Kärlkirurgisk intervention vid torakal aortasjukdom

Artai Pirouzram
Kärlkirurg, Allmän kirurg
Överläkare
Kärlkirurgiska sektionen, Thorax-Kärl kliniken
Linköping

Regional utbildningsdag för Kardiolog-ST
210521

Guidelines förklaringar

Table 1. Levels of evidence.[1]

Level of Evidence A	Data derived from multiple randomized clinical trials or meta-analyses
Level of Evidence B	Data derived from a single randomized clinical trial or large non-randomized studies
Level of Evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, or registries

Table 2. Grades of strength of recommendations according to the ESC grading system.[1]

Classes of recommendation	Definition
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective. ***It should be performed***
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure
Class IIa	Weight of evidence/opinion is in favour of usefulness/efficacy. ***It should be considered***
Class IIb	Usefulness/efficacy is less well established by evidence/opinion. ***It may be considered***
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful. ***It is not recommended***

Evidensgrad?

Recommendation 2	Class	Level of evidence	References
Multidetector computed tomographic angiography from thoracic inlet to common femoral arteries should be considered as the first line diagnostic modality for descending thoracic aortic pathology	IIa	C	20,21

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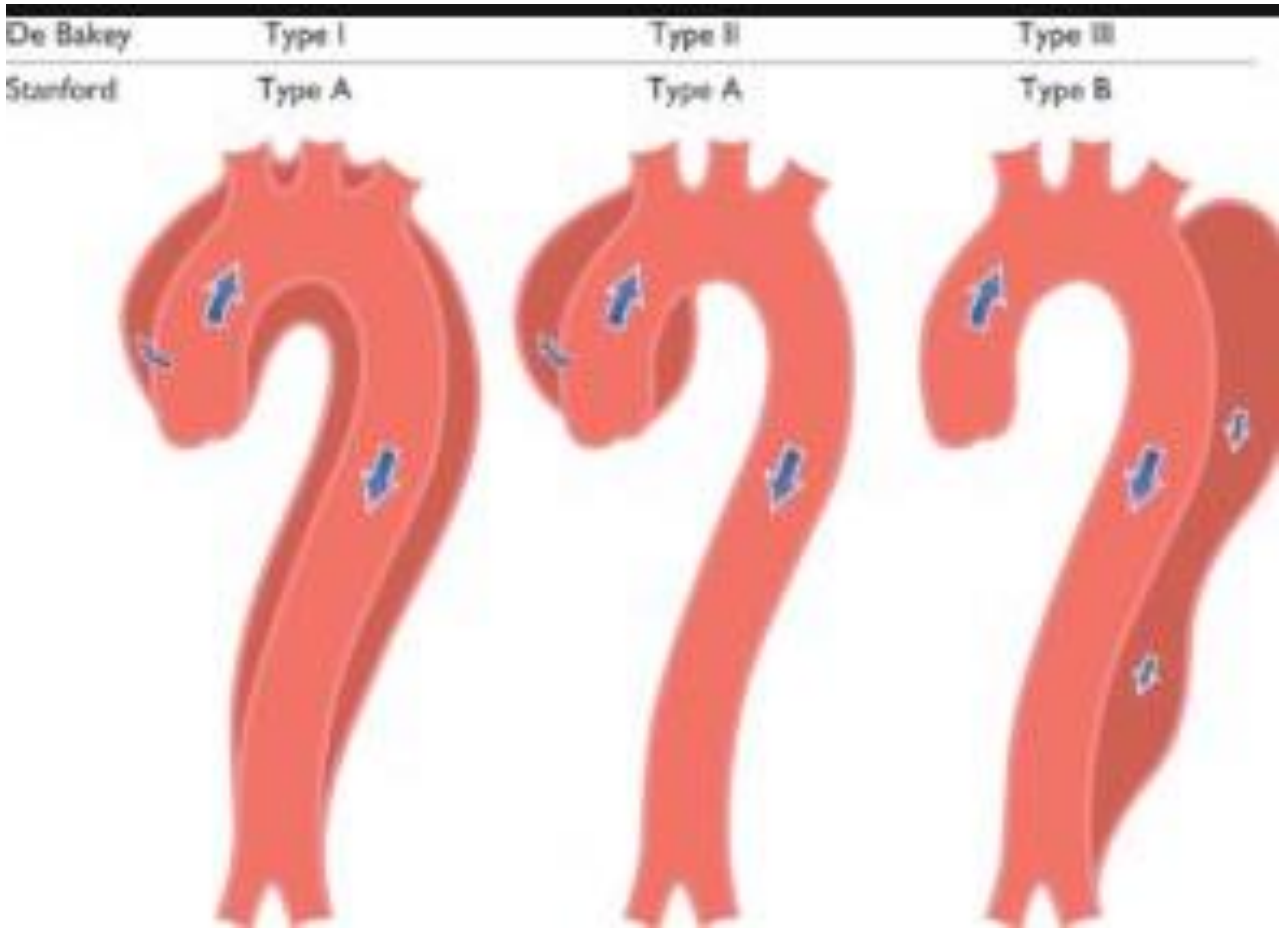
Akuta sjukdomar i torakal aorta

- Typ A dissektion
- Typ B dissektion
- Intramuralt hematom
- PAU (Paeri Aortic Ulcer)
- Aortaaneurysm

Aortadissektion



Behandlingsstrategi typ B dissektion

- Okomplicerad
- Komplicerad

Behandlingsstrategi typ B dissektion

- Okomplicerad → Konservativ behandling (BMT)
- Komplicerad → Intervention

ESVS Guidelines:
Okomplicerad Typ B dissektion

Recommendation 13	**Class**	**Level of evidence**
Medical therapy should always be part of the treatment of patients with acute type B dissection	I	C
Recommendation 14		
In patients with acute type B aortic dissection, β-blockers should be considered as the first line of medical therapy	IIa	C
Recommendation 15		
In patients with acute type B aortic dissection who do not respond or are intolerant of β-blockers, calcium channel antagonists and/or renin-angiotensin inhibitors may be considered as alternatives or complementaries	IIb	C

Komplicerad typ B dissektion

- ”In hospital mortality” vid komplicerad typ B-dissektion: 50%!

Komplicerad typ B dissektion

- ”In hospital mortality” vid komplicerad typ B-dissektion: 50%!

  - Snabb tillväxt

  -Ruptur, hypotension eller shock

  - Visceral/renal/extremitets ischemi

  -Paraplegi/parapares

  -Progredierande hematom i aortaväggen

  -Persisterande bröstsmärta

  -Persisterande högt blodtryck trots adekvat medicinering

Komplicerad typ B dissektion

- ”In hospital mortality” vid komplicerad typ B-dissektion: 50%!

- Snabb tillväxt

Väldefinierad inneliggande uppföljnings protokoll:

- Daglig avstämning med kärlkirurg

- Uppföljnings CT-protokoll: dag (1), 3, 7, 14, 30, 90

-Persisterande bröstsmärta

-Persisterande högt blodtryck trots adekvat medicinering

Vilka interventioner vid komplicerad typ B dissektion?

