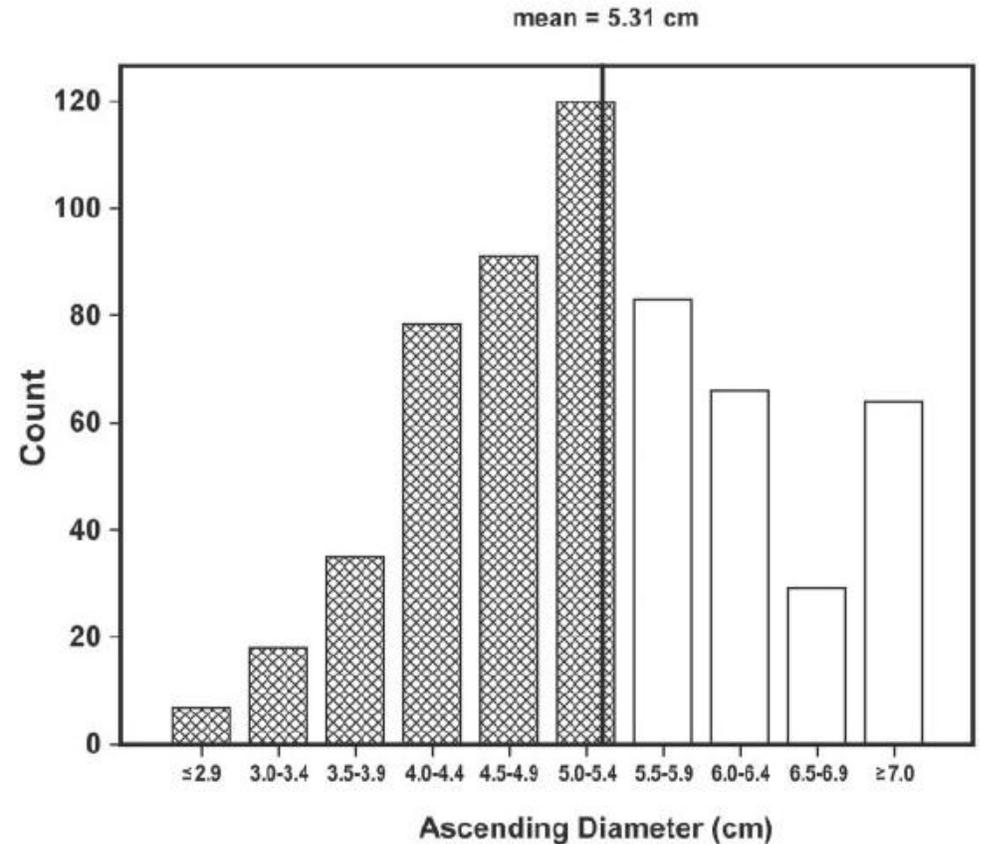
IRAD registr, n=591

40% <50mm; 59% <55mm

mortalita bez korelace s rozměrem aorty

TABLE 4. Independent Predictors of Dissection at Diameters <5.5 cm

| | Odds Ratio | 95% Confidence Interval | P |
|-------------------------|------------|-------------------------|------|
| History of hypertension | 2.17 | 1.03 to 4.57 | 0.04 |
| Radiating pain | 2.08 | 1.08 to 4.0 | 0.03 |
| Age | 1.03 | 1.00 to 1.05 | 0.03 |



Predikce disekce aorty typu A

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY
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AND THE AMERICAN HEART ASSOCIATION, INC.
PUBLISHED BY ELSEVIER

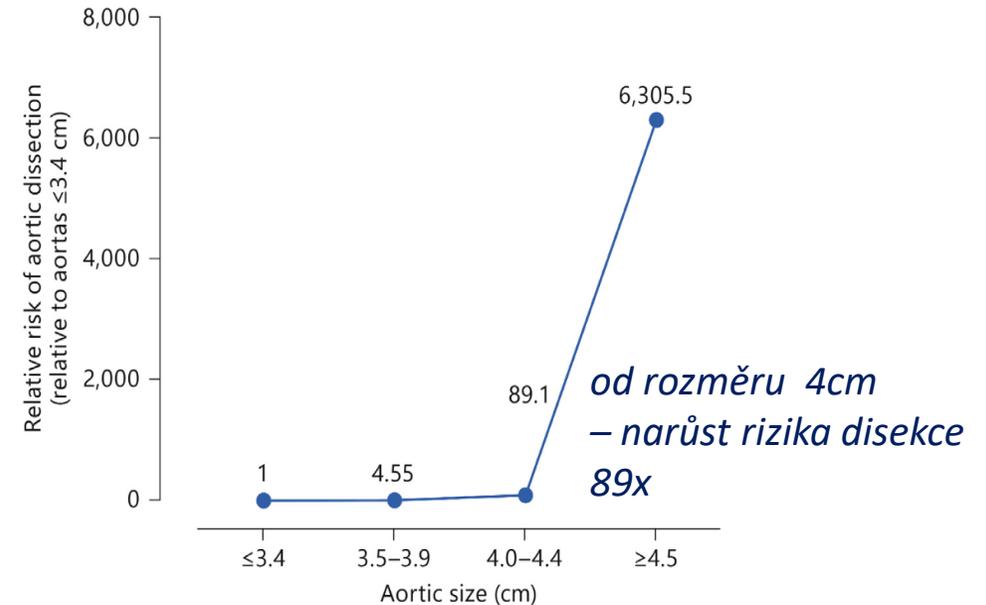
VOL. 80, NO. 24, 2022

CLINICAL PRACTICE GUIDELINE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease



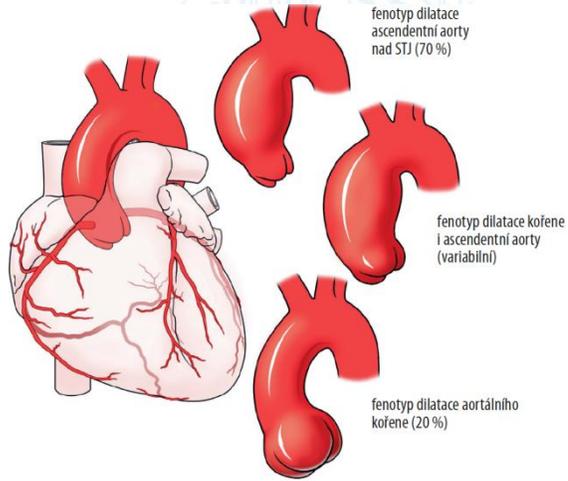
FIGURE 5 Relative Risk of Aortic Dissection by Size Range



The relative risk of aortic dissection begins to increase appreciably at a diameter of 4.0 cm to 4.4 cm and then increases dramatically at a diameter of ≥4.5 cm. Reprinted from Paruchuri et al.⁵ Copyright 2005, with permission from Karger Publishers, Basel Switzerland.

- In asymptomatic patients with aneurysms of the aortic root or ascending aorta who have a maximum diameter of ≥5.0 cm, surgery is reasonable when performed by experienced surgeons in a Multidisciplinary Aortic Team.¹⁴⁻¹⁷

Hranice pro výkon na aortě



- Marfan + RF (IIa)
- výkon na Ao chlopni

- Marfan (I)
- BAV root (I)
- BAV asc. + RF (IIa)
- TAV root low-risk (IIa)

- izolované aneurysma
- BAV asc. (I)
- TAV (I)



