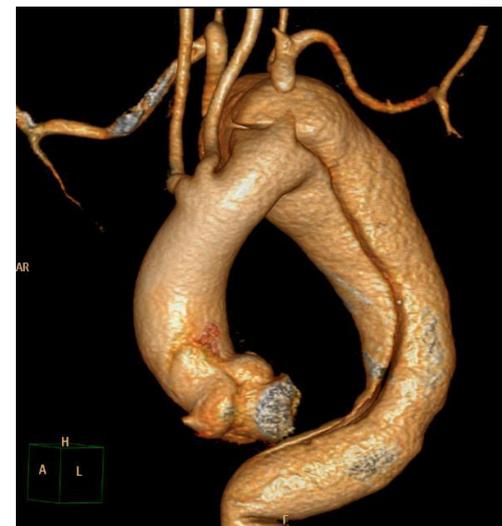




Aktuálne odporúčania pre diagnostiku a liečbu ochorení descendentnej aorty

Juraj Maďarič

Klinika kardiológie a angiológie NÚSCH



2010 ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the Diagnosis and Management of Patients With Thoracic Aortic Disease: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, American Association for Thoracic Surgery, American College of Radiology, American Stroke Association, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of Thoracic Surgeons, and Society for Vascular Medicine

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STATE-OF-THE-ART PAPER

Interdisciplinary Expert Consensus Document on Management of Type B Aortic Dissection

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European Heart Journal (2012) 33, 1558–1603
doi:10.1093/eurheartj/ehs074

POSITION STATEMENT

Thoracic Endovascular Aortic Repair (TEVAR) for the treatment of aortic diseases: a position statement from the European Association for Cardio-Thoracic Surgery (EACTS) and the European Society of Cardiology (ESC), in collaboration with the European Association of Percutaneous Cardiovascular Interventions (EAPCI)†

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Martin Czerny^{5*}, Holger Eggebrecht⁶, Arturo Evangelista⁷, Rossella Fattori⁸,
Heinz Jakob⁹, Lars Lönn¹⁰, Christoph A. Nienaber¹¹, Guido Rocchi¹²,
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European Heart Journal Advance Access published August 29, 2014



European Heart Journal
doi:10.1093/eurheartj/ehu281

ESC GUIDELINES

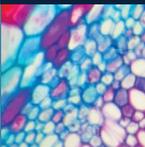
2014 ESC Guidelines on the diagnosis and treatment of aortic diseases

Document covering acute and chronic aortic diseases of the thoracic
and abdominal aorta of the adult

The Task Force for the Diagnosis and Treatment of Aortic Diseases
of the European Society of Cardiology (ESC)

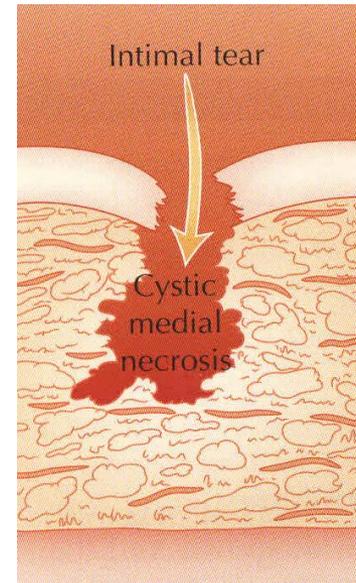
Ochorenia descendentnej hrudnej aorty

- **Akútne aortálne syndrómy**
 - Aortálna disekcia
 - Intramurálny hematóm (IMH)
 - Penetrujúci aterosklerotický ulkus (PAU)
 - Rýchlo expandujúca Ao aneuryzma
 - Traumatická aortálna transekcia (deceleračné zranenia)
- **Aortálne aneuryzmy**
- **Genetické ochorenia postihujúce aortu**
 - Koarktácia aorty
- **Aterosklerotické lézie aorty**
- **Aortitídy** (veľkobunková arteritída, Takayasu arteritída)
- **Ao tumory**

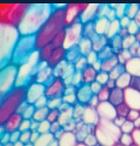
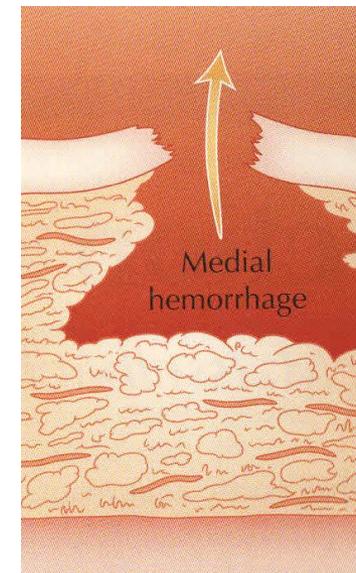


Patogenéza Ao disekcie

- **Primárne narušenie intimy**
nasledované disekciou – **vniknutím krvi do média** s propagáciou väčšinou antegrádne – prenos aortálneho tlaku do narušenej média, separácia vrstiev aortálnej steny, progresie disekcie



- **Primárne ruptúra vasa vasorum s hemorágiou do aortálnej média**
sekundárne narušenie intimy a komunikácia s Ao lumenom;
bez narušenia intimy – **intramurálny hematóm**;



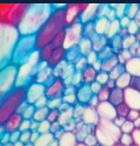
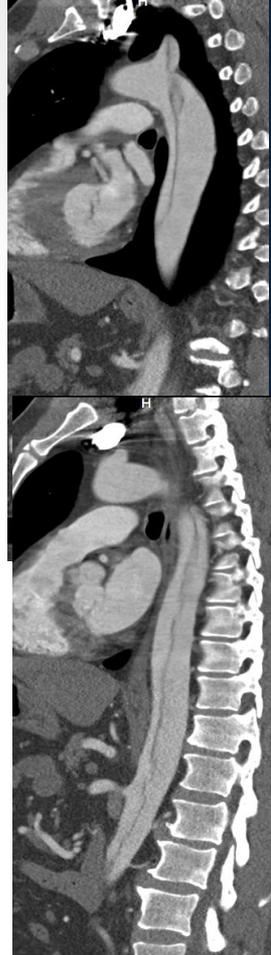
Epidemiológia Ao disekcie

- **Incidenca:** 10-30/mil. obyvateľov/rok (2/3 typ A, 1/3 typ B)
- **Mortalita:** 1-2% za každú hodinu počas prvých 24 hod
- **In-hospitalizačná mortalita:** 27%
- Šanca na prežitie pri adekvátnom manažmente 74-92%

• *Hirst AE Jr, et al. Medicine 1958*

• *Hagan PG, et al. JAMA 2000*

➤ **Diagnostika a liečba sú emergentné**



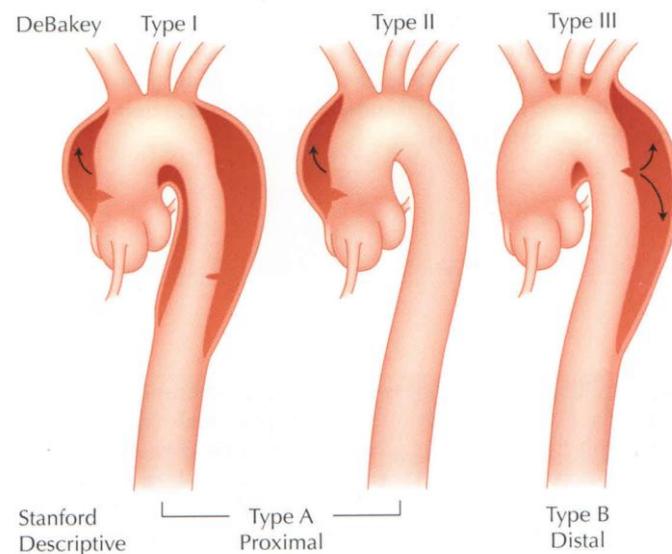
Klasifikácia

Podľa dĺžky trvania

Typ	Časový interval od začiatku príznakov
Akútna	< 2 týždne
Subakútna	15-90 dní (2-6 týždňov)
Chronická	> 90 dní (>6 týždňov)