- Aortaruptur
- Snabb tillväxt av aortastorlek
- Svåra smärtor trots adekvat smärtlindring

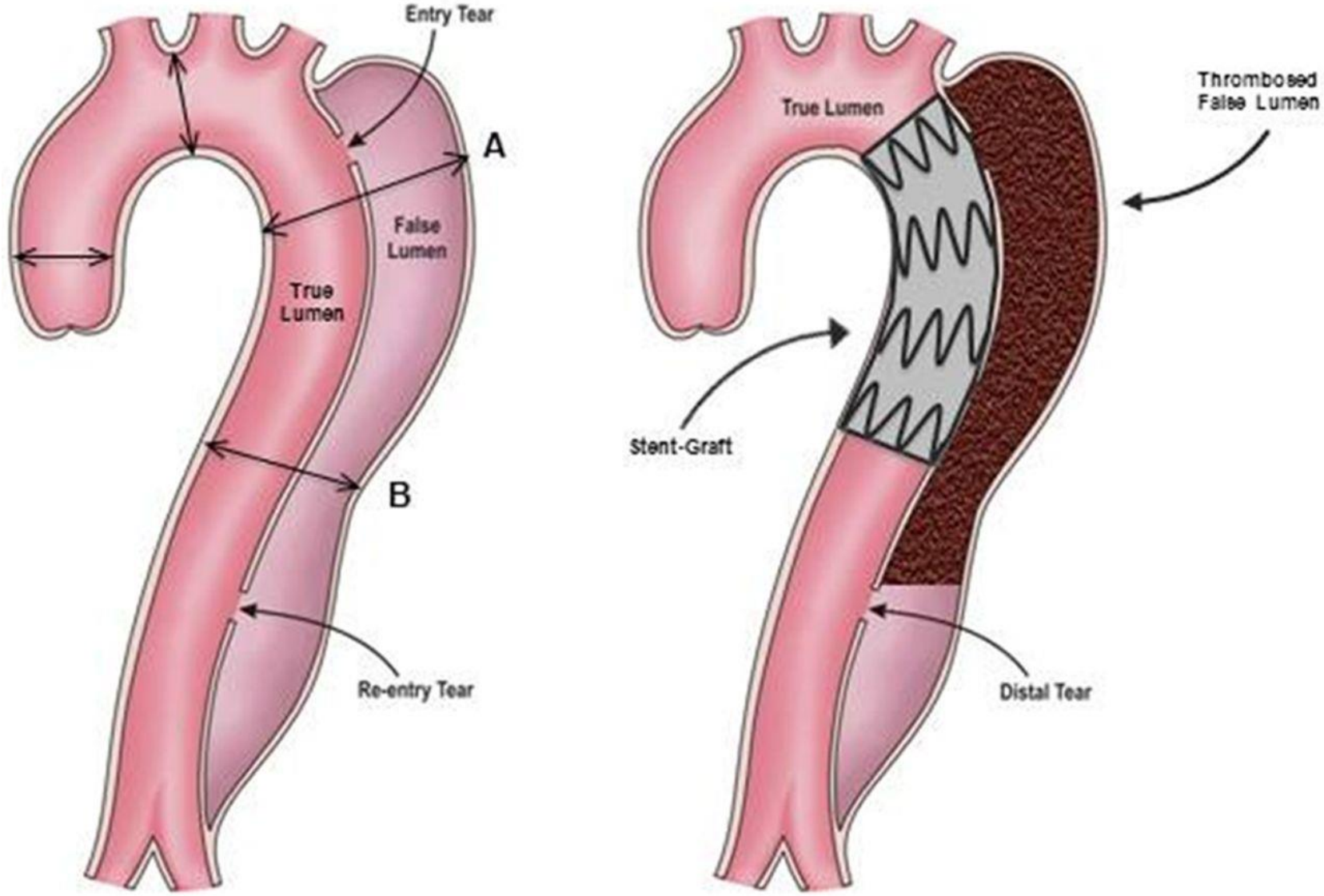
→ TEVAR

OBS! Protokoll för uppföljning!

- Grenkärlsischemi i buken → Flödesbevarande stentning
- Extremitetsischemi → Flödesbevarnde stentning/ Bypass

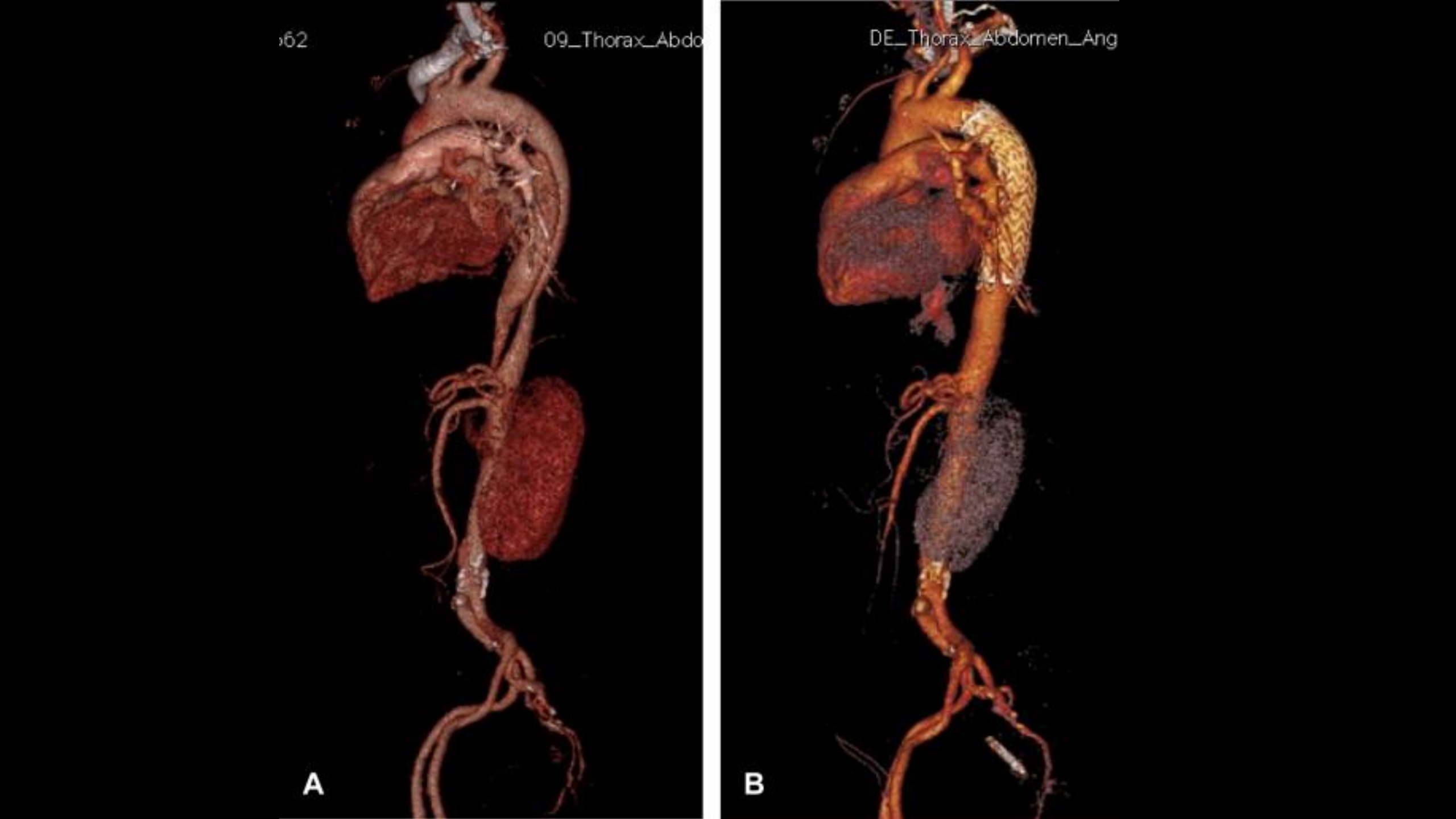
TEVAR: Thoracic EndoVascular Aortic Repair vid akut typ B-dissektion