- PRKG1 + RF

- ACT2 + RF
- PRKG1

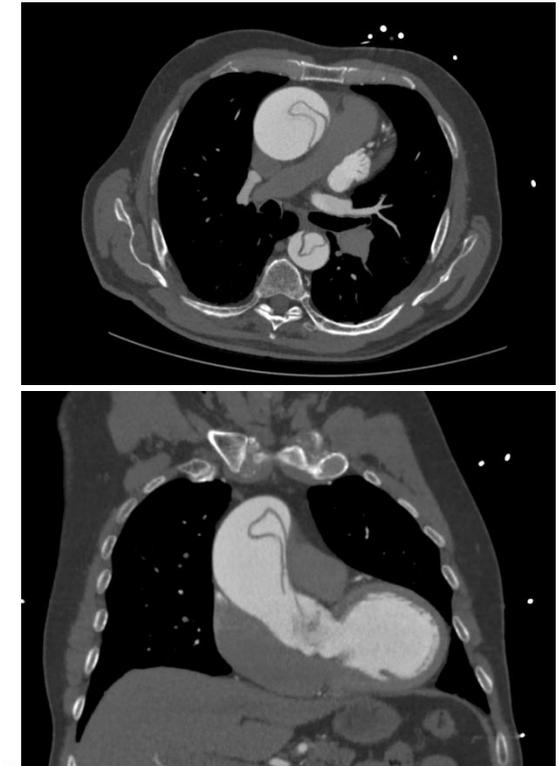
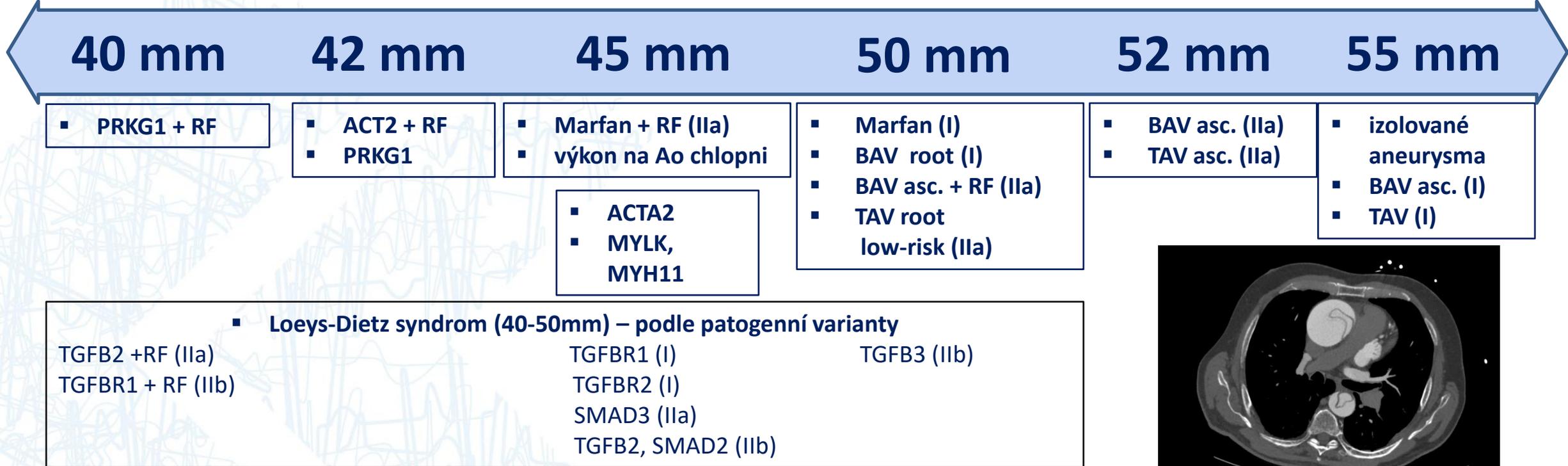
- ACTA2
- MYLK, MYH11

- BAV asc. (IIa)
- TAV asc. (IIa)

- Loeys-Dietz syndrom (40-50mm) – podle patogenní varianty
 - TGFB2 +RF (IIa)
 - TGFBR1 + RF (IIb)
 - TGFBR1 (I)
 - TGFBR2 (I)
 - SMAD3 (IIa)
 - TGFB2, SMAD2 (IIb)
 - TGFB3 (IIb)

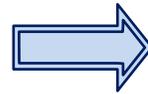
Czerny, European Journal of Cardio-Thoracic Surgery, 2024, 65.2: ezad426.
 Mazzolai, European heart journal, 2024, 45.36: 3538-3700.

Hranice pro výkon na aortě



Rizikové faktory disekce

- hypertenze
- bikuspidní Ao chlopeň
- degenerace/zánět onemocnění aortální stěny
- ateroskleróza
- geneticky podmíněná aortopatie
Marfan, Ehlers-Danlos, Loeys-Dietz syndrom,
Turner ... ACTA2, MYH11, MYLK, PRKG...
- tupé trauma
- polycystická choroba ledvin
- koarktace
- iatrogenní
- ...



**nejen dilatace
(příčný rozměr) aorty!**

Co dalšího hraje roli?

Riziko disekce dle geometrie aorty

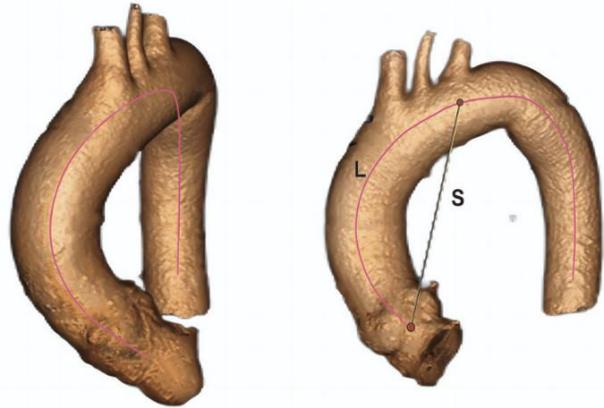
European Journal of Cardio-Thoracic Surgery 2024, 65(1), ezae016
<https://doi.org/10.1093/ejcts/ezae016> Advance Access publication 13 January 2024

ORIGINAL ARTICLE

Cite this article as: Sun L, Li H, Feng X, Li X, Wang G, Sun J et al. Morphological risk of acute type A aortic dissection in the mildly to moderately dilated aorta. Eur J Cardiothorac Surg 2024; doi:10.1093/ejcts/ezae016.

Morphological risk of acute type A aortic dissection in the mildly to moderately dilated aorta

Lianjie Sun ^{a,1}, Haoyou Li ^{a,1}, Xiangzhen Feng ^{b,1}, Xiao Li ^c, Guoqing Wang ^b, Jianchao Sun ^b, Xiaoming Zhang ^b, Wenfeng Zhang ^a, Jianxun Wang ^b, Zhaozhuo Niu ^a and Gaoli Liu ^{b,*}



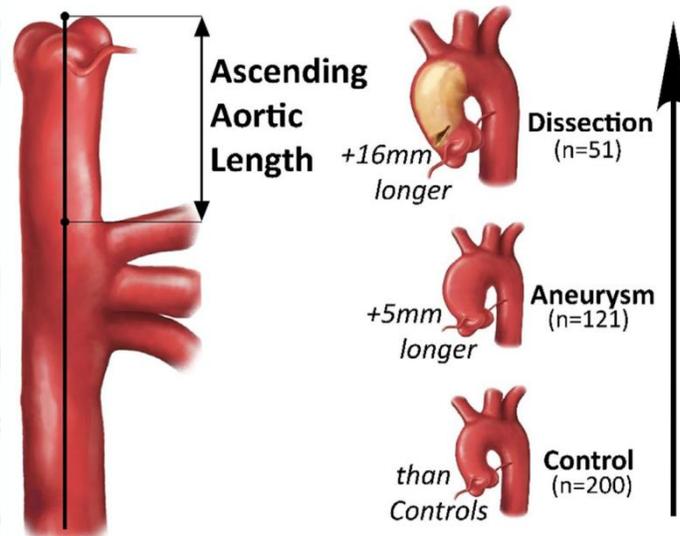
Central image: Three-dimensional morphology of thoracic aorta; The ratio between the length of ascending and the arch(annulus to left subclavian artery origin, L) at centerline and direct straight distance between the same two planes (annulus and left subclavian artery origin, S) used to quantify the curvature of the ascending aorta and aortic arch.

Journal of the American Heart Association

ORIGINAL RESEARCH

Ascending Aortic Length and Its Association With Type A Aortic Dissection

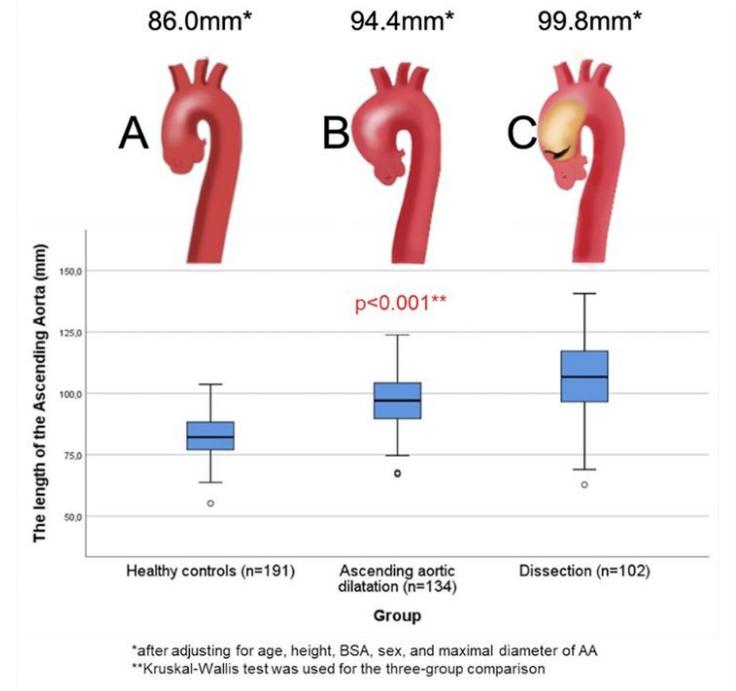
Daniella Eliathamby, BSc; Mariana Gutierrez, BSc, MSc; Aileen Liu, BSc; Maral Ouzounian, MD, PhD; Thomas L. Forbes, MD; Kong Teng Tan, MD; Jennifer Chung ^a, MD, MSc



*after adjustment for age, sex, and aortic diameter

Association of the ascending aortic length with acute type A aortic dissection: A retrospective cohort study

Tarmo Korpela ^a, Elina Salomaa, Petteri Kauhanen, Tuomas Selander, Marja Hedman and Annastiina Husso



Sun, EJCTS, 2024, 65.1: ezae016.

