INFEKČNÍ ENDOKARDITIS Z POHLEDU KARDIOCHIRURGA

Štěpán ČERNÝ
Klinika kardiovaskulární chirurgie FN Motol a 2.LF UK
Praha

IE Z POHLEDU KARDIOCHIRURGA

Pohled kardiochirurga na IE v roce 2024….

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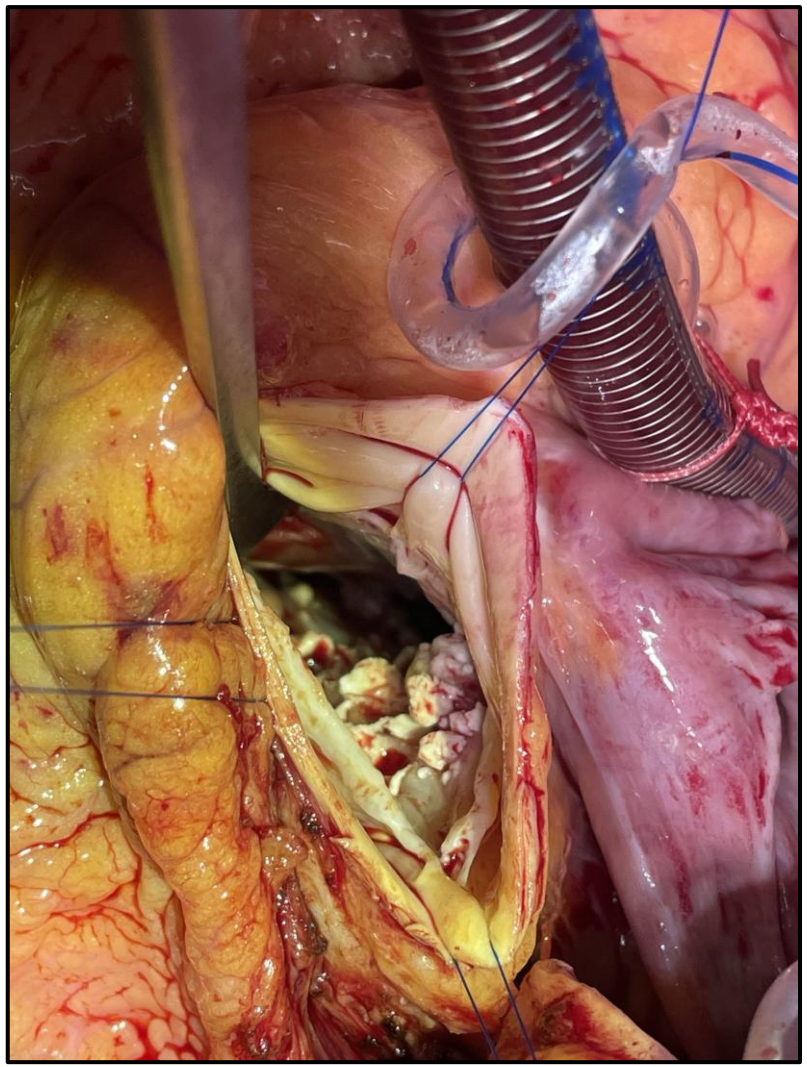