Podľa rozsahu Ao postihnutia

DeBakey	Stanford	Výskyt
Typ I	Typ A	70%
Typ II		
Typ III	Typ B	30%

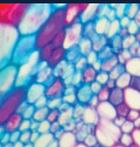
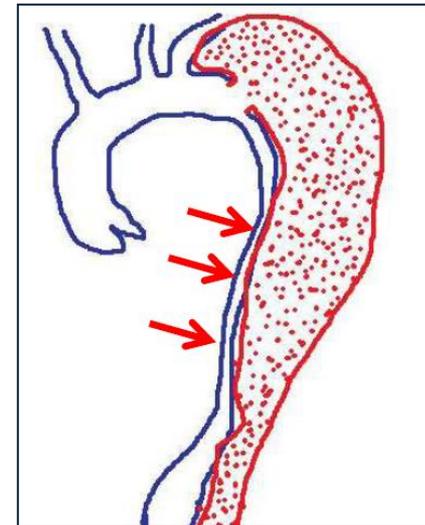
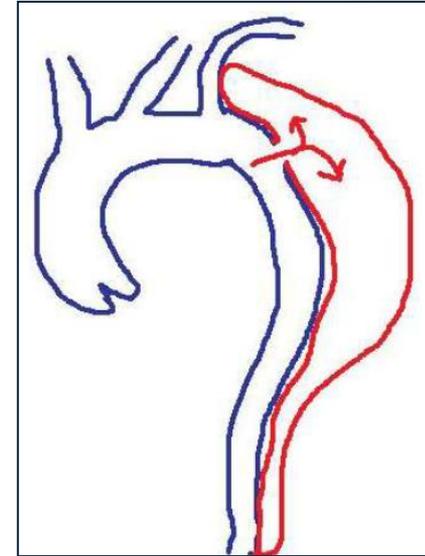


Aortálna disekcia typ B

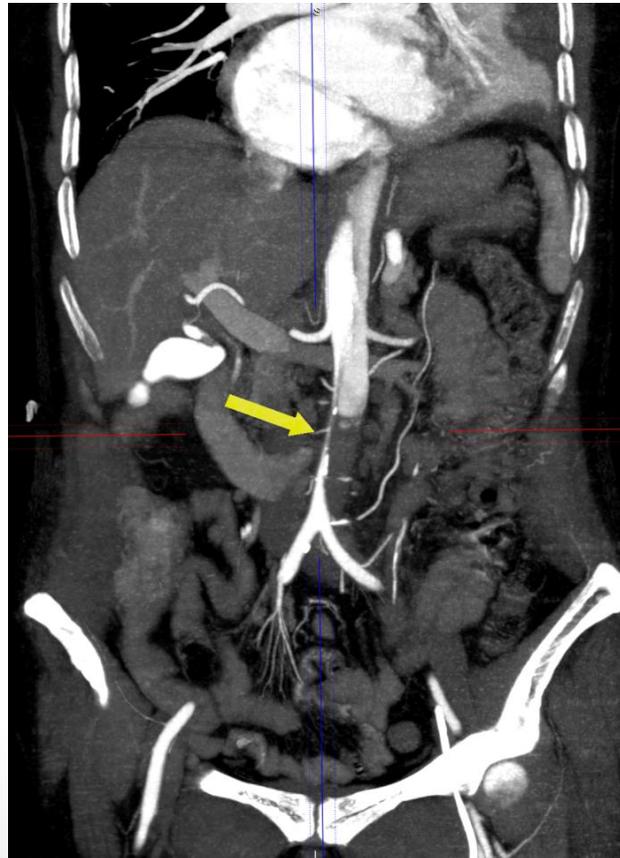
- **Separácia aorty na dva priestory krvného toku – pravý a falošný lumen oddelené arteriálnom flapom**

- prietok vo FL môže komprimovať PL a tým kompromitovať perfúziu orgánov
- komunikácia PL a FL (re-entry) môže rezultovať do aneuryzmatickej degenerácie aorty s následným rizikom ruptúry (hoci môže zabezpečovať nevyhnutnú perfúziu)

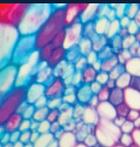
- Cca. 30-45% pacientov s akútnou disekciou typu B je komplikovaných periférnou vaskulárnou ischémiou alebo hemodynamickou instabilitou – potreba intervencie



Aortálna disekcia typ B – možný klinický priebeh



- dilatácia aorty
- kompresia pravého lúmenu
- oklúzia viscerálnych artérií s end-orgánovou ischémiou
- oklúzia pelvických artérií s periférnou ischémiou
- progresie disekcie do aortálneho oblúku
- perzistujúca bolesť – aortálna ruptúra



Klinické znaky pri diagnostike AAS

Rizikové stavy	Rizikové charakteristiky bolesti	Rizikové nálezy pri vyšetrení
Marfanov sy. (alebo iné ochorenia spojivového tkaniva)	Bolesť na hrudníku, v chrbte alebo abdominálna popisovaná ako: - s náhlym začiatkom - intenzívna - rezavá alebo trhavá, prudká	Známky perfúzneho deficitu - pulzový deficit - rozdiel v sTK - fokálny neurologický deficit (v spojení s bolesťou)
Rodinná anamnéza Ao ochorenia		
Známe ochorenie Ao chlopne		Ao diastolický šelest (novo vzniknutý s bolesťou)
Známa aneuryzma hrudnej aorty		
Predchádzajúca manipulácia v oblasti aorty		Hypotenzia alebo šok

Recommendations	Class ^a	Level ^b
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History and clinical assessment

In all patients with suspected AAS, pre-test probability assessment is recommended, according to the patient's condition, symptoms, and clinical features.	I	B
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*ESC Guidelines on the diagnosis and treatment of aortic diseases. 2014
Rogers AM et al. Circulation 2011
Rizikové skóre 0-3 (bod na stĺpec)*



Diagnostický postup pri AAS

Recommendations	Class ^a	Level ^b
History and clinical assessment		
Evaluation of the patient's condition, symptoms, and clinical features is recommended to determine pretest probability.	I	B
Laboratory testing		
In case of suspicion of AAS, the interpretation of biomarkers should always be considered along with the pretest clinical probability.	IIa	C
In case of low clinical probability of AAS, the determination of D-dimer levels should be considered to rule-out the diagnosis when negative.	IIa	A
In case of intermediate clinical probability of AAS with a positive (point-of-care) D-dimer test, further imaging tests should be considered.	IIa	B
In patients with high probability (risk score 2 or 3) of aortic dissection, testing of D-dimers is not recommended.	III	C

Diagnostický postup pri AAS

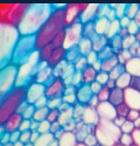
Recommendations	Class ^a	Level ^b
Imaging		
TTE is recommended as an initial imaging investigation.	I	C
In unstable ^d patients with a suspicion of AAS, the following imaging modalities are recommended according to local availability and expertise:		
• TOE	I	C
• CT	I	C

Recommendations	Class ^a	Level ^b
In stable patients with a suspicion of AAS, the following imaging modalities are recommended (or should be considered) according to local availability and expertise:		
• CT	I	C
• MRI	I	C
• TOE	IIa	C
In case of initially negative imaging with persistence of suspicion of AAS, <u>repetitive imaging</u> (CT or MRI) is recommended.	I	C
Chest X-ray may be considered in cases of low clinical probability of AAS.	IIb	C
In case of uncomplicated Type B AD treated medically, <u>repeated imaging</u> (CT or MRI) ^e during the first days is recommended.	I	C



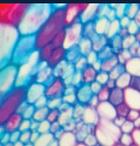
Lab.testy u pacientov s AAS

Laboratory tests	To detect signs of:
Red blood cell count	Blood loss, bleeding, anaemia
White blood cell count	Infection, inflammation (SIRS)
C-reactive protein	Inflammatory response
ProCalcitonin	Differential diagnosis between SIRS and sepsis
Creatine kinase	Reperfusion injury, rhabdomyolysis
Troponin I or T ●	Myocardial ischaemia, myocardial infarction
D-dimer ●	Aortic dissection, pulmonary embolism, thrombosis
Creatinine ●	Renal failure (existing or developing)
Aspartate transaminase/ alanine aminotransferase ●	Liver ischaemia, liver disease
Lactate ●	Bowel ischaemia, metabolic disorder
Glucose	Diabetes mellitus
Blood gases	Metabolic disorder, oxygenation