Eliathamby, Journal of the American Heart Association, 2021, 10.13: e020140.

Korpela, Scandinavian Journal of Surgery, 2025, 114.1: 56-64.

Riziko disekce dle geometrie aorty

European Journal of Cardio-Thoracic Surgery 2024, 65(1), ezae016
https://doi.org/10.1093/ejcts/ezae016 Advance Access publication 13 January 2024

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Journal of the American Heart Association

ORIGINAL RESEARCH

Ascending Aortic Length and Its Association With Type A Aortic Dissection

Daniella Eliathamby, BSc; Mariana Gutierrez, BSc, MSc; Aileen Liu, BSc; Maral Ouzounian, MD, PhD; Thomas L. Forbes, MD; Kong Teng Tan, MD; Jennifer Chung ¹, MD, MSc

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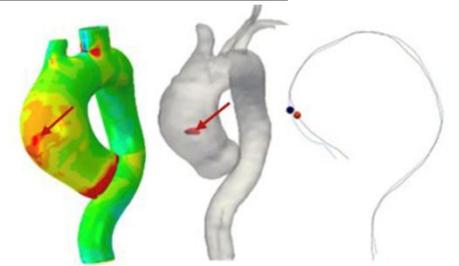
délka acendentní aorty
úhel asc/oblouk <130° ???



srovnatelný / větší prediktor disekce
než průměr aorty

průměr, délka, úhel,... genetika...

identifikace pacientů, kteří budou
profitovat z preventivního výkonu



Sun, EJCTS, 2024, 65.1: ezae016.

Eliathamby, Journal of the American Heart Association, 2021, 10.13: e020140.

Korpela, Scandinavian Journal of Surgery, 2025, 114.1: 56-64.

MUNI
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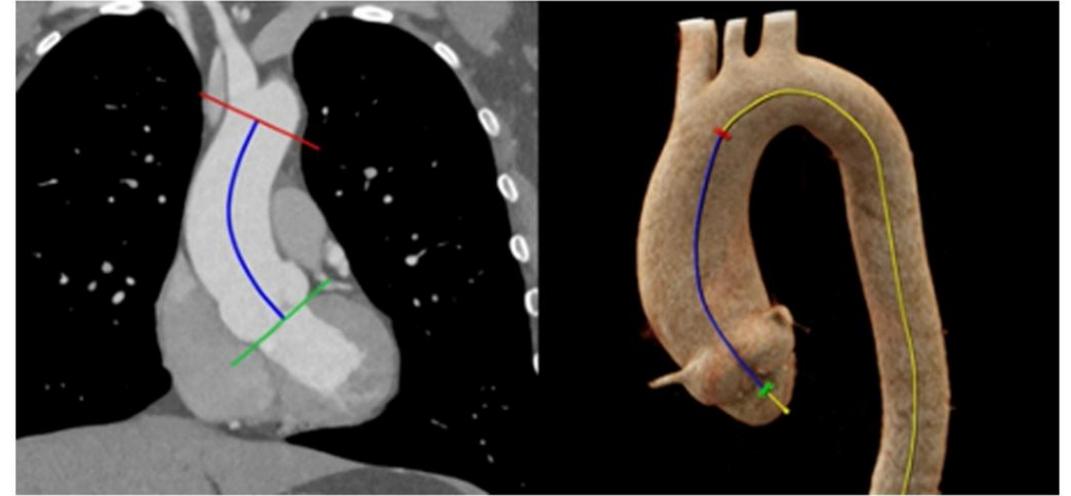
CKTCH

Centrum kardiologické
a transplantáční chirurgie

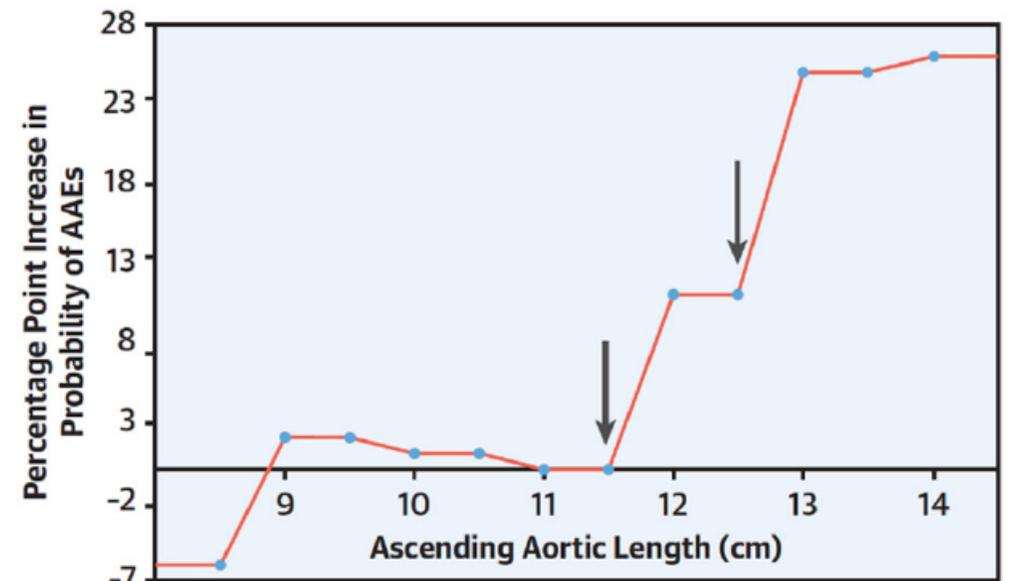
Riziko elongace aorty

EACTS/STS Guidelines for diagnosing and treating acute and chronic syndromes of the aortic organ