- Syftar till att stänga det proximala entryt med ett stentgraft och därmed styra blodet till äkta lumen


Entry Tear
A
False Lumen
True Lumen
B
Re-entry Tear
True Lumen
Thrombosed False Lumen
Stent-Graft
Distal Tear

TEVAR: Thoracic EndoVascular Aortic Repair vid akut typ B-dissektion

- Syftar till att stänga det proximala entryt med ett stentgraft och därmed styra blodet till äkta lumen
- Trombotisering av falska lumen resulterar i att falska lumen skrumpnar och möjligen reducerar risken för tillväxt på sikt


09_Thorax_Abdo
DE_Thorax_Abdomen_Ang
A
B

TEVAR/ Öppen op

- Öppen operation (enstaka studier)
  - Sjukhusmortalitet: 40 – 50%

- TEVAR (tre metanalyser):
  - Sjukhusmortalitet: 2,6-9,8%
  - ”Clinical success”: 95-99%
  - Neurologisk komplikation: 0,6-3,1%

TEVAR is associated with mortality and stroke

- Risk of Mortality and Stroke **unchanged** during the recent years
  (n= 826 pat treated during 2013-2014)

From the Society for Vascular Surgery

Contemporary evaluation of mortality and stroke risk after thoracic endovascular aortic repair

Frances Y. Hu, BA,[a] Zachary B. Fang, BS,[a] Bradley G. Leshnower, MD,[b] Yazan Duwayri, MD,[a] William D. Jordan, MD,[a] Theresa W. Gillespie, PhD,[c] *and* Ravi K. Veeraswamy, MD,[d] *Atlanta, Ga; and Charleston, SC*

J vascular surgery. 2016

TEVAR vid komplicerad typ B diss

ESVS Guidelines

Recommendation 16	**Class**	**Level of evidence**
In patients with complicated acute type B aortic dissection, endovascular repair with thoracic endografting should be the first line intervention	I	C
Recommendation 17		
In complicated acute type B aortic dissection, endovascular fenestration should be considered to treat malperfusion	IIa	C
Recommendation 18		
To prevent aortic complications in uncomplicated acute type B aortic dissection, early thoracic endografting may be considered selectively	IIb	B

Naturalförloppet av kronisk typ B dissektion

- Akut fas: första två veckorna

10% av alla dödsfall
Väldigt skört membran
mellan falska/äkta lumen

- Subakut fas: efter två veckor och inom tre månader
  (Viss remodellering av aortavägg och membranet)

- Kronisk fas: efter tre månader

Naturalförloppet av kronisk typ B dissektion

- 25-50% av fallen får någon typ av aortakompl.
- 20-40% av fallen kräver åtgärd pga expansion

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- Prediktorer för tillväxt:
  - Hypertoni, KOL
  - Aortadiameter ≥ 40mm vid akuta insjuknandet
  - Stor rift (≥ 10 mm) på innerkruvan efter subclavia
  - Ingen trombotisering av falska lumen
  - Partiell trombotisering av falska lumen
  - Efter typ A åtgärd: öppensåtende falsk lumen med stor area (> 70 % av totala aortaarean)

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Evangelista et al.Circulation 2012;125(25):3133-41

Tsai TT et al N Engl J Med 2007;357(4):349-59

När ska man åtgärda kronisk typ B diss?

- Absoluta aortamåttet är viktigare än tillväxttakten: 20% av rupturer sker vid diameter 50-60 mm (flera referenser)

In patients with chronic aortic dissection, a descending thoracic aortic diameter between 56 and 59 mm may be considered as an indication for treatment in patients at reasonable surgical risk	IIb	C
Recommendation 34b		
In patients with chronic aortic dissection, a descending thoracic aortic diameter greater than 60 mm should be considered as an indication for treatment in patients at reasonable surgical risk	IIa	C
Recommendation 35		
In patients with chronic aortic dissection and thoraco-abdominal extension, an aortic diameter greater than 60 mm should be considered as an indication for treatment in patients at reasonable surgical risk	IIa	C

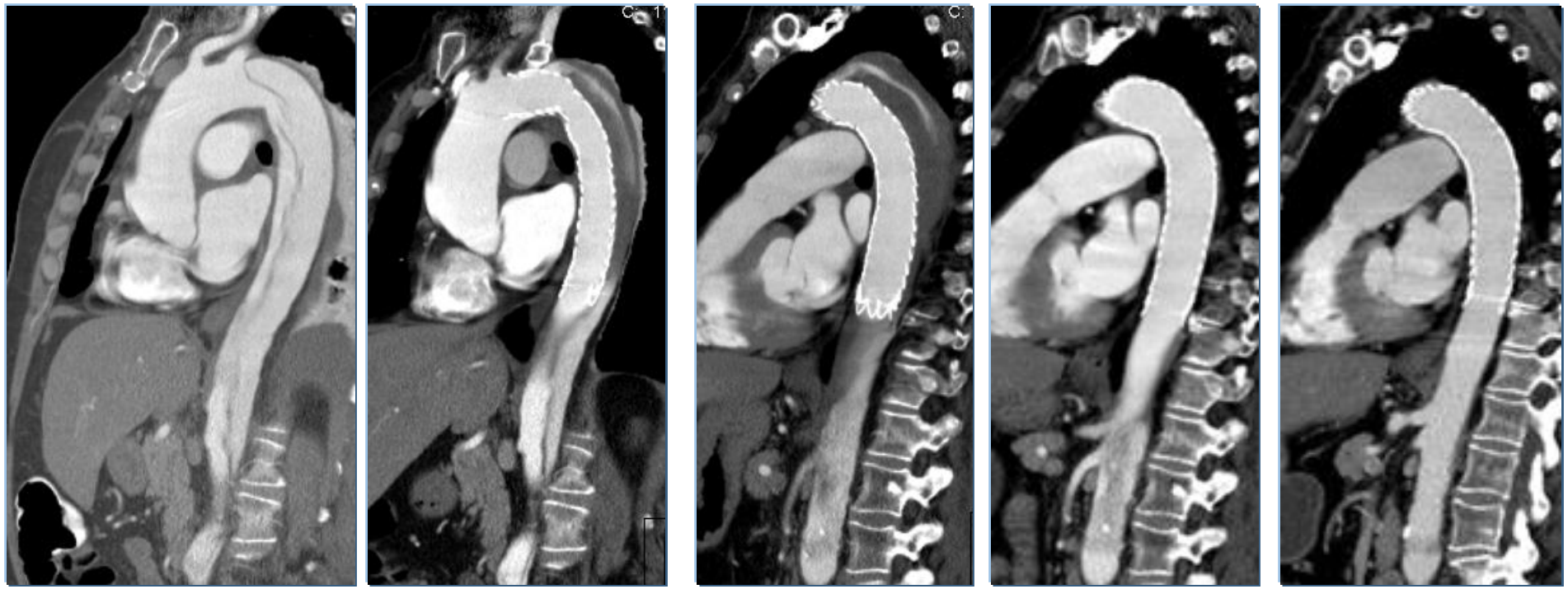
Vilka patienter med okomplicerad akut typ B dissektion har nytta av TEVAR?