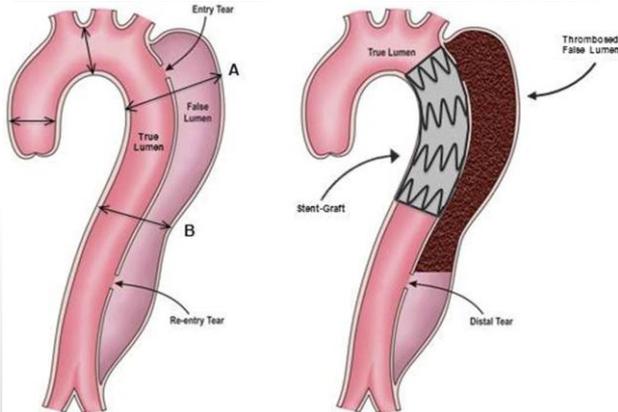
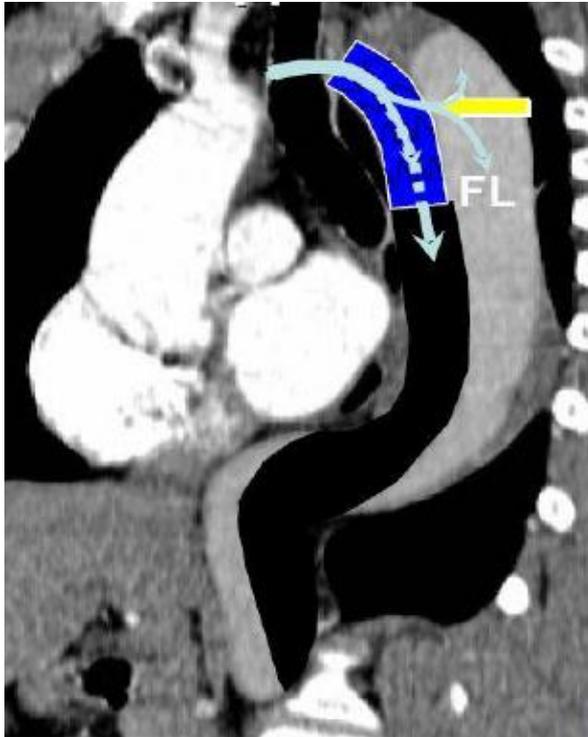


Základné princípy medikamentózneho liečby

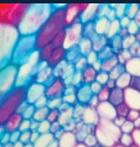
- **Hlavný cieľ** – redukcia “shear” stresu (strihového napätia na aortu)
– redukcia krvného tlaku a kardiálnej kontrakility (dP/dt)
- **Akútna Ao disekcia:** sTK 100-120mmHg (i.v. BB, ďalšie antihypertenzíva)
- **Chronická Ao disekcia:** sTK < 140/90 mmHg
- **Pacienti s Marfanovým sy.** – profylaktické užívanie BB, ACEI, sartanov s cieľom prevencie progresie Ao dilatácie a komplikácií
- **Statíny** môžu inhibovať expanziu aneuryziem



Koncept TEVAR



- Prekrytie proximálneho entry
- Uvoľnenie tlaku vo falošnom lumene (FL)
- Indukcia trombózy FL
- Presmerovanie toku do pravého lumenu + jeho expanzia
- Indukcia aortového remodelingu



Aortálna disekcia – TEVAR

indikácia

Indikácia na individuálnej báze

- anatómia
- klinický stav pacienta
- komorbidity
- individuálna stratifikácia rizika
- multidisciplinárny prístup – aortálne centrum

Recommendations	Class ^a	Level ^b
It is recommended that the indication for TEVAR or EVAR be decided on an <u>individual basis</u> , according to anatomy, pathology, comorbidity and anticipated durability, of any repair, using a <u>multidisciplinary approach</u> .	I	C
A sufficient proximal and distal landing zone of at least 2 cm is recommended for the safe deployment and durable fixation of TEVAR.	I	C
In case of aortic aneurysm, it is recommended to select a stent-graft with a diameter exceeding the diameter of the landing zones by at least 10–15% of the reference aorta.	I	C
During stent graft placement, invasive blood pressure monitoring and control (either pharmacologically or by rapid pacing) is recommended.	I	C
Preventive cerebrospinal fluid (CSF) drainage should be considered in high-risk patients.	IIa	C



Dg. algoritmus pred TEVAR

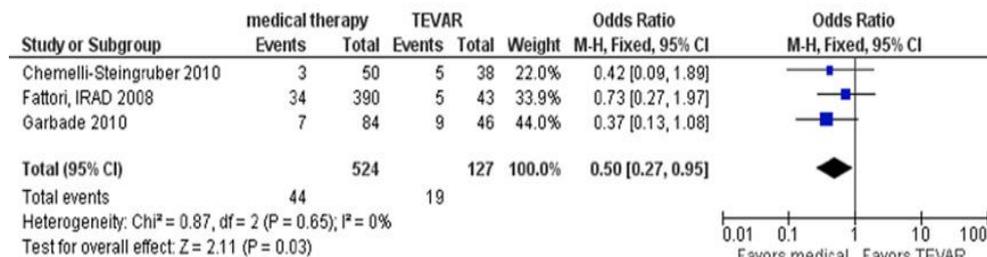
- **CTA – metóda voľby v diagnostike**
- **TTE – na vylúčenie chlopňových a štrukturálnych chýb srdca**
- **DUS supraaortálnych artérií**
- **koronarografia – u pacientov s podozrením na KCHS**



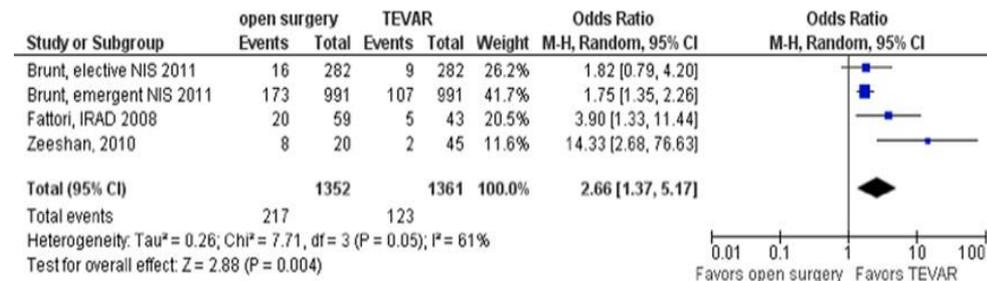
Akútna Ao disekcia typ B – výsledky liečby

- **Medikamentózna liečba (1.480 pts)**
 - skorá mortalita: 6.4%
 - CMP: 4.2%
 - miechová ischémia: 5.3%
 - dlhodobé prežívanie: 70-89%/5 rokov
- **TEVAR (2.359 pts)**
 - skorá mortalita: 10.2%
 - CMP: 4.9%
 - miechová ischémia: 4.2%
 - dlhodobé prežívanie: 56-87%/5 rokov
- **Otvorená chirurgia (1.529 pts)**
 - skorá mortalita: 17.5%
 - CMP: 5.9%
 - miechová ischémia: 3.3%
 - dlhodobé prežívanie: 44-65%/5 rokov

Medical therapy vs. TEVAR for acute type B dissections: early mortality

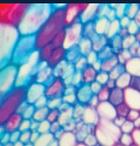


Open surgery vs. TEVAR for acute type B dissections: early mortality



Liečba Ao disekcie typ B

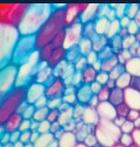
Recommendations	Class ^a	Level ^b
In all patients with AD, medical therapy including pain relief and blood pressure control is recommended.	I	C
In uncomplicated Type B AD, medical therapy should always be recommended.	I	C
In uncomplicated Type B AD, TEVAR should be considered.	IIa	B
In complicated Type B AD, TEVAR is recommended.	I	C
In complicated Type B AD, surgery may be considered.	IIb	C



JACC 2013 Interdisciplinary Expert Consensus Document on Management of Type B Ao Dissection