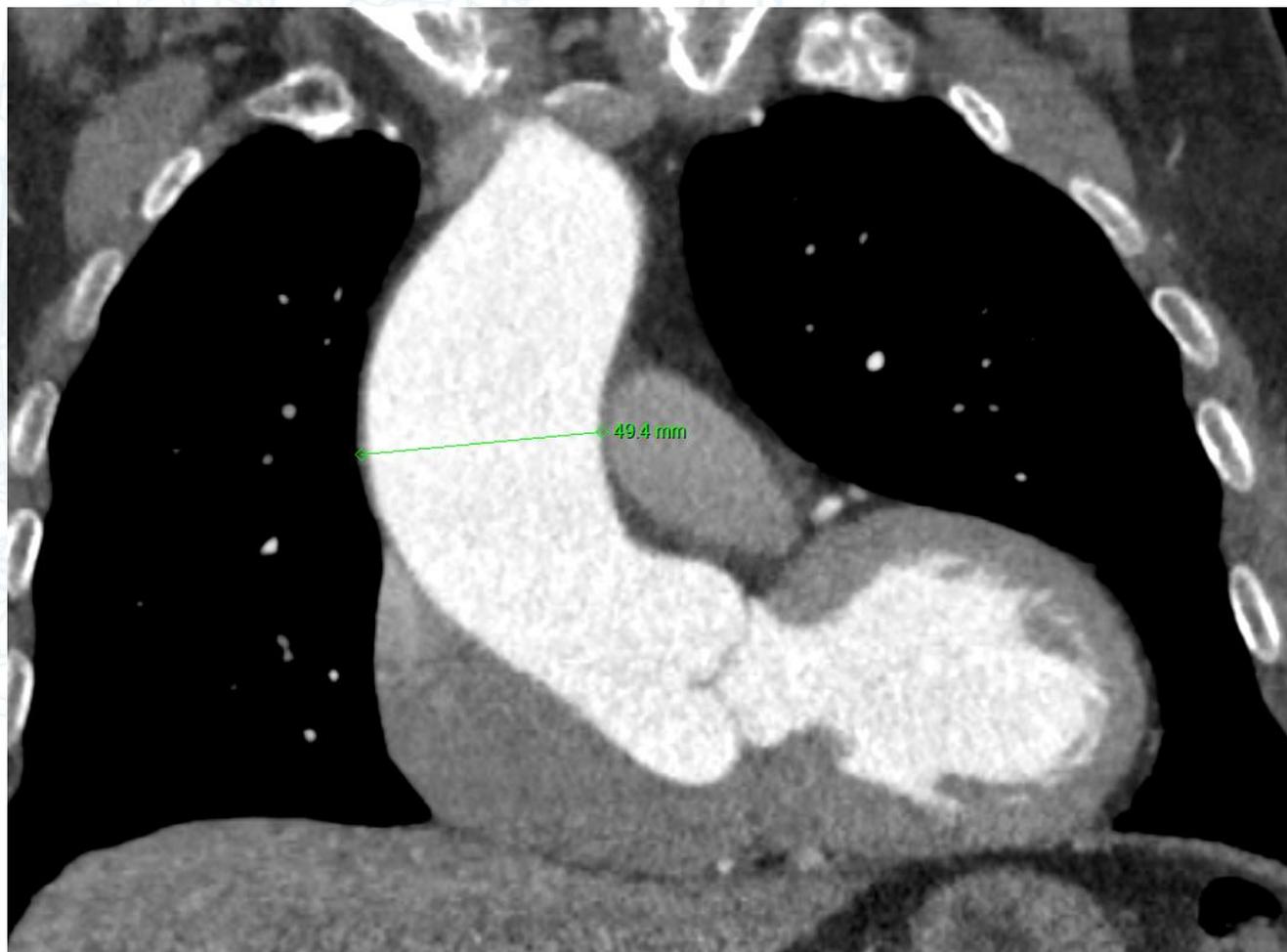
Authors/Task Force Members: Martin Czerny ^{a,b,*†} (Co-Chairperson) (Germany), Martin Grabenwöger ^{c,d,*†} (Co-Chairperson) (Austria), Tim Berger ^{a,b} (Task Force Coordinator), Victor Aboyans ^{e,f} (France), Alessandro Della Corte ^{g,h} (Italy), Edward P. Chen ⁱ (USA), Nimesh D. Desai ^j (USA), Julia Dumfarth ^k (Austria), John A. Elefteriades ^l (USA), Christian D. Etz ^m (Germany), Karen M. Kim ⁿ (USA), Maximilian Kreibich ^{a,b} (Germany), Mario Lescan ^o (Germany), Luca Di Marco ^p (Italy), Andreas Martens ^{q,r} (Germany), Carlos A. Mestres ^s (South Africa), Milan Milojevic ^t (Serbia), Christoph A. Nienaber ^{u,v} (UK), Gabriele Piffaretti ^w (Italy), Ourania Preventza ^x (USA), Eduard Quintana ^y (Spain), Bartosz Rylski ^{a,b} (Germany), Christopher L. Schlett ^{b,z} (Germany), Florian Schoenhoff ^{aa} (Switzerland), Santi Trimarchi ^{ab} (Italy) and Konstantinos Tsagakis ^{ac} (Germany), EACTS/STS Scientific Document Group



| Recommendations | Class ^a | Level ^b | Ref ^c |
|--|--------------------|--------------------|------------------|
| Surgery should be considered for a symptomatic aneurysm of the ascending aorta, almost independently of size (once non-aortic causes have been eliminated). | IIa | C | - |
| For individuals of small body size, height nomograms should be considered in the decision about indications for surgery at various aortic dimensions. | IIa | B | [340] |
| An ascending aortic length exceeding 110 mm should be considered as a risk factor for aortic events when indicating elective surgery for aortic aneurysms. | IIa | B | [196] |
| Despite metrics and precision criteria, the benefits and risks of surgical intervention versus nonoperative management should be considered on a case-by-case basis. | IIa | C | - |

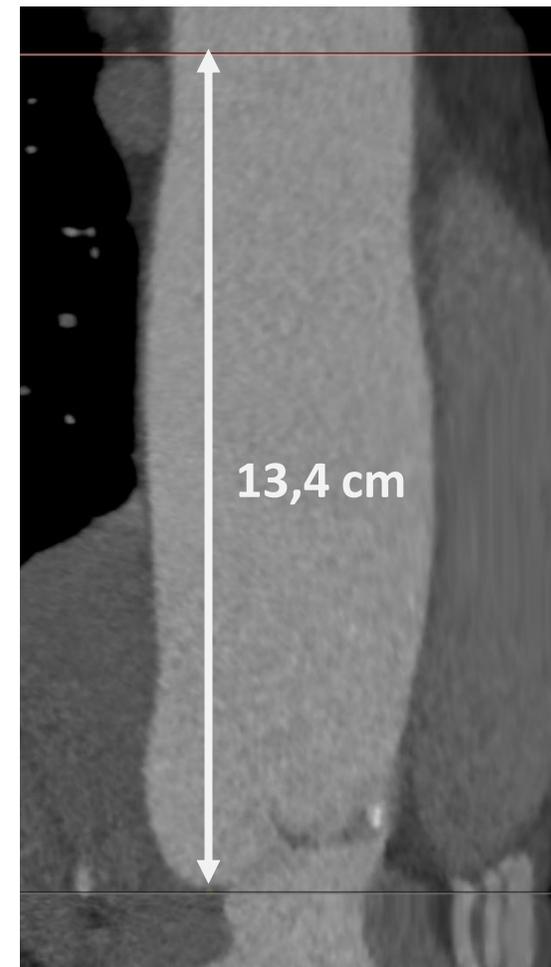
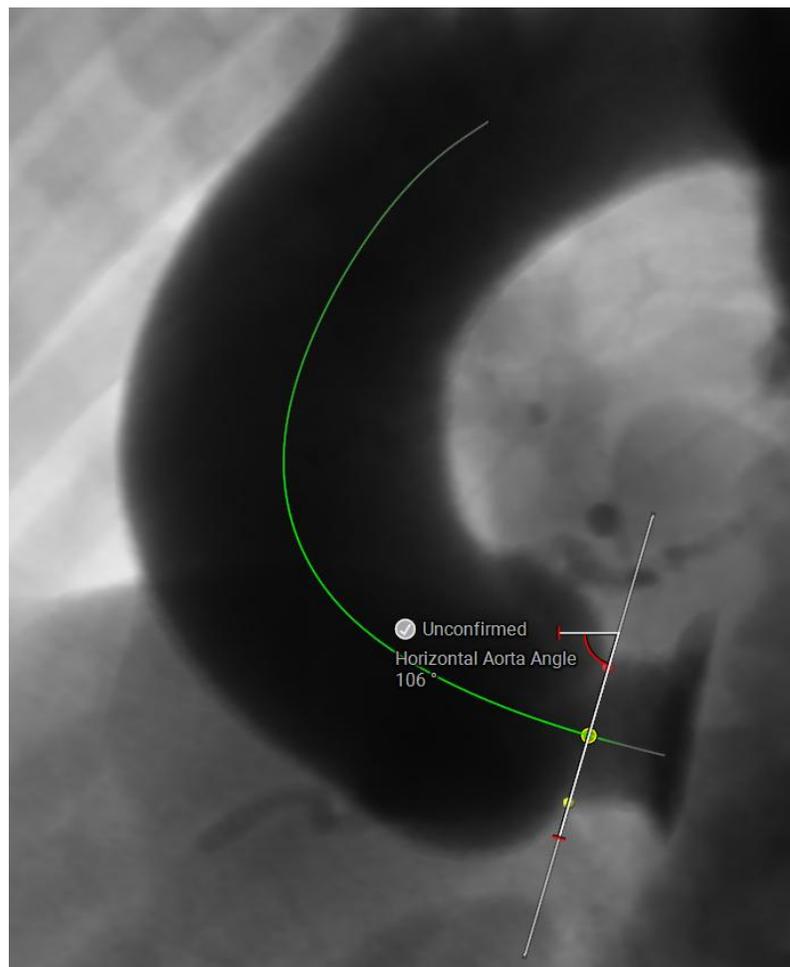