Akut typ B dissektion – Studier

- ADSORB - RCT akuta dissektioner*
- INSTEAD – RCT subakuta - kroniska (≥14 dag-1 år)**
- IRAD – Register***

2014 Sep;48:285-91
Circ Cardiovasc Interv. 2013 Aug;6(4):407-16
Circulation. 2014 Sep 9;130(11 Suppl 1):S45-50

Remodulering av aorta efter tidig TEVAR



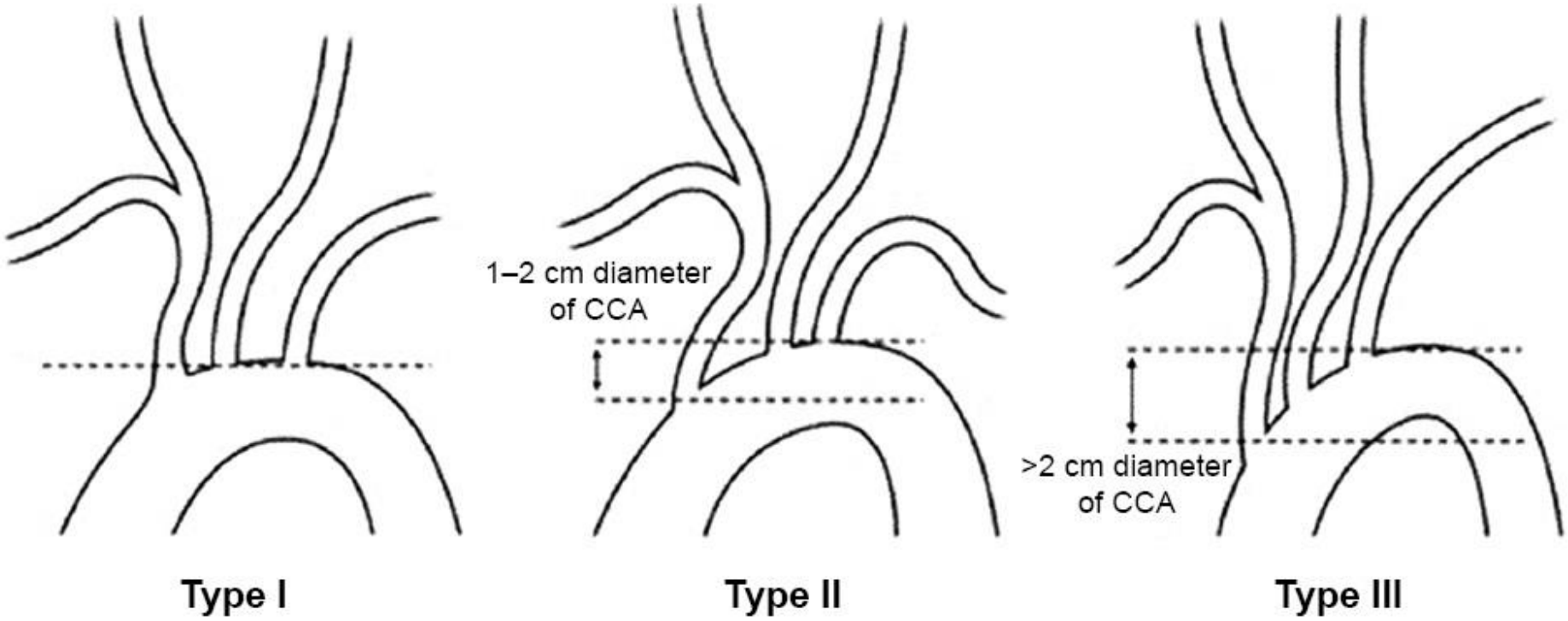
Preop 10 dag 3 mån 1 år 5 år

Tekniska utmaningar vid behandling av typ B dissktion

Tekniska utmaningar vid behandling av typ B dissktion

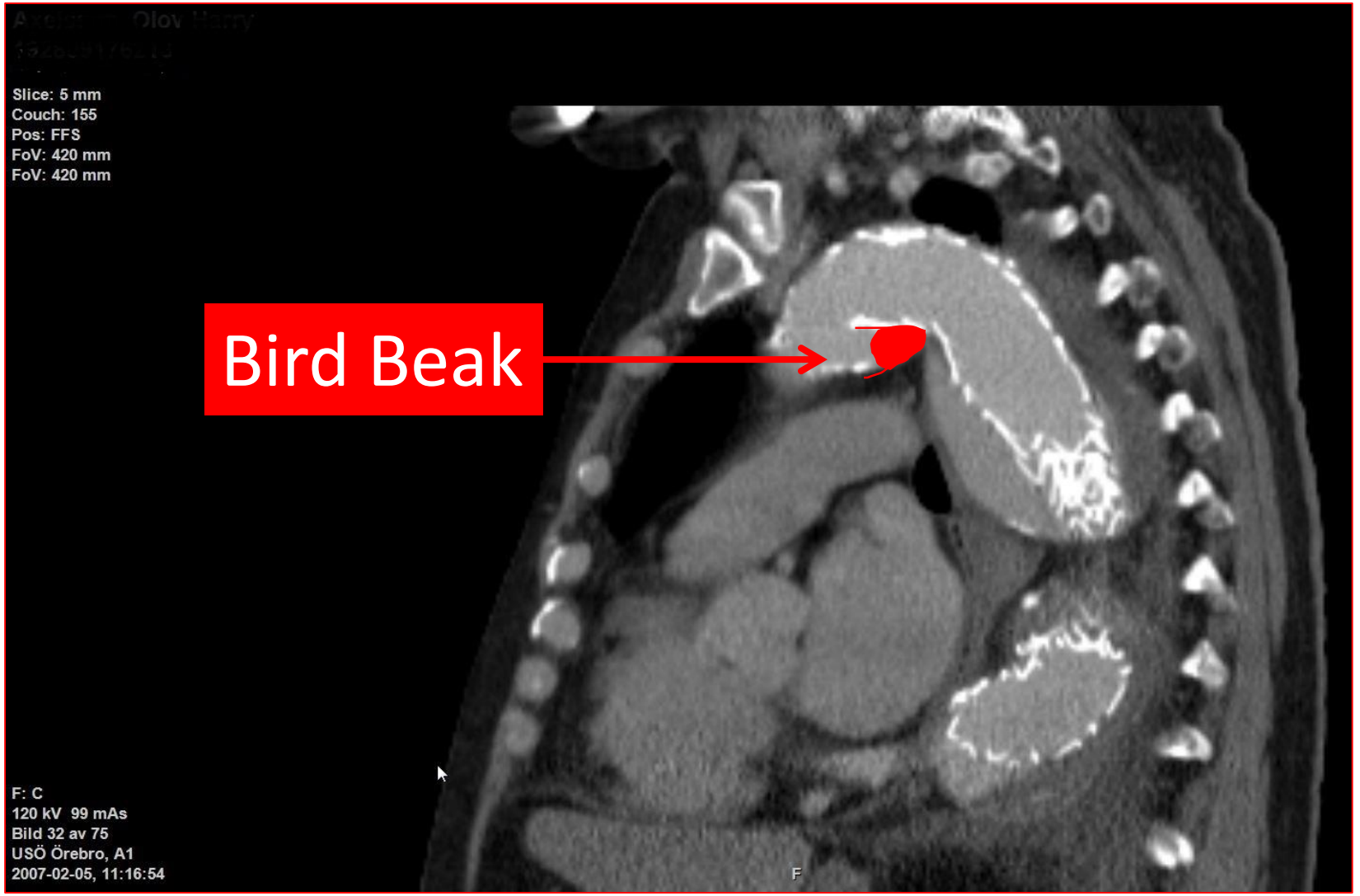
- Accesskärl: ca 8 mm i ilica/femoralis optimalt
- Proximalt landningsställe i descendens/arcus
- Kan man bevara vänster subclavia eller vänster carotis?
- Distal landnings zon (Truncus coeliacus avgång)
- Längd av täckning av aorta: Spinal ischemi!! (ThVIII – ThXII känsligast)

Landing in the arch



Conformability in the Arch

Conformability in the Arch



Att täcka väsnter subclavia vid TEVAR

J Endovasc Ther. 2002 Jun;9 Suppl 2:II39-43.