1. Akútna Ao disekcia typ B komplikovaná:

- hemodynamická instabilita (refraktérna hypertenzia napriek max.med.th., závažná hypotenzia (<90mmHg), šok
- malperfúzia
 - renálna – refraktérna hypertenzia + sKreat
 - spinálna – paraparézia, paraplégia
 - iliacká – končatinová ischemia
 - viscerálna – abdominálna bolesť, nauzea, diarhea (+ Bil, amyláza, hepatálne enzýmy)
- CT progresia periaortálneho hematómu, hemoragický výpotok – hroziaca ruptúra

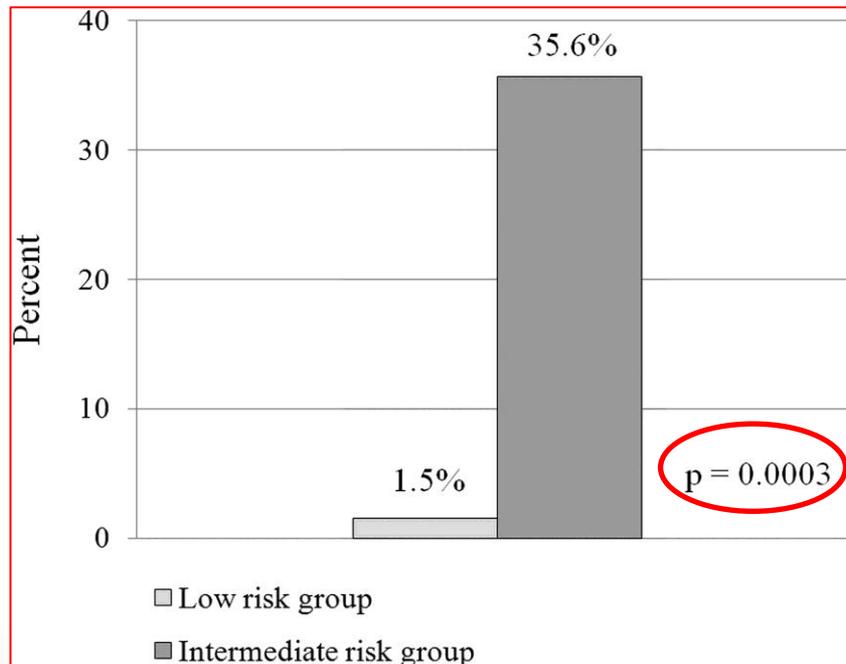


Refraktérna hypertenzia + perzistencia bolesti

Importance of Refractory Pain and Hypertension in Acute Type B Aortic Dissection: Insights From the International Registry of Acute Aortic Dissection (IRAD)

Santi Trimarchi, Kim A. Eagle, Christoph A. Nienaber, Reed E. Pyeritz, Frederik H.W. Jonker, Toru Suzuki, Patrick T. O'Gara, Stuart J. Hutchinson, Vincenzo Rampoldi, Viviana Grassi, Eduardo Bossone, Bart E. Muhs, Arturo Evangelista, Thomas T. Tsai, Jim B. Froehlich, Jeanna V. Cooper, Dan Montgomery, Gabriel Meinhardt, Truls Myrmed, Gilbert R. Upchurch, Thoralf M. Sundt, Eric M. Isselbacher and on behalf of the International Registry of Acute Aortic Dissection (IRAD) Investigators

Circulation. 2010;122:1283-1289; originally published online September 13, 2010;



Zvýšená mortalita u pacientov s akútnou Ao disekciou typ B liečených medikamentózne s prítomnou rekurentnou/refraktérnou bolesťou alebo refraktérnou art.hypertenziou

JACC 2013 Interdisciplinary Expert Consensus Document on Management of Type B Ao Dissection

2. Nekomplikovaná akútna, (subaktna a chronická) Ao disekcia typ B = medikamentózna liečba

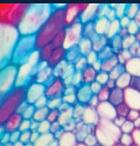
s dôsledným sledovaním:

- hemodynamická instabilita
- orgánová malperfúzia
- periaortálny hematóm
- hemoragický pleurálny výpotok

= komplikovaná Ao disekcia s potrebou urgentného riešenia

Fattori R et al. JACC 2013

Recommendations	Class ^a	Level ^b
In case of uncomplicated Type B AD treated medically, repeated imaging (CT or MRI) ^e during the first days is recommended.	I	C



Subakútna Ao disekcia typ B

TEVAR

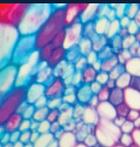
- 30d mortalita 2.8%
- CMP 1.4%
- Spinálna ischémia 2.9%

•Nienaber CA et al. INSTEAD trial Circulation 2009

•Nienaber CA et al. INSTEAD trial J Thorac Cardiovasc Surg 2010

Známky nestability s potrebou intervenčnej liečby:

- zmena Ao morfológie (nárast diametra Ao >4mm, celkový diam>55mm)
- nový periaortálny hematóm
- nový pleurálny hemoragický výpotok
- refraktérna hypertenzia
- rekurencia hrudnej bolesti
- rekurencia príznakov malperfúzie



Intramurálny hematóm

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

Prediktory komplikácií IMH

Persistent and recurrent pain despite aggressive medical treatment ²⁴¹
Difficult blood pressure 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)

Penetrujúci aterosklerotický ulkus

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



Traumatické poranenie aorty

Recommendations	Class ^a	Level ^b
In case of suspicion of TAI, CT is recommended.	I	C
If CT is not available, TOE should be considered	IIa	C
In cases of TAI with suitable anatomy requiring intervention, TEVAR should be preferred to surgery.	IIa	C

Chronická Ao disekcia typ B

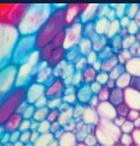
Medikamentózna liečba: 5-ročné prežívanie 60-80%

Prediktory rizika počas sledovania:

- rekurencia symptómov
- aneuryzmatická dilatácia >55mm (riziko ruptúry 30% ročne!)
- ročný nárast Ao diametra >4mm

= chronická komplikovaná Ao disekcia – potreba intervencie

- **TEVAR (1.098 pts):** skorá mortalita 6.6%, CMP 1.9%, miechová ischémia 1.5%
- **Otvorená chirurgia (177 pts):** skorá mortalita 8%, CMP 5.7%, miechová ischémia 5.5%