Muž, 74 let
2024 ECHO 50/51, CT 48/52 – stacionární nález

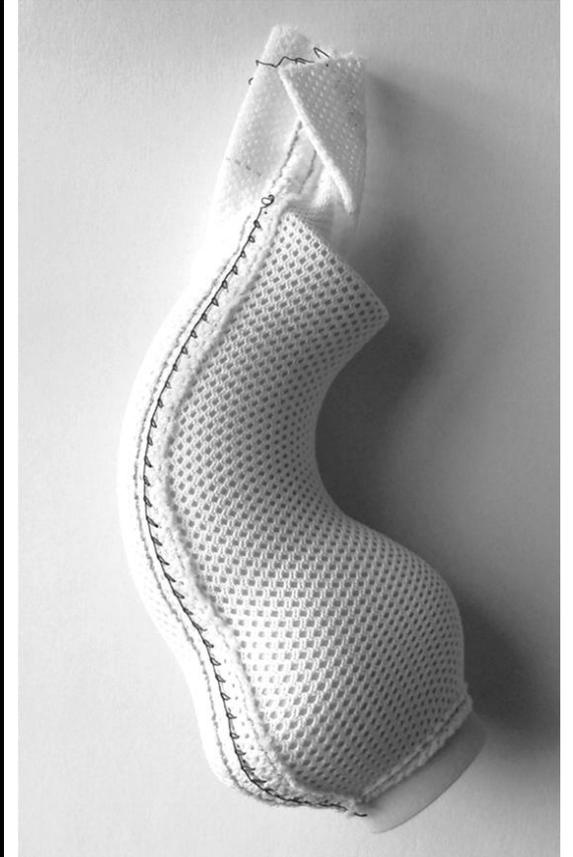
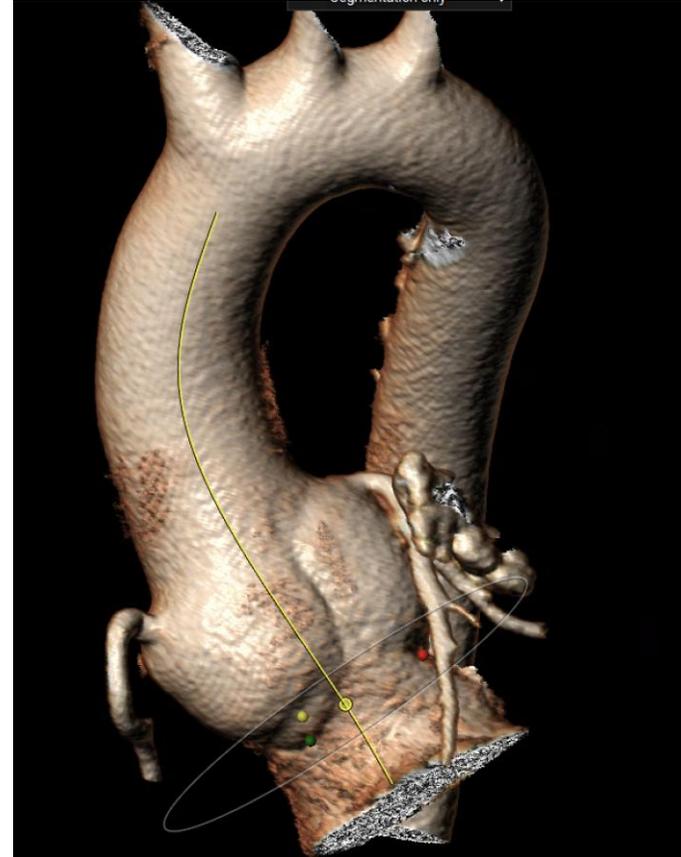
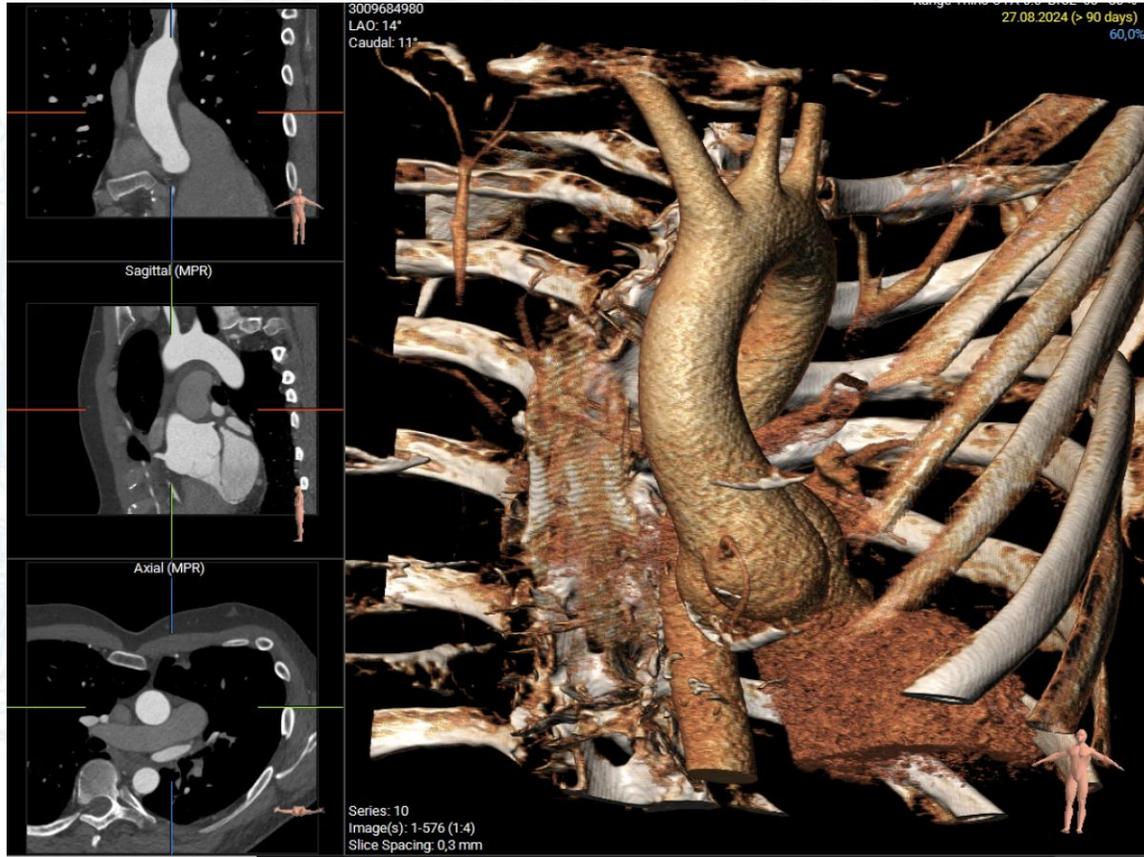