Initial experience with intentional stent-graft coverage of the subclavian artery during endovascular thoracic aortic repairs.

Görich J, Asquan Y, Seifarth H, Krämer S, Kapfer X, Orend KH, Sunder-Plassmann L, Pamler R.

Department of Radiology, University of Ulm, Germany. reinhard.pamler@medizin.uni-ulm.de

J Vasc Surg. 2007 Jan;45(1):90-4; discussion 94-5.

Coverage of the left subclavian artery during thoracic endovascular aortic repair.

Riesenman PJ, Farber MA, Mendes RR, Marston WA, Fulton JJ, Keagy BA.

Department of Surgery, Division of Vascular Surgery, University of North Carolina Hospitals, Chapel Hill, NC, USA.

Utility of left subclavian artery revascularization in association with endoluminal repair of acute and chronic thoracic aortic pathology

Brian G. Peterson, MD,[a] Mark K. Eskandari, MD, Thomas G. Gleason, MD, and Mark D. Morasch, MD, *Chicago, Ill*

(J Vasc Surg 2006;43:433-9.)

Results With a Selective Revascularization Strategy for Left Subclavian Artery Coverage During Thoracic Endovascular Aortic Repair

Teng C. Lee, MD, Nicholas D. Andersen, MD, Judson B. Williams, MD, Syamal D. Bhattacharya, MD, Richard L. McCann, MD, and G. Chad Hughes, MD

Department of Surgery, Duke University Medical Center, Durham, Nortl

(Ann Thorac Surg 2011;92:97–103)

Att täcka väsnter subclavia vid TEVAR

Left subclavian artery coverage during thoracic endovascular aortic aneurysm repair does not mandate revascularization

Thomas S. Maldonado, MD,[a] David Dexter, MD,[a] Caron B. Rockman, MD,[a] Frank J. Veith, MD,[a] Karan Garg, MD,[a] Frank Arko, MD,[b] Hernan Bertoni, MD,[c] Sharif Ellozy, MD,[d] William Jordan, MD,[e] and Edward Woo, MD,[f] *New York, NY; Dallas, Tex; Buenos Aires, Argentina; Birmingham, Ala; and Philadelphia, Pa*

J Vasc Surg 2013;57:116-24

-Retrospective 1 189 patients

-Conclusion: Selective revascularization

ESVS Guidelines om LSA revaskularisering

Recommendation 11	Class	Level of evidence	References
In elective thoracic endografting cases when it is planned to intentionally cover the left subclavian artery, in patients at risk of neurological complications, preventive left subclavian artery revascularisation should be considered	IIa	C	44

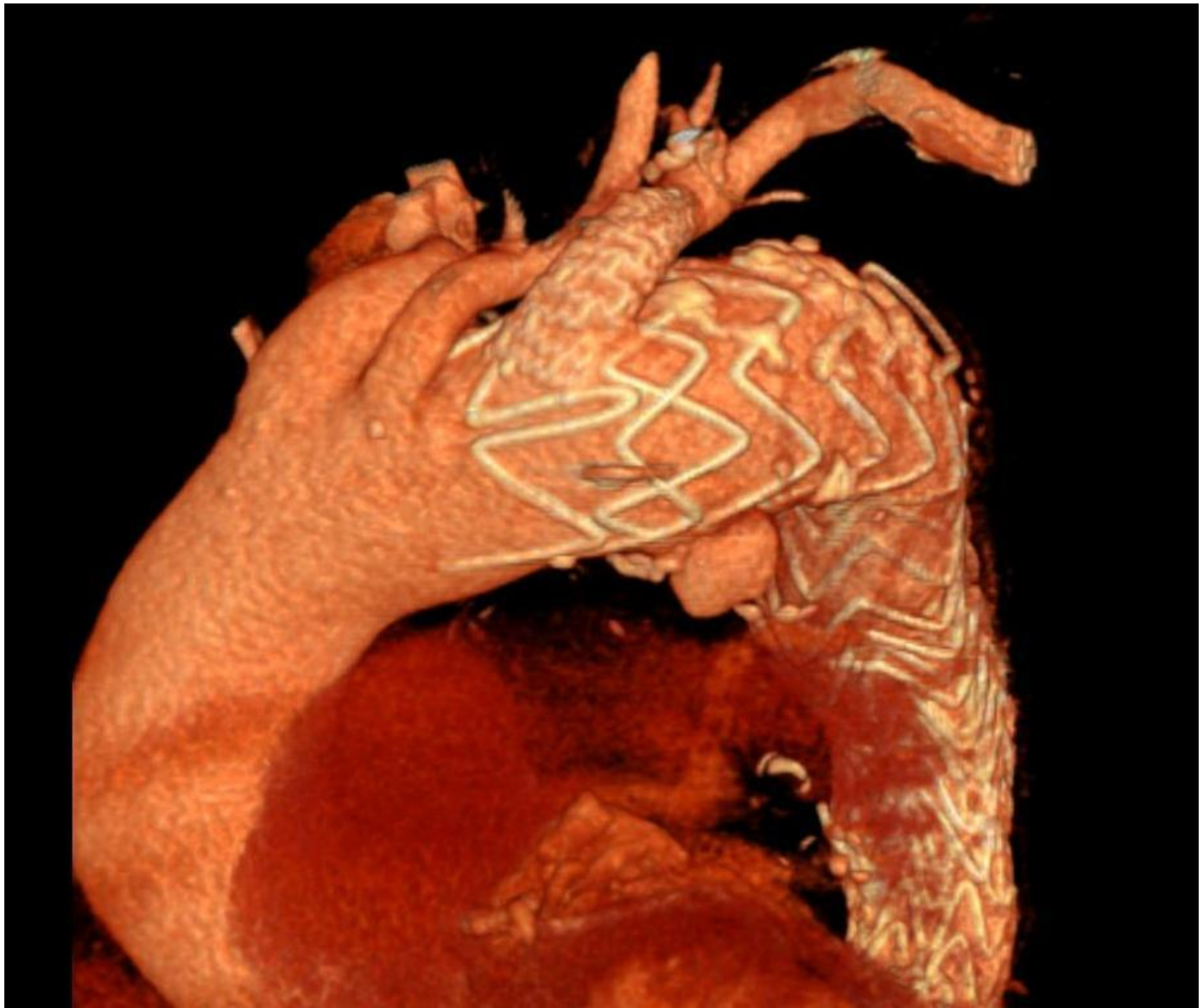
- Revascularisation should be considered in **elective** cases
- Revascularisation should be considered in **emergent** cases in patients at **high** risk:
  - Mammarian artery used in previous CABG
  - Dominant left vertebral artery