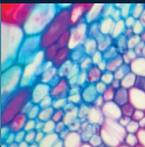


Chronická disekcia typ B

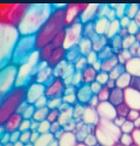
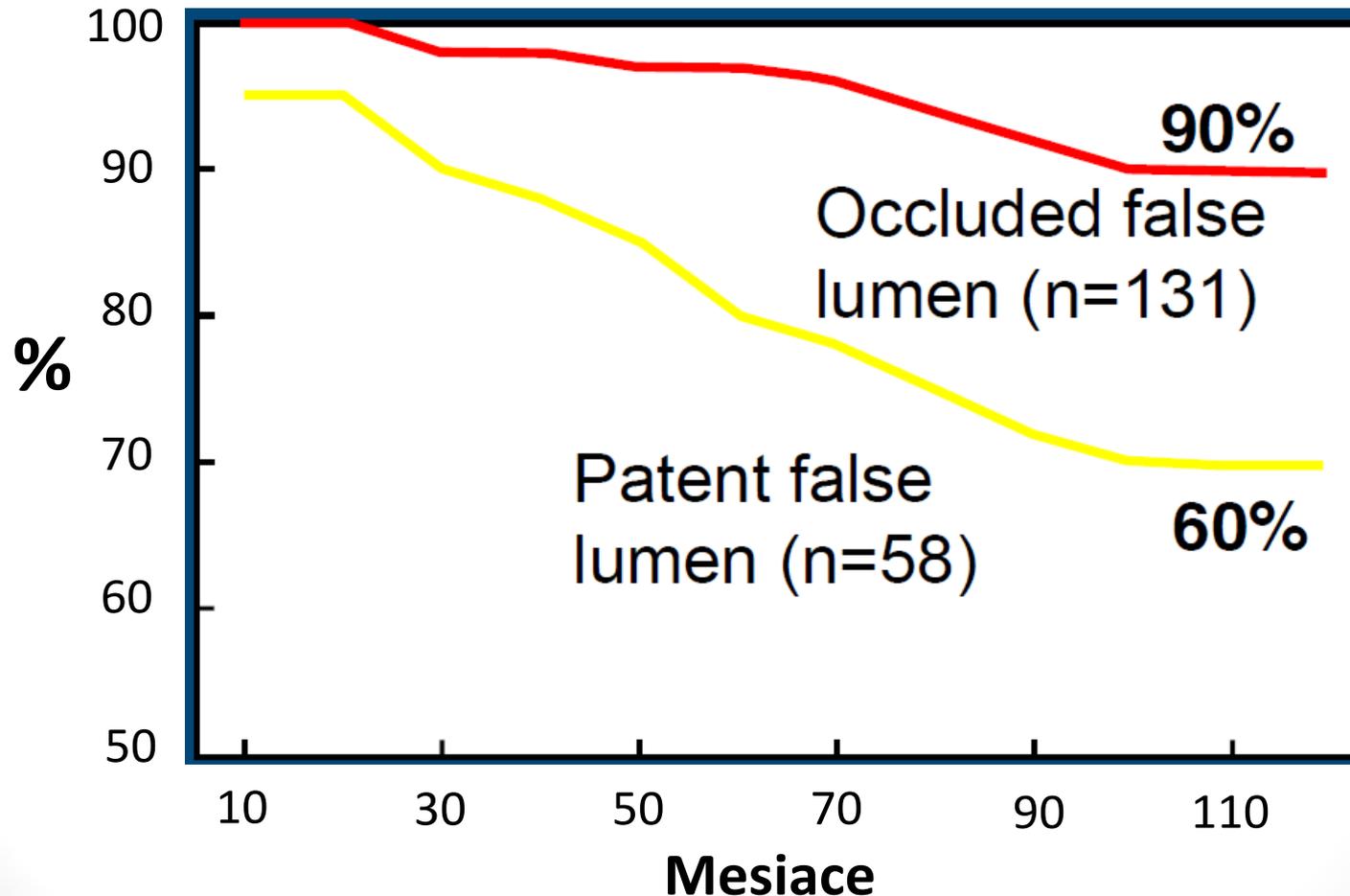
Napriek stabilizácii

- pri konzervatívnej liečbe až 80% pacientov zostáva s inkompletnou trombotizáciou falošného lúmenu (po TEVAR 12%) – pretrvávanie rizika expanzie
- 30% expanzia falošného lúmenu pri konzervatívnej liečbe (4% po TEVAR)

= riziko destabilizácie chronickej disekcie

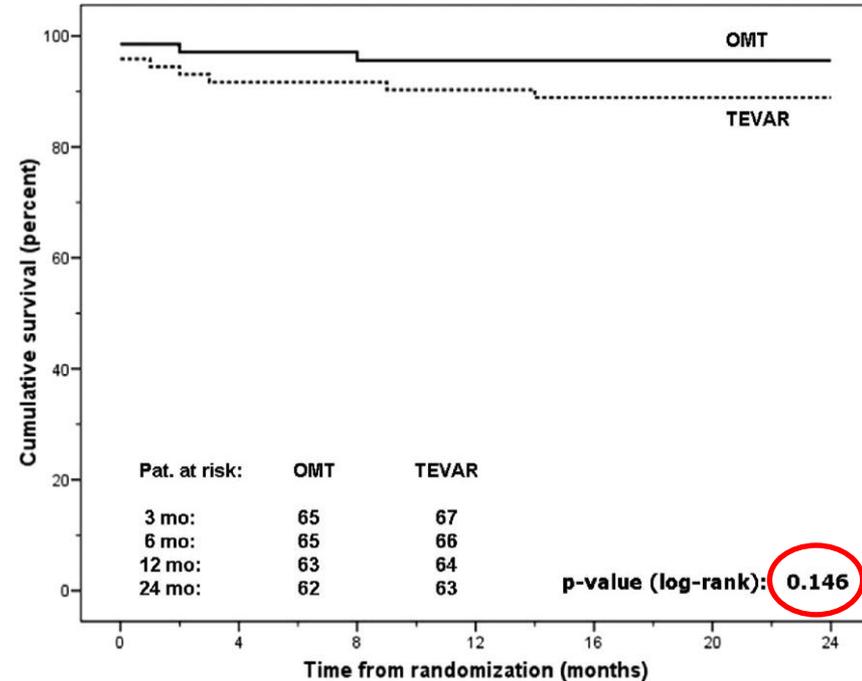


Priechodnosť falošného lumenu vs prežívanie



Chronická disekcia typ B – TEVAR vs OMT – INSTEAD trial

- **Dlhodobé výsledky TEVAR u pacientov s nekomplikovanou subakútnou a chronickou Ao disekciou typ B**
 - 140 pacientov (72 TEVAR vs 68 OMT)
 - klinická stabilita, bez známok spontánnej trombózy FL 14dní–1 rok po vzniku disekcie
- **Bez rozdielu v mortalite v 2 ročnom sledovaní**
 - prežívanie 96% OMT vs 89% TEVAR
 - významný prestup pacientov do TEVAR skupiny: 14%/rok, 20%/2 roky
- **Vyšší stupeň Ao remodelingu po TEVAR 91% vs OMT 19% ($p < 0.001$)**
 - očakávaná redukcia rizika dilatácie a ruptúry Ao v ďalšom sledovaní



INSTEAD-XR (TEVAR pre chron.disekciu 5-ročné výsledky)

5-ročný FU: 32 vs 32 pts

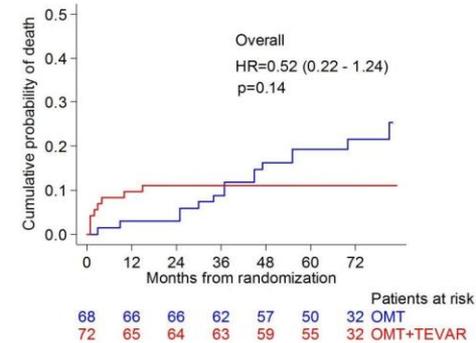
- bez rozdielu v mortalite: HR 0.52 (0.22-1.24, p=0.14)
- dlhodobá KVS mortalita: HR 0.35 (0.13-0.98, p=0.045)
- riziko progresie morfológie Ao patológie: 50% med.th. vs. 25% po TEVAR

TEVAR predstavuje benefit k med.th. v zmysle KVS mortality a prevencie progresie Ao patológie u pacientov s perspektívou prežívania >5 rokov

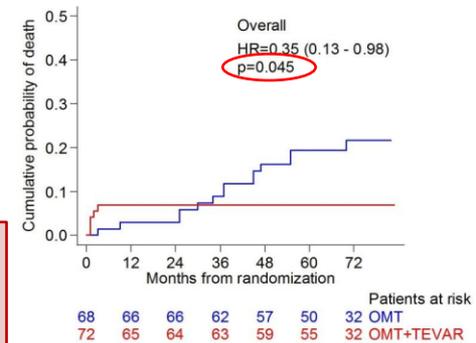
- Význam izolácie falošného lúmenu a Ao remodelingu s následnou dlhodobou stabilitou a redukciou neskorých komplikácií

Nienaber CA et al.Circulation CV Inv 2013

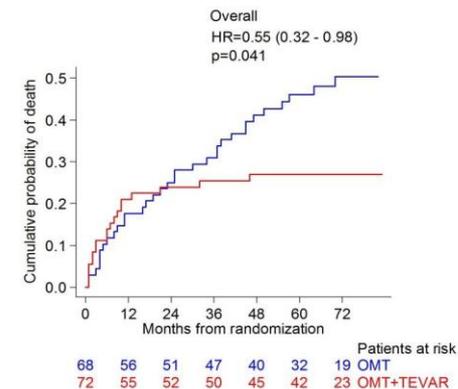
Mortality (1st EP)



CV death (2nd EP)