Muž, 74 let

2024 ECHO 50/52, CT 47/50 – stacionární nález



Posun k preventivní chirurgické léčbě - individualizované řešení

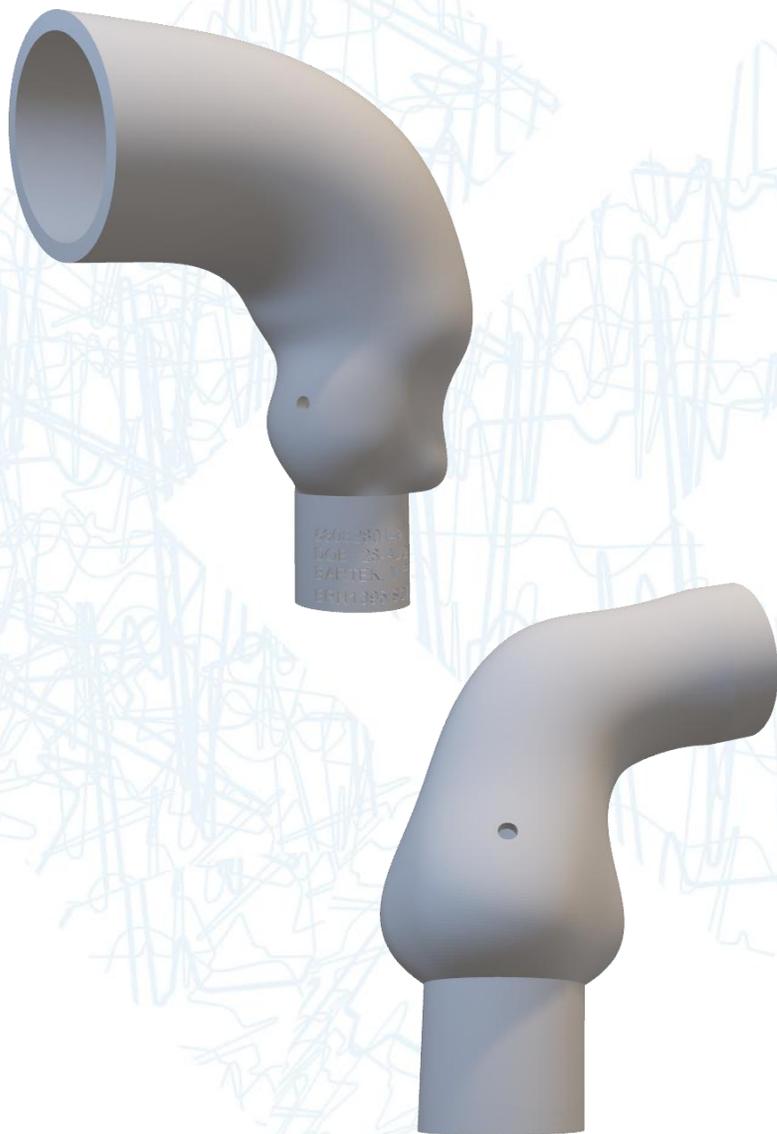


PEARS - myšlenka na individualizované řešení

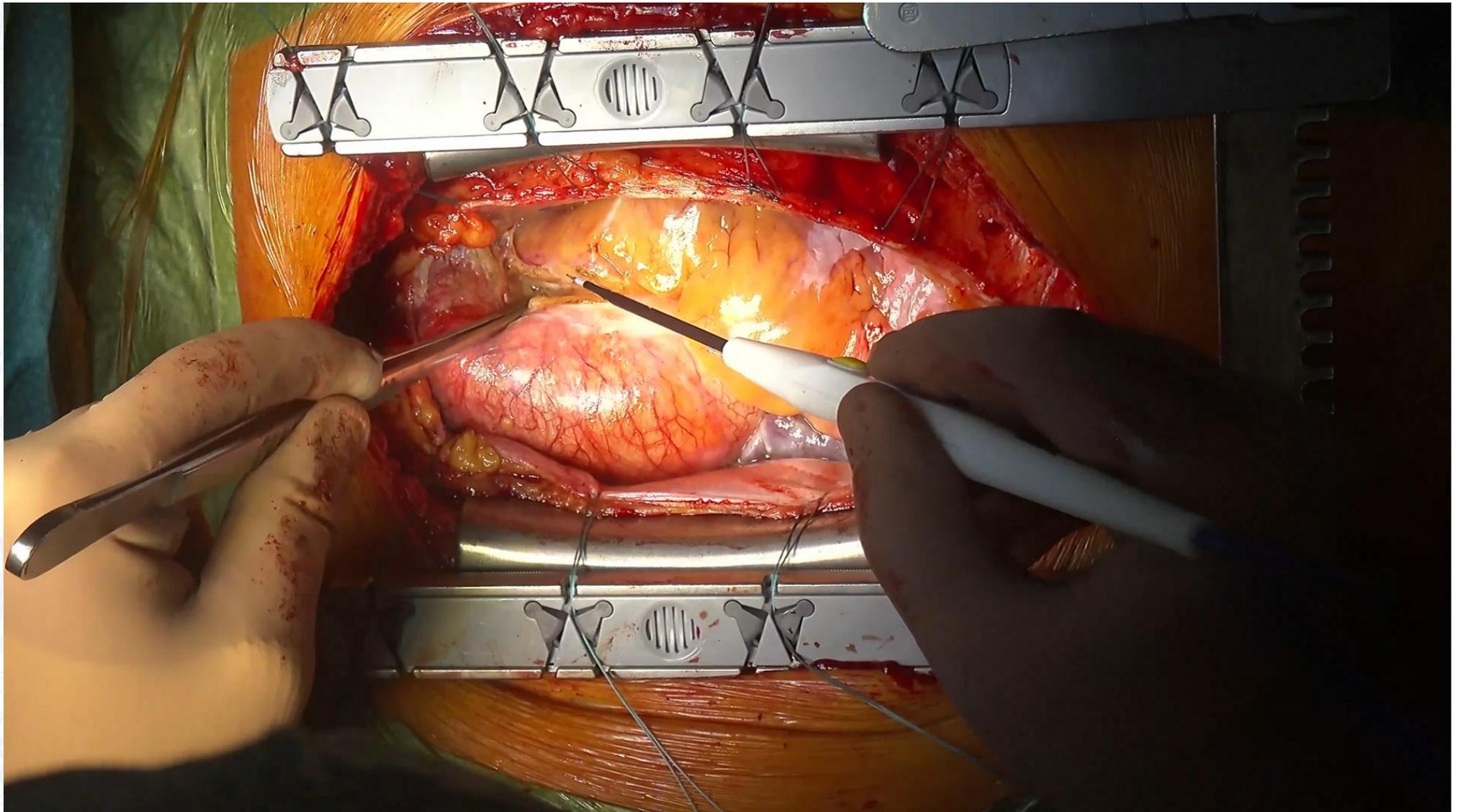
- PEARS - Personalised External Aortic Root Support
- polyesterová síťka kolem kořene a asc. aorty
- individualizace tvaru dle CT
- preventivní/kurativní výkon