Täcka vänster Subclavia

- Elektiva fall:
  - Carotid-Subclavia bypass/transposition

- Akuta fall:
  - Hemmagjort fenestrerat graft
  - Chimney grafts

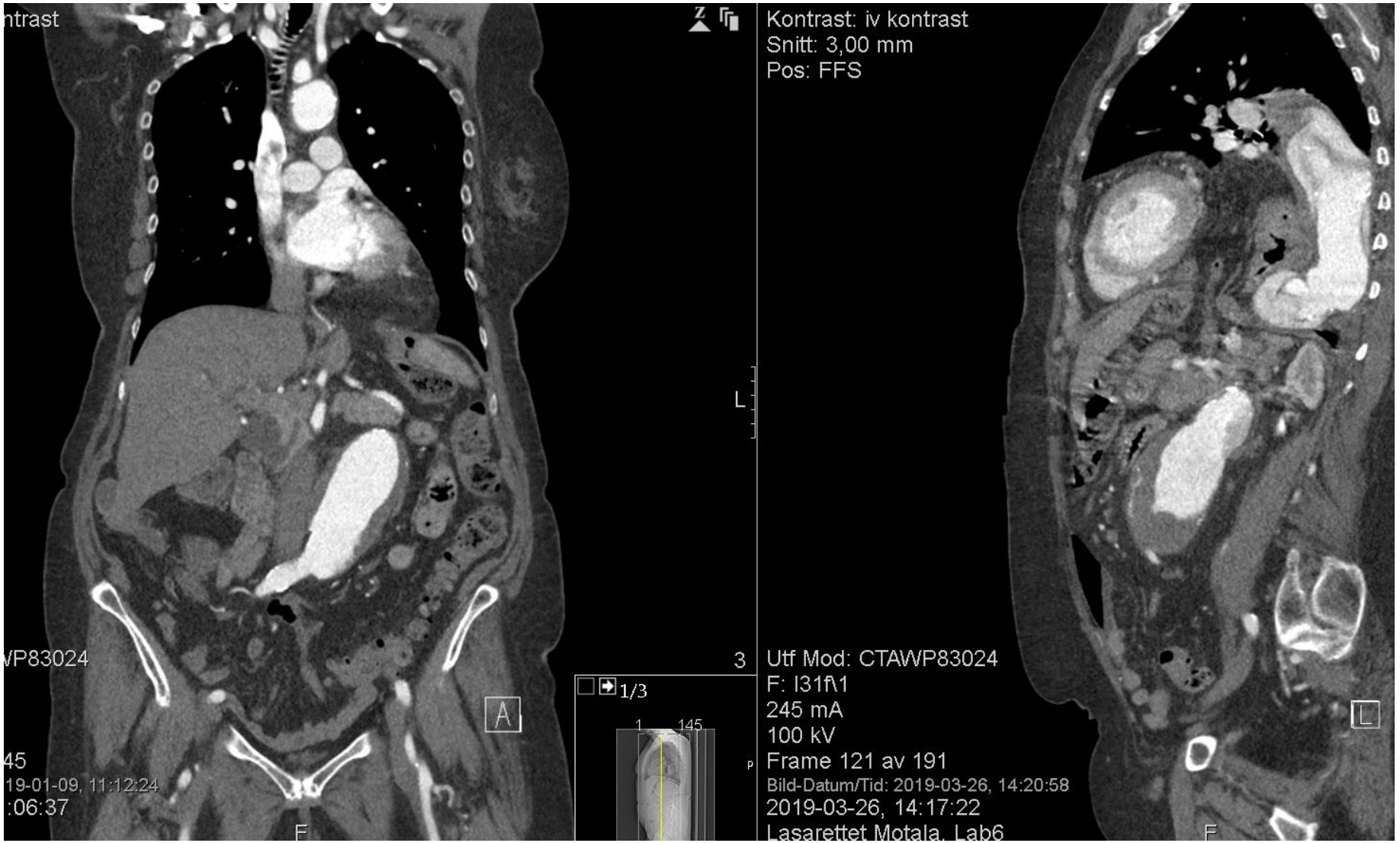
Chimney i vänster subclavia



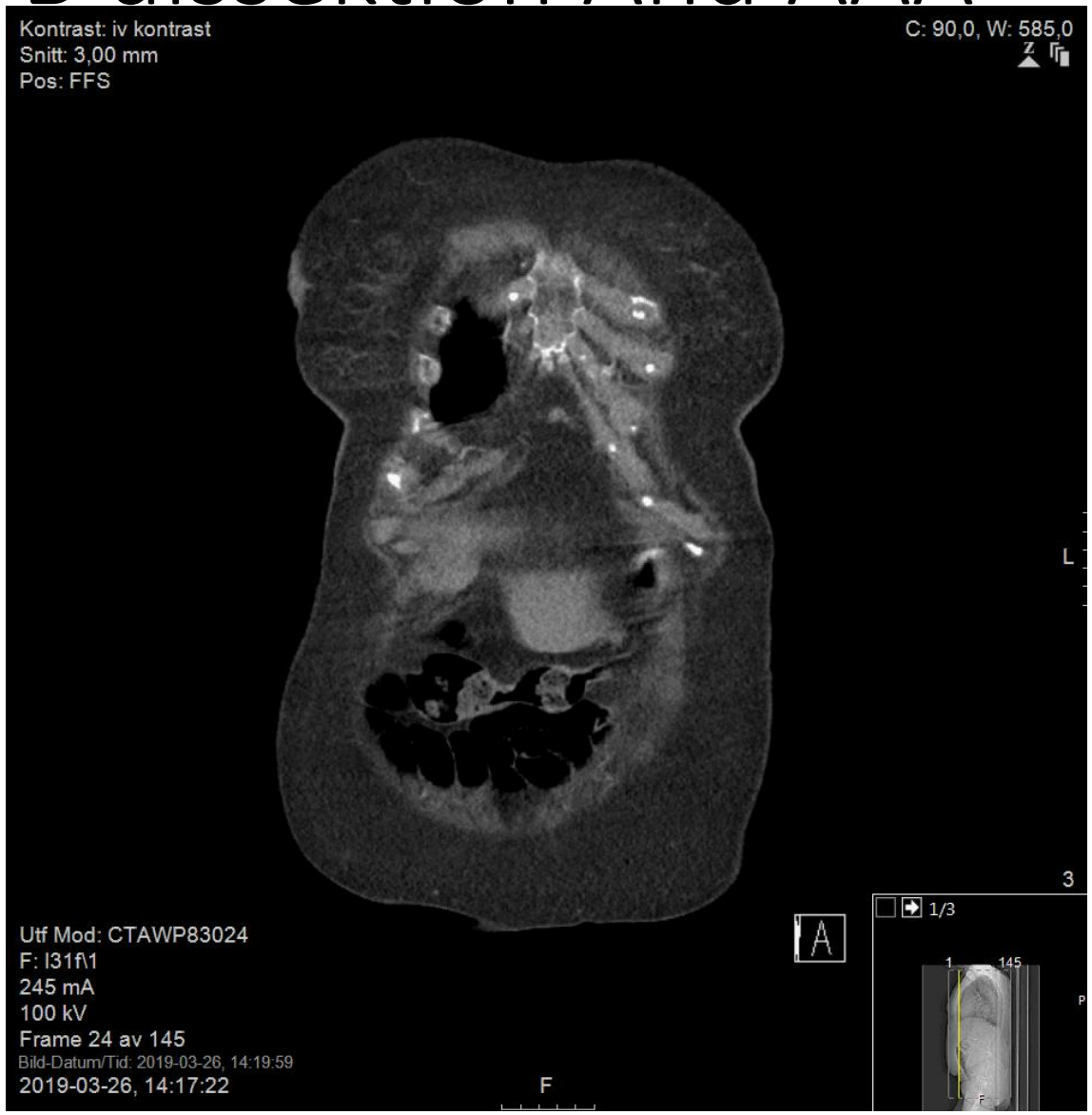
Utmaningar vid behandling av kronisk typ B dissektion