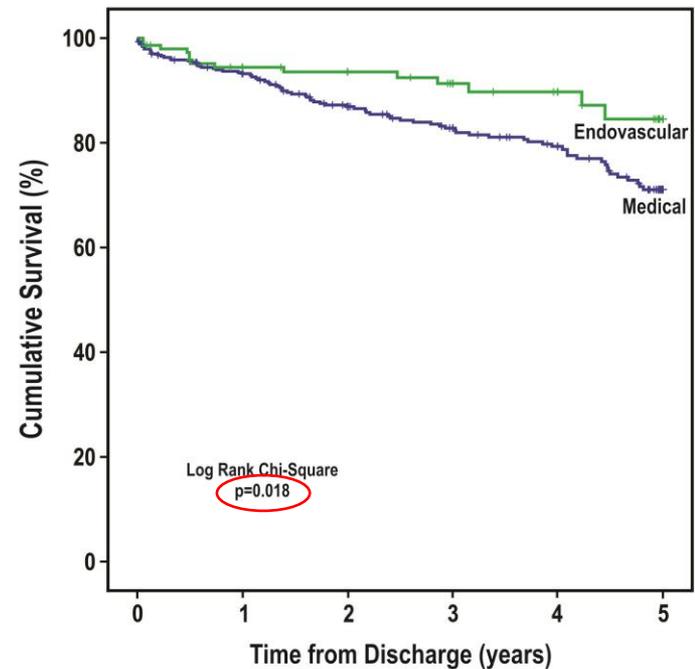
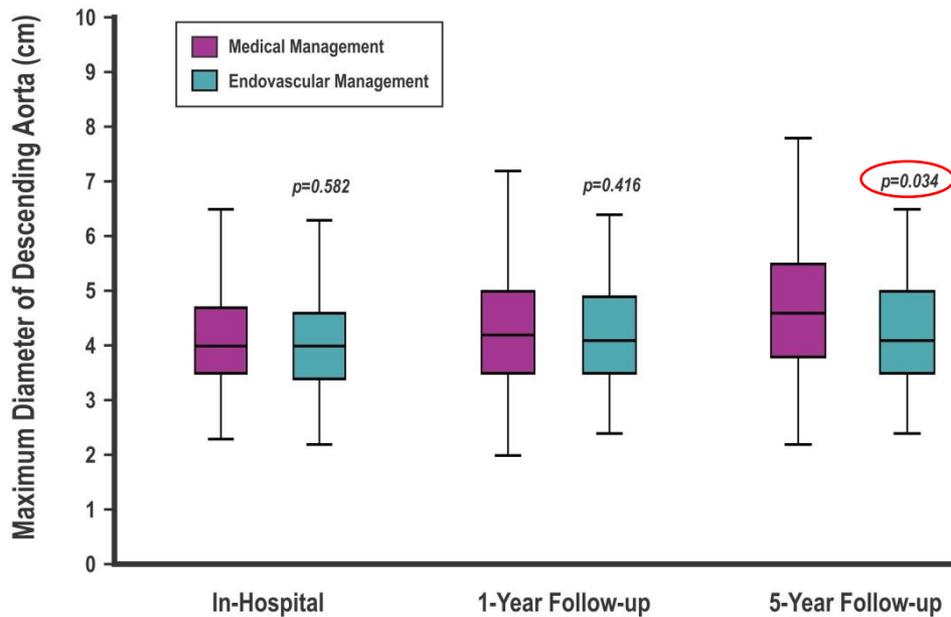


Progression (2nd EP)



Dlhodobé výsledky IRAD – IRAD-LT

TEVAR vs. medical management of type B dissection

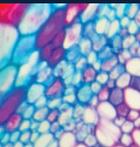
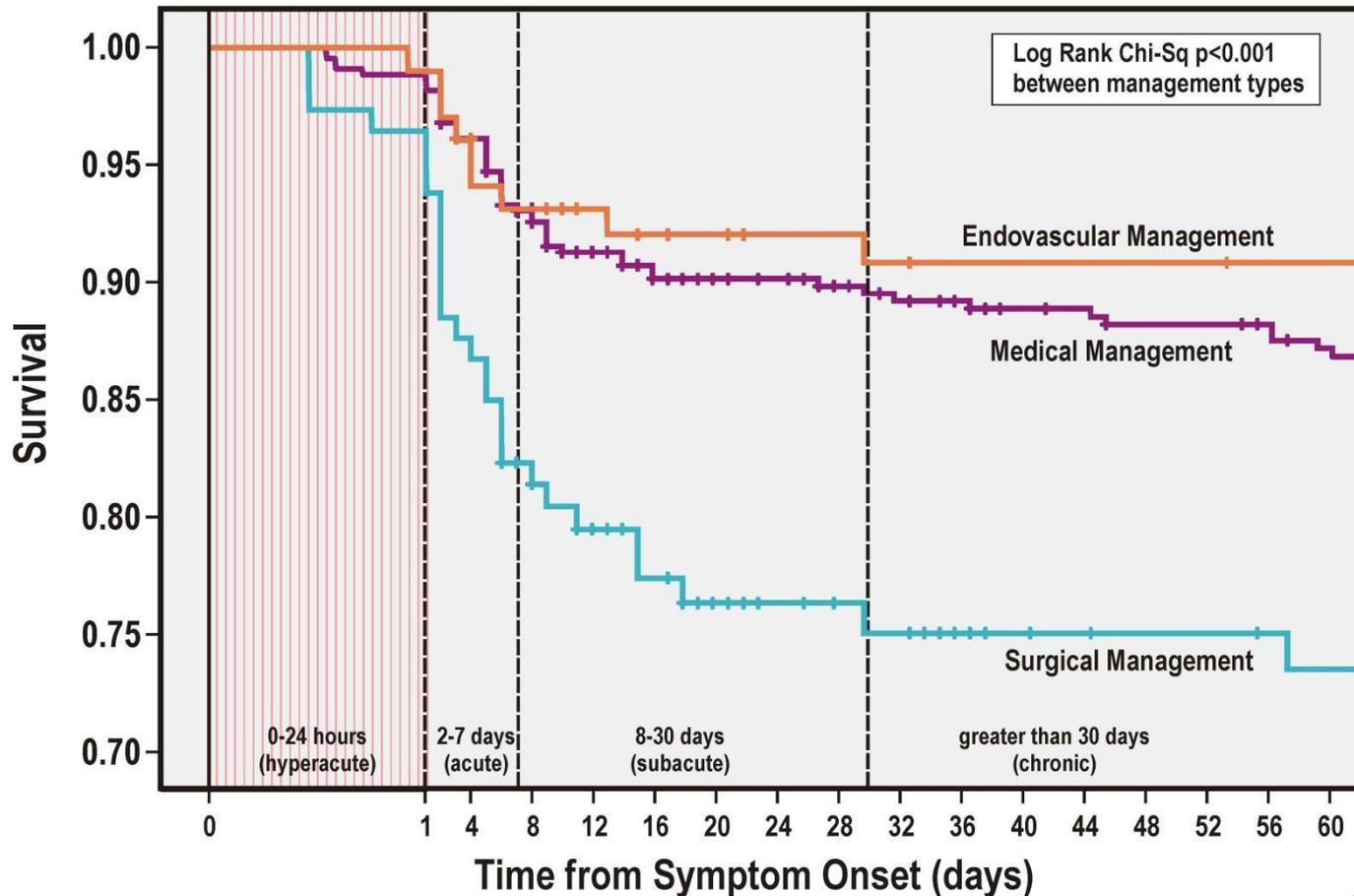


No. at Risk	0	1	2	3	4	5
Endovascular	146	129	107	78	53	25
Medical	434	384	284	218	177	78