Individualizované řešení

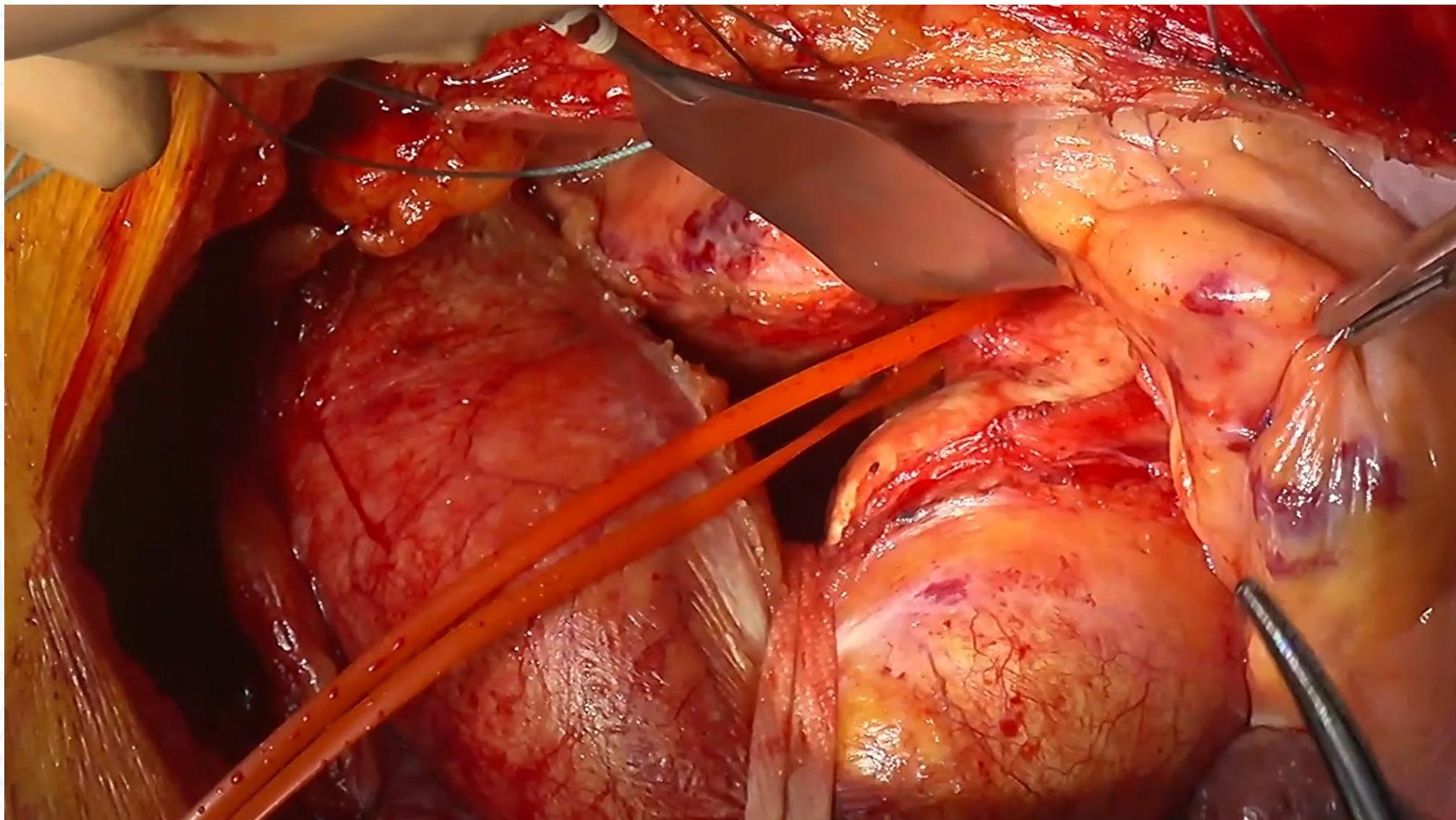


Implantace PEARS



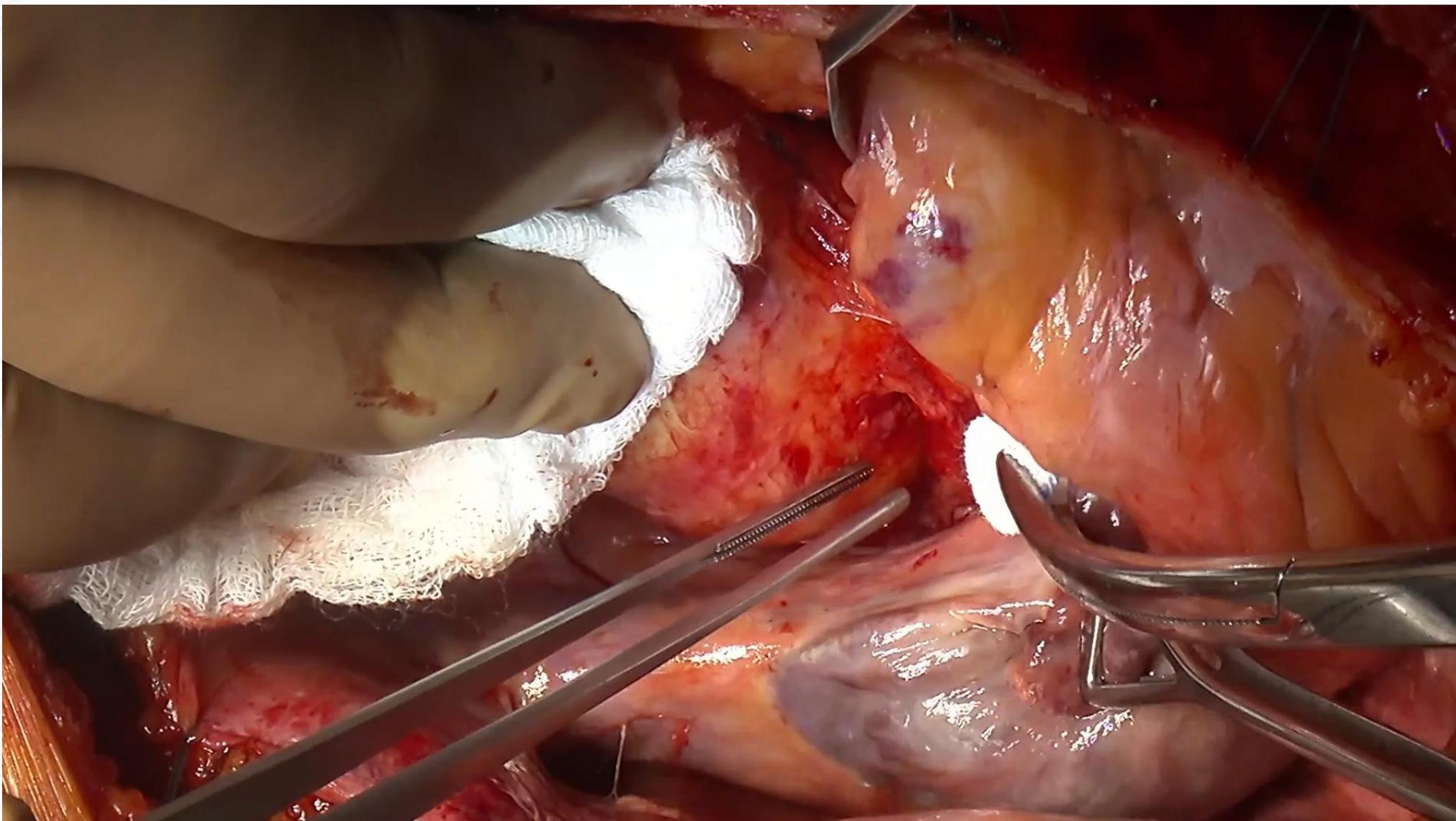
Implantace PEARS

kmen ACS
kmen ACD



Implantace PEARS

kmen ACD

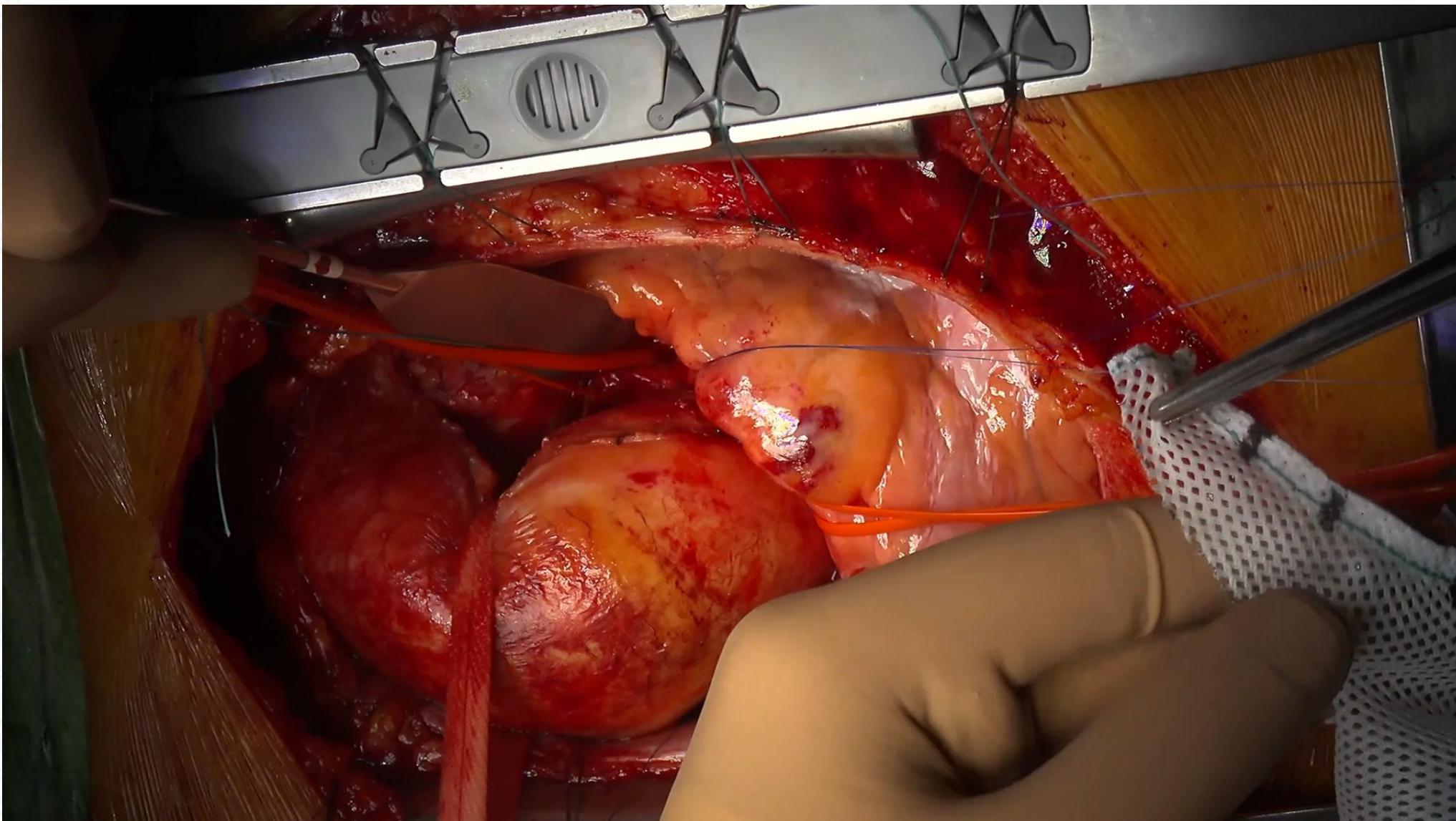


Implantace PEARS



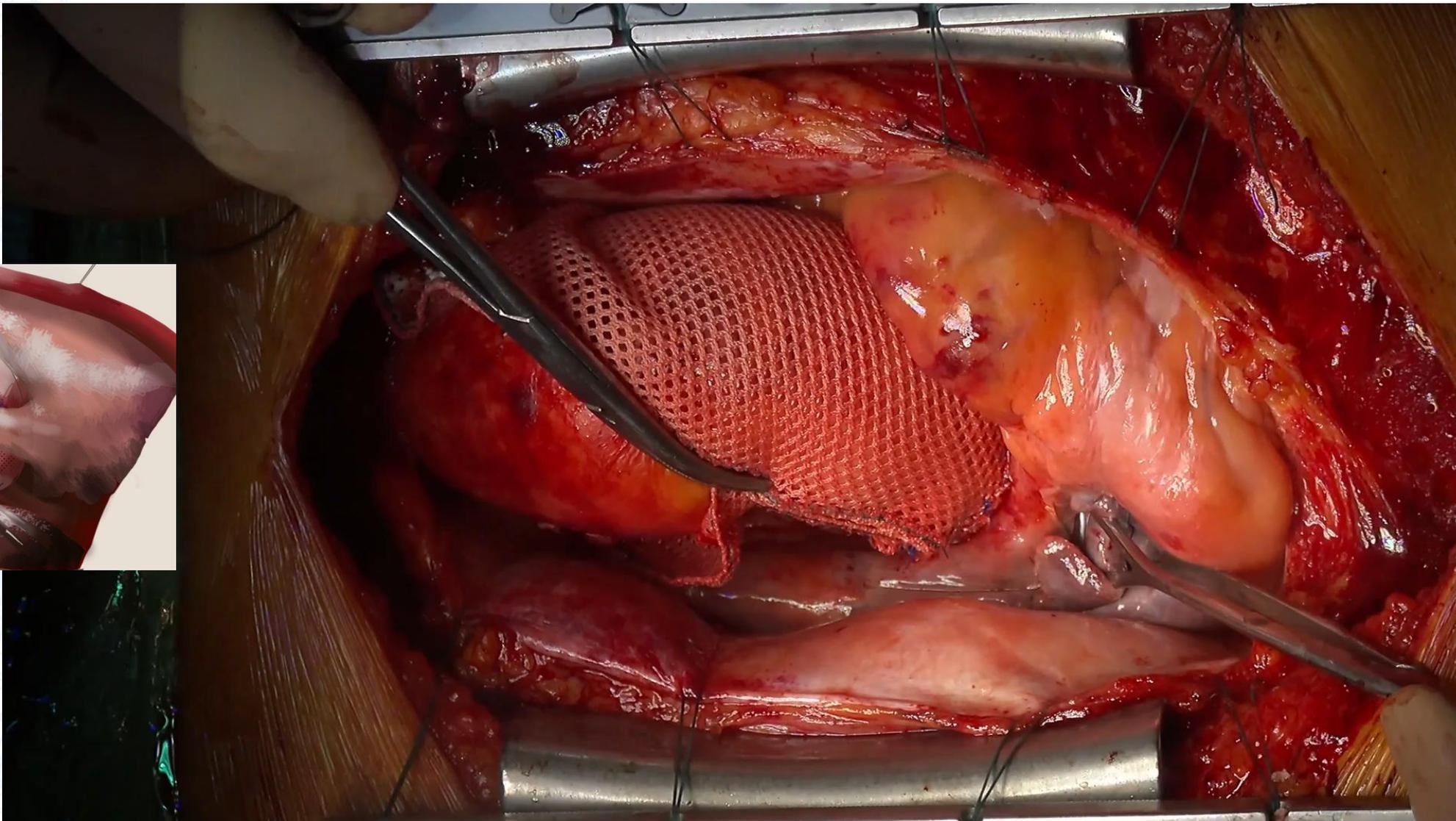
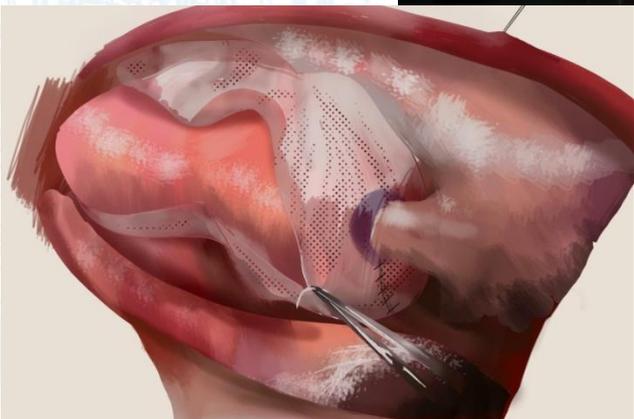
Implantace PEARS

Exovasc
umístění



Implantace PEARS

sutura švu



PEARS – celosvětový report

20. ledna 2026

n = 1622 (438 žen, 1184 mužů), 3-84 let

MFS, bikuspidní aortopatie, L-D sy, Turner sy, E-D sy, MYBCP3, ACTA2 mutace, TGA, Ross/PEARS

79% bez mimotělního oběhu

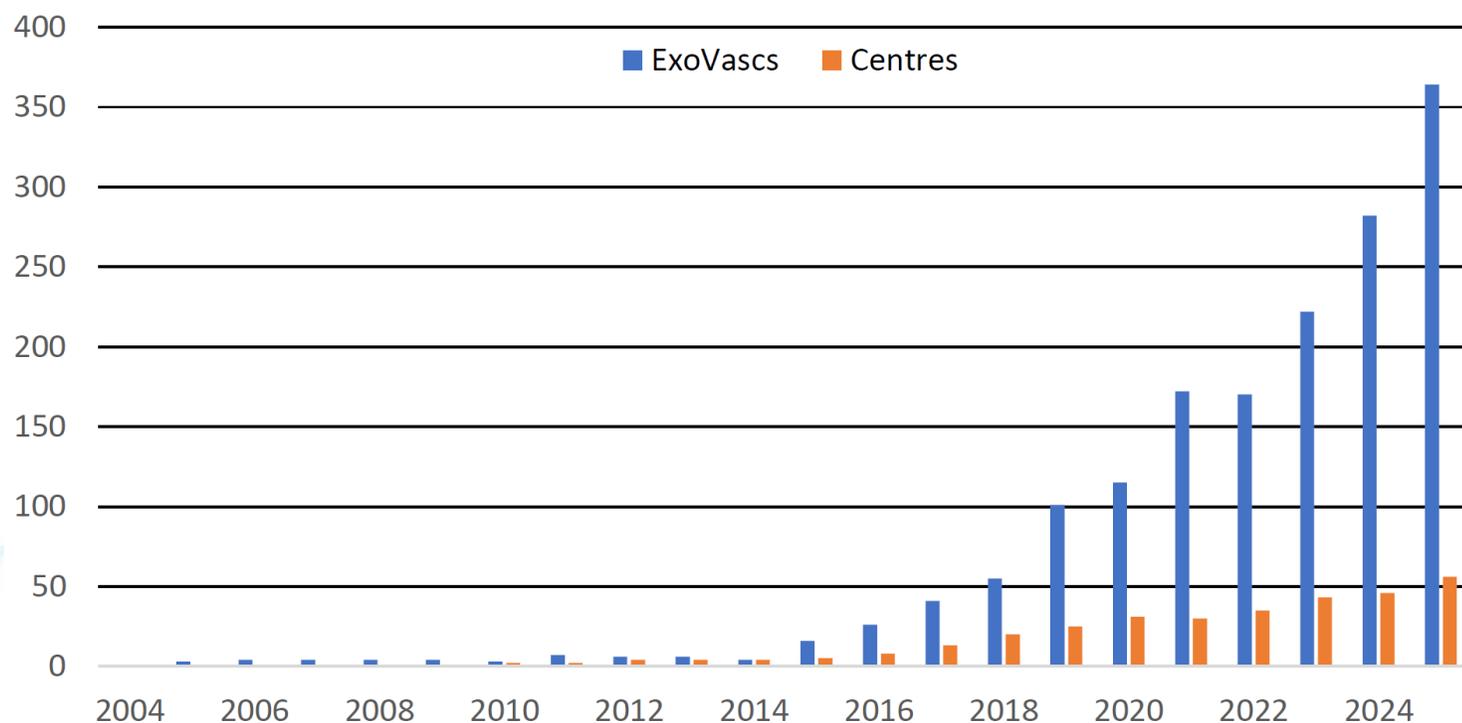
4 pacienti > 20 let

58 pacientů > 10 let

405 pacientů > 5 let

15 žen - 16 narozených dětí

bez akutní disekce (pokryté části) u implantovaných pacientů



Soubor CKTCH

03/2018-12/2025

108 implantací (11x Ross/PEARS)

22 žen; Ø věk: 50,3 (13-80let)

16x Marfanův syndrom

45x bikuspidní chlopeň

1x Turnerův syndrom

2x L-D syndrom

1x E-D syndrom

mutace MYBPC3, HYM11, ...

max. rozměr aorty (bulbus, AA) – Ø- 50,2mm (40-58)

8x +MVP

1x +TVP

5x +CABG

81% bez ECC

1x reoperace – progrese AoS – SAVR bez výkonu na aortě
bez akutní disekce



Shrnutí

Co zohledňovat

- fenotyp aorty - kořen x ascendentní
- geneticky podmíněné aortopatie
- **rozměr i délka ascendentní aorty**
- věk < 50 let

PEARS

- bez nutnosti ECC/bez zákroku na nativní chlopní
- bez antikoagulace
- zachovává endotel nativní aorty
- **prevence** fatální komplikace
- včasné řešení