- Smal äkta lumen och vid falsk lumen
- Rigid membran
- Multipla entries/reentries
- Grenarna går från falska och äkta lumen
- Dissektionslängden kan vara omfattande
- Att hitta distal landningszon

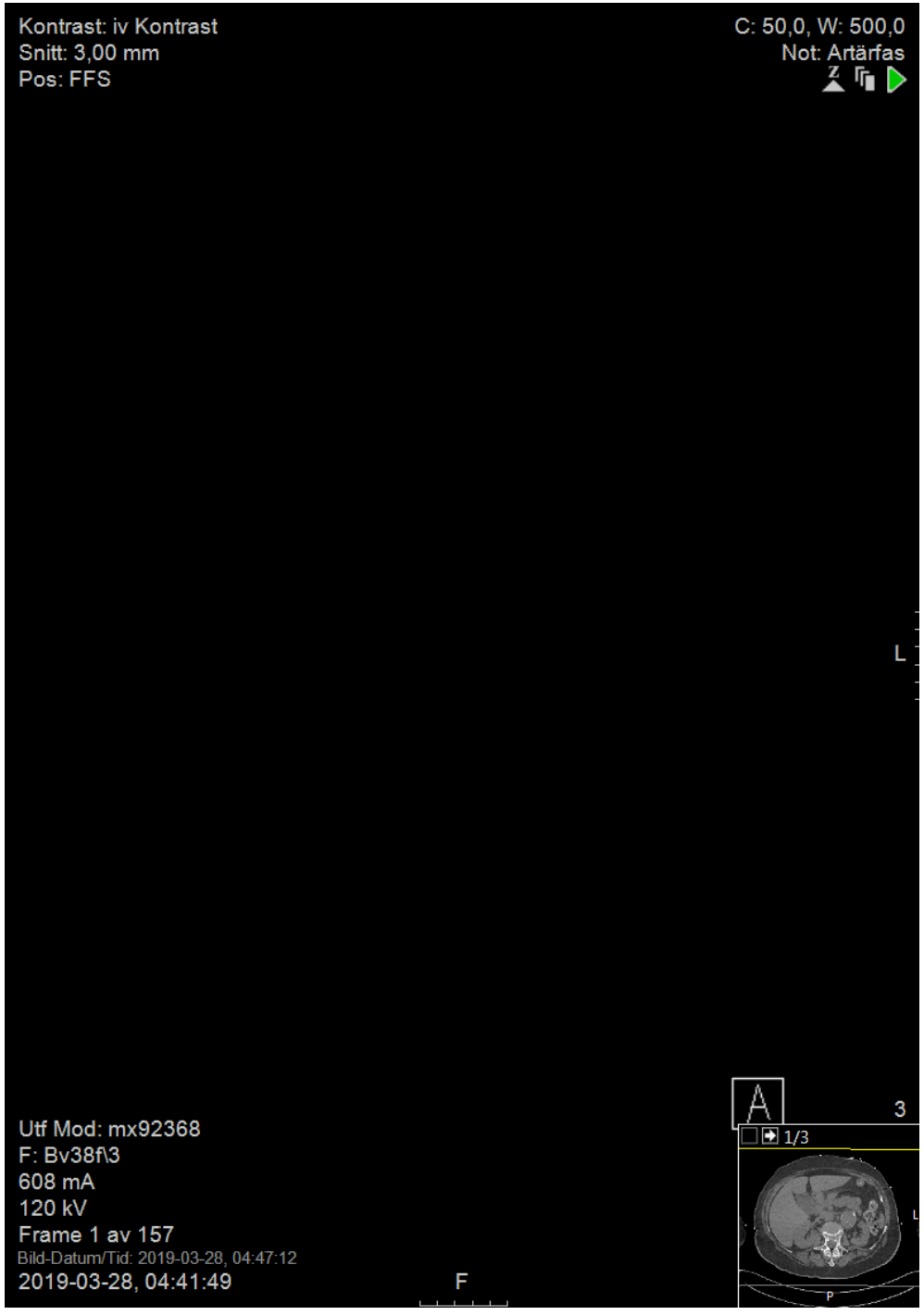
Acute Type B dissektion And AAA



Acute Type B dissektion And AAA



Two days later at the CCU


Kontrast: iv Kontrast
Snitt: 3,00 mm
Pos: FFS
C: 50,0, W: 500,0
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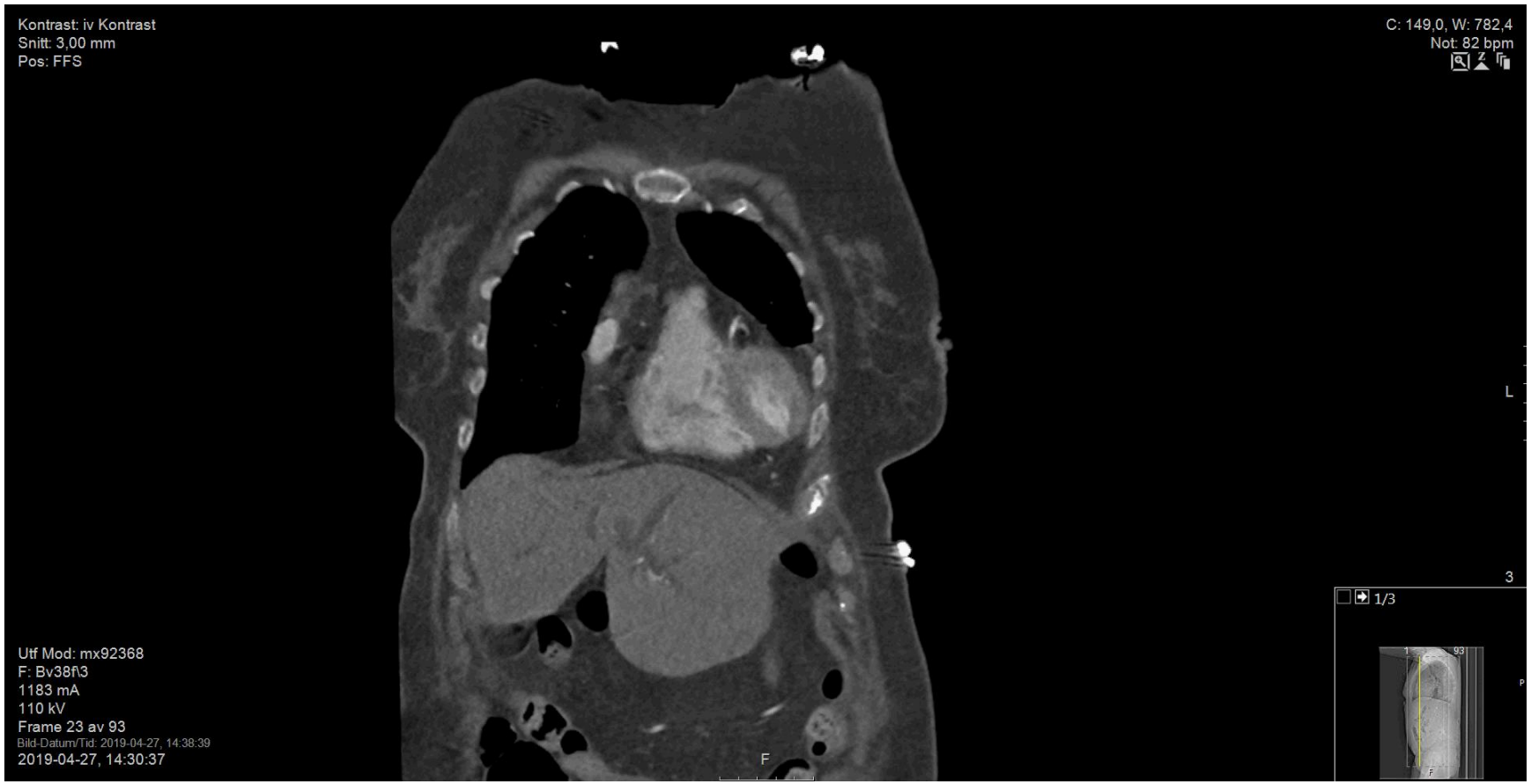
L
Utf Mod: mx92368
F: Bv38f\3
608 mA
120 kV
Frame 1 av 157
Bild-Datum/Tid: 2019-03-28, 04:47:12
2019-03-28, 04:41:49
F
A
3
1/3