Dlhodobé výsledky IRAD – IRAD-LT

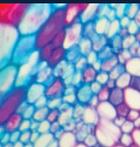
Kaplan-Meier Survival Curve

Dissection Type: B



Aortálna aneuryzma

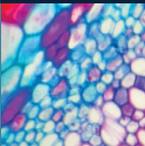
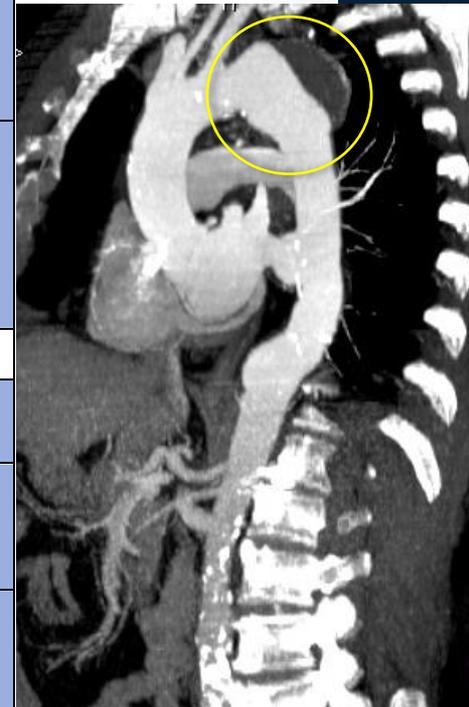
Recommendations	Class ^a	Level ^b
When an aortic aneurysm is identified at any location, assessment of the entire aorta and aortic valve is recommended at baseline and during follow-up.	I	C
In cases of aneurysm of the abdominal aorta, duplex ultrasound for screening of peripheral artery disease and peripheral aneurysms should be considered.	IIa	C
Patients with aortic aneurysm are at increased risk of cardiovascular disease: general principles of cardiovascular prevention should be considered.	IIa	C



Aneuryzma descendentnej aorty

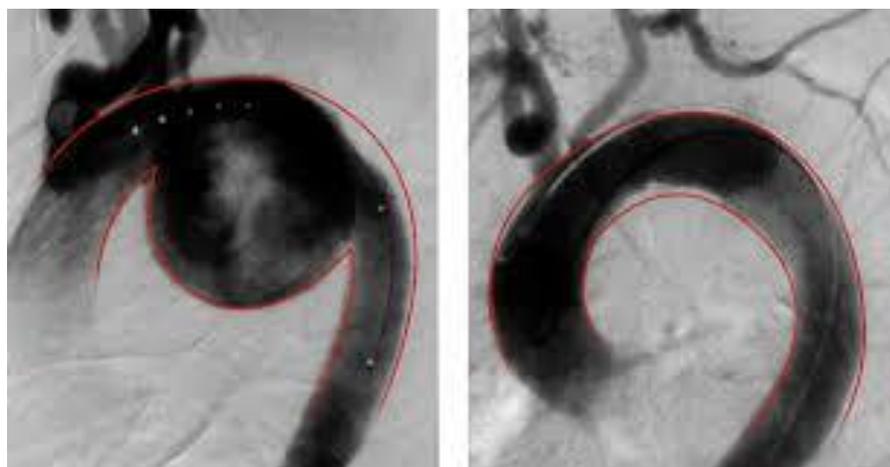


Recommendations	Class ^a	Level ^b
Interventions on aortic arch aneurysms		
Surgery should be considered in patients who have isolated aortic arch aneurysm with maximal diameter ≥ 55 mm.	IIa	C
Aortic arch repair may be considered in patients with aortic arch aneurysm who already have an indication for surgery of an adjacent aneurysm located in the ascending or descending aorta.	IIb	C
Interventions on descending aortic aneurysms		
TEVAR should be considered, rather than surgery, when anatomy is suitable.	IIa	C
TEVAR should be considered in patients who have descending aortic aneurysm with maximal diameter ≥ 55 mm.	IIa	C
When TEVAR is not technically possible, surgery should be considered in patients who have descending aortic aneurysm with maximal diameter ≥ 60 mm.	IIa	C
When intervention is indicated, in cases of Marfan syndrome or other elastopathies, surgery should be indicated rather than TEVAR.	IIa	C



TEVAR pri TAA

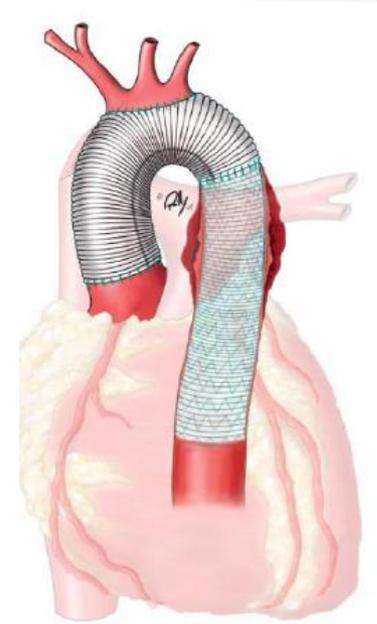
- **Asymptomatická TAA >55mm**
 - pri anatómii TAA rizikovej z ruptúry (sakulárna aneuryzma) možnosť indikácie aj pri menšom diametri
 - Pri vysokom riziku výkonu (komorbidity, vek) možnosť indikácie pri väčšom diametri
- **Rýchla expanzia TAA >5mm/6 mesiacov**



Hybridné výkony

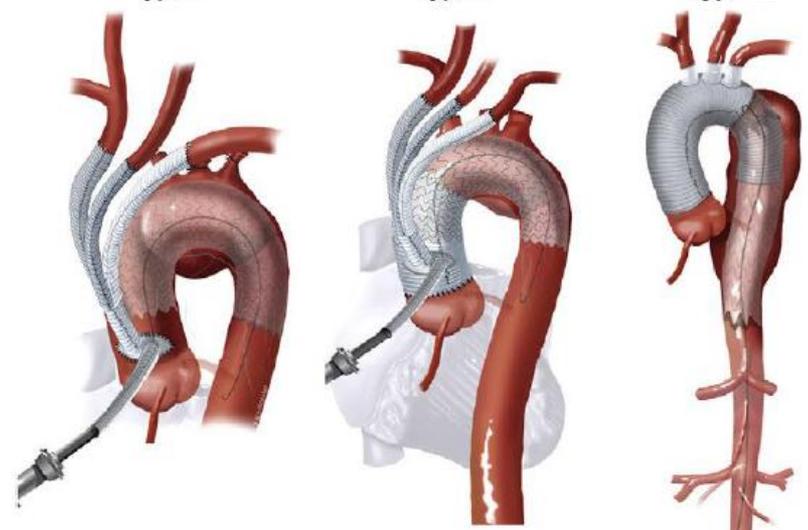
Extenzívne postihnutie aortového oblúku + descendentnej aorty

1. „Frozen elephant trunk“ technika – chirurgická rekonštrukcia Ao oblúku + otvorená antegrádna implantácia SG do descendentnej aorty počas cirkulačného arestu



Frozen elephant trunk

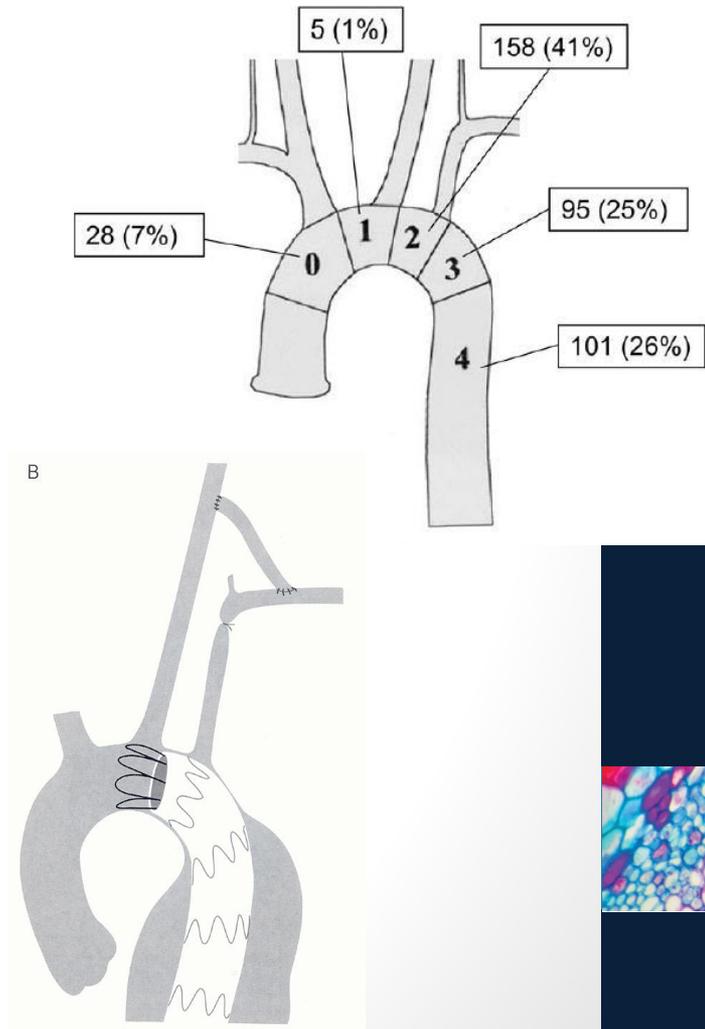
1. Transpozícia supraaortových vetiev, alebo bypass s následnou implantáciou SG do Ao oblúku a desc.Ao