- CPR to angiosuite
- C-TAG x2:
  - Hemodynamcially Stable
- Proceed with t-Branch to treat AAA

Postop 1 month

Postop 1 month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Not: 82 bpm
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1/3
Utf Mod: mx92368
F: Bv38f\3
1183 mA
110 kV
Frame 23 av 93
Bild-Datum/Tid: 2019-04-27, 14:38:39
2019-04-27, 14:30:37
F
P

Intramuralt hematom

Definition: Hematom i media utan tecken till intima ”tear” och avsaknad av falsk lumen

ESVS Guidelines

Recommendations on the management of intramural haematoma

Recommendations	Class[a]	Level[b]
In all patients with IMH, medical therapy including pain relief and blood pressure control is recommended.	I	C
In cases of Type A IMH, urgent surgery is indicated.	I	C
In cases of Type B IMH, initial medical therapy under careful surveillance is recommended.	I	C
In uncomplicated[c] Type B IMH, repetitive imaging (MRI or CT) is indicated.	I	C
In complicated[c] Type B IMH, TEVAR should be considered.	IIa	C
In complicated[c] Type B IMH, surgery may be considered.	IIb	C

Table 8 Predictors of intramural haematoma complications

Persistent and recurrent pain despite aggressive medical treatment[241]
Difficult blood pessure control[228]
Ascending aortic involvement[228, 237, 242]
Maximum aortic diameter ≥50 mm[178, 242]
Progressive maximum aortic wall thickness (>11 mm)[243]
Enlarging aortic diameter[243]
Recurrent pleural effusion[241]
Penetrating ulcer or ulcer-like projection secondary to localized dissections in the involved segment[241, 244-246]
Detection of organ ischaemia (brain, myocardium, bowels, kidneys, etc)

PAU: Penetrating Aoric Ulcer

- Definition: Ulceration av atelesklerotisk plack från media till intima

ESVS Guidelines

Recommendations on management of penetrating aortic ulcer

Recommendations	Class[a]	Level[b]
In all patients with PAU, medical therapy including pain relief and blood pressure control is recommended.	I	C
In the case of Type A PAU, surgery should be considered.	IIa	C
In the case of Type B PAU, initial medical therapy under careful surveillance is recommended.	I	C
In uncomplicated Type B PAU, repetitive imaging (MRI or CT) is indicated.	I	C
In complicated Type B PAU, TEVAR should be considered.	IIa	C
In complicated Type B PAU, surgery may be considered.	IIb	C

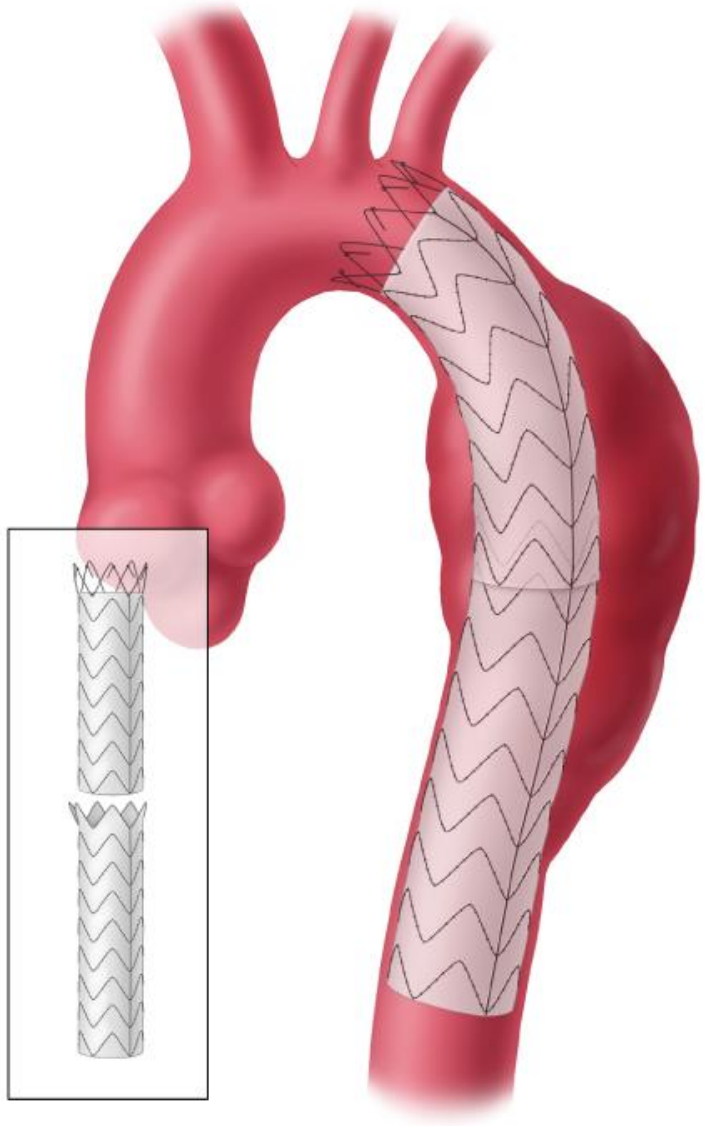
Aortaaneurysm i aorta descendens

Aortaaneurysm i aorta descendens

Tröskelstorlek för förebyggande åtgärd:

- Män: 60mm
- Kvinnor 55mm

TEVAR: Thoracic EndoVascular Aortic Repair



Aneurysm som innefattar halskärlen

- Elektiva fall:
  - Öppen arcus reonstruktion följt av ev. TEVAR

- Akuta fall:
  - Endovaskulär rekonstruktion:
    - Hemmagjort fenestrerat graft
    - Chimney graft

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Alla elektiva fall handläggs multidiciplinärt inom ”Aneurysmrond”

Kärlkirurg, thoraxkirurg, kardiolog, radiolog och fysiolog

?