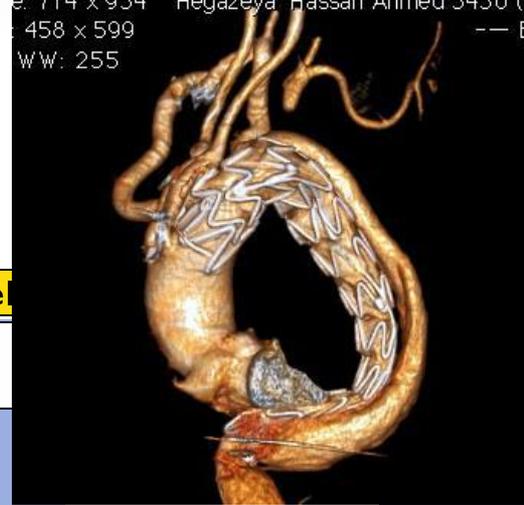
Potreba prekrytia a.subclavia pri TEVAR

Prekrytie a.subclavia l.sin. väčšinou nevyhnutné

- zvýšené riziko TIA/CMP/miechovej
ischémie
- **potreba preventívnej bypassovej
operácie v prípadoch:**
 - dominantná ľavá AV, alebo absencia pravej
AV
 - extenzívny výkon na hrudnej Ao
 - predchádzajúci výkon na abdominálnej
aorte



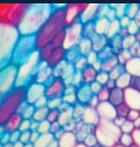
Sledovanie po TEVAR



Recommendations	Class ^a	Level
Follow-up after endovascular treatment for aortic diseases		
After TEVAR or EVAR, surveillance is recommended after 1 month, 6 months, 12 months, and then yearly. Shorter intervals can be proposed in the event of abnormal findings requiring closer surveillance.	I	C
CT is recommended as the first-choice imaging technique for follow-up after TEVAR or EVAR.	I	C
For patients with <u>TAA <45 mm</u> , <u>annual imaging</u> is recommended; while in patients with <u>TAA ≥45 mm and <55 mm</u> , <u>imaging every 6 months</u> is recommended, unless the stability of the lesions is confirmed by serial imaging	I	C
For follow-up after (T)EVAR in young patients, MRI should be preferred to CT for magnetic resonance-compatible stent grafts, to reduce radiation exposure.	IIa	C

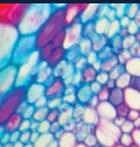
Genetické testovanie

Recommendations	Class ^a	Level ^b
It is recommended <u>to investigate first-degree relatives (siblings and parents)</u> of a subject with TAAD to identify a familial form in which relatives all have a 50% chance of carrying the family mutation/disease.	I	C
Once a familial form of TAAD is highly suspected, it is recommended to refer the patient to a geneticist for family investigation and molecular testing.	I	C
Variability of age of onset warrants <u>screening every 5 years</u> of 'healthy' at-risk relatives until diagnosis (clinical or molecular) is established or ruled out.	I	C
In familial non-syndromic TAAD, screening for aneurysm should be considered, not only in the thoracic aorta, but also throughout the arterial tree (including cerebral arteries).	IIa	C



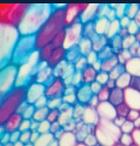
Ochorenie spojivového tkaniva

- TEVAR nie je odporúčaný
- Len ako premostujúci výkon k definitívnemu OP riešeniu, resp. po predchádzajúcej rekonštrukcii aorty, kedy landing zóny SG sú protézy graftu (napr. po OP pacienta s Marfanovým sy.)



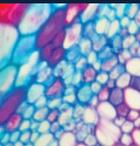
Komplikácie TEVAR

- 1. Retrográdna disekcia typ A: 0.7-2.5%**
- 2. CMP: 2.1-3.5%**
- 3. Miechová ischémia (paraparéza/paraplégia): 0.8-1.9%**
- 4. Krvácanie z prístupového miesta – vaskulárne komplikácie**
- 5. Erózia pažeráka alebo ľavého bronchu (aorto-ezofageálna, aorto-bronchiálna fistula)**



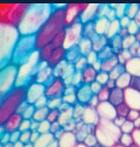
Aortálne aterosklerotické pláty

Recommendations	Class ^a	Level ^b
In the presence of aortic atherosclerosis, general preventive measures to control risk factors are indicated.	I	C
In the case of aortic plaque detected during the diagnostic work-up after stroke or peripheral embolism, anticoagulation or antiplatelet therapy should be considered. The choice between the two strategies depends on comorbidities and other indications for these treatments.	IIa	C
Prophylactic surgery to remove high-risk aortic plaque is not recommended.	III	C



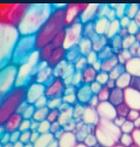
Koarktácia aorty – odp.intervenčného postupu

Recommendations	Class ^a	Level ^b
In all patients with a non-invasive pressure difference >20 mm Hg between upper and lower limbs, regardless of symptoms but with upper limb hypertension (>140/90 mm Hg in adults), abnormal blood pressure response during exercise, or significant left ventricular hypertrophy, an intervention is indicated.	I	C
Independent of the pressure gradient, hypertensive patients with >50% aortic narrowing relative to the aortic diameter at the diaphragm level (on MRI, CT, or invasive angiography) should be considered for intervention.	IIa	C
Independent of the pressure gradient and presence of hypertension, patients with >50% aortic narrowing relative to the aortic diameter at the diaphragm level (on MRI, CT, or invasive angiography) may be considered for intervention.	IIb	C



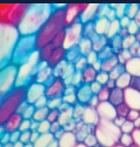
Záver

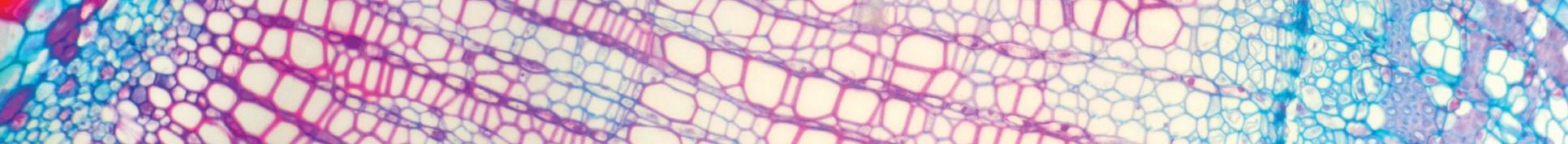
- Akútna komplikovaná distálna disekcia = TEVAR
- Akútna nekomplikovaná vysoko riziková distálna disekcia = odložený TEVAR
- Akútna extenzívna disekcia (DeBakey typ I) = chirurgia + TEVAR
- Chronická distálna disekcia s aneuryzmatickou degeneráciou = TEVAR
- Nekomplikovaná nízko riziková disekcia = med.liečba, sledovanie
- Dlhodobé výsledky štúdií INSTEAD-XL and IRAD-LT podporujú snahu o indukciu Ao remodelingu pomocou TEVAR u každej Ao disekcie typu B



Kľúč k úspešnej liečbe ochorení hrudnej aorty

- Rýchla diagnóza
- Rýchla urgentná starostlivosť + transport v prípade potreby
- Skúsené multidisciplinárne aortové centrum
- Intervencia so zohľadnením rizikovosti
- Možnosť hybridnej operácie
- Adekvátne dlhodobé špecializované sledovanie





VII. angiologický deň

NÁRODNÉHO ÚSTAVU SRDCOVÝCH A CIEVNYCH CHORÔB, a. s.

26. SEPTEMBRA 2014

ĎAKUJEM ZA POZORNOSŤ