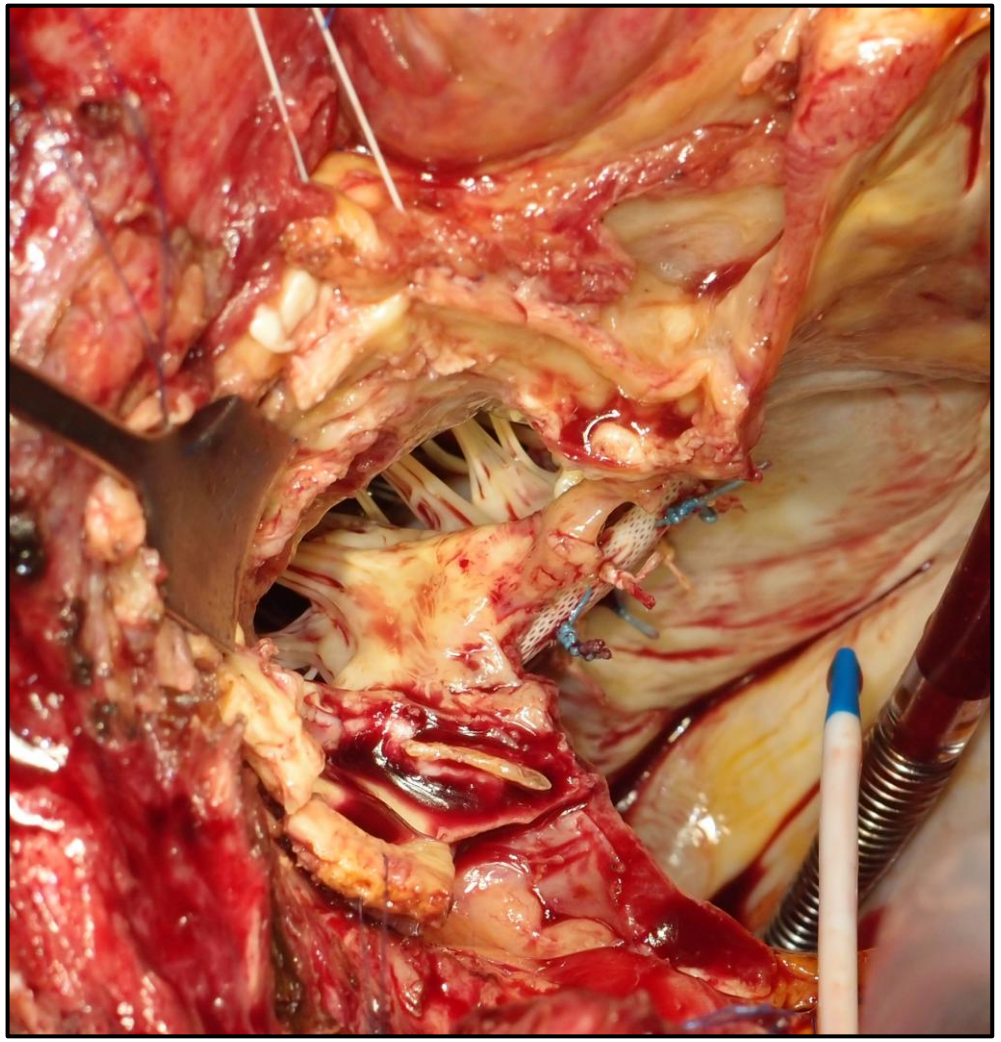

IE Z POHLEDU KARDIOCHIRURGA

ESC European Society of Cardiology
European Heart Journal (2023) 44, 3948–4042
https://doi.org/10.1093/eurheartj/ehad193

ESC GUIDELINES

2023 ESC Guidelines for the management of endocarditis

Developed by the task force on the management of endocarditis of the European Society of Cardiology (ESC)

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS) and the European Association of Nuclear Medicine (EANM)

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Delgado V et al: Eur Heart J 2023; 44(39): 3948-4042

IE Z POHLEDU KARDIOCHIRURGA

ESC Guidelines for the management of endocarditis:

- Prevence
- Diagnóza
- Prognostické zhodnocení
- Antimikrobiální terapie
- Indikace k chirurgické léčbě a hlavní komplikace endokarditidy
- Ostatní komplikace endokarditidy
- Chirurgická léčba – principy a metody
- Výsledky po propuštění a dlouhodobá prognóza
- Management specifických situací

Delgado V et al: Eur Heart J 2023; 44(39): 3948-4042

IE Z POHLEDU KARDIOCHIRURGA

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IE Z POHLEDU KARDIOCHIRURGA

INDIKACE K CHIRURGICKÉ LÉČBĚ:

- Infekční endokarditida je spojená s určitými riziky a komplikacemi, které mohou být zvládnuty pouze chirurgickou léčbou
- Riziko při urgentních operacích pro IE je vysoké, ale přesto je přežívání u pacientů s komplikacemi v prvním roce vyšší až o 20% oproti konzervativnímu postupu
- 3 Klasické indikace k chirurgické léčbe:

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- 3 Klasické indikace k chirurgické léčbe:
  - **SRDEČNÍ SELHÁNÍ**
  - **PERZISTUJÍCÍ SEPSE/LOKÁLNÍ KOMPLIKACE**
  - **VYSOKÝ EMBOLIZAČNÍ POTENCIÁL**

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INDIKACE K CHIRURGICKÉ LÉČBĚ:

Srdeční selhání

(i) Heart failure		
Emergency[d] surgery is recommended in aortic or mitral NVE or PVE with severe acute regurgitation, obstruction, or fistula causing refractory pulmonary oedema or cardiogenic shock.[420,423,424,429,476,477]	I	B
Urgent[d] surgery is recommended in aortic or mitral NVE or PVE with severe acute regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance.[5,420–422,429]	I	B

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INDIKACE K CHIRURGICKÉ LÉČBĚ:

Perzistující sepse/Lokální komplikace

(ii) Uncontrolled infection		
Urgent[d] surgery is recommended in locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation, prosthetic dehiscence, new AVB).[5,420,421,429,445]	I	B
Urgent[d] or non-urgent surgery is recommended in IE caused by fungi or multiresistant organisms according to the haemodynamic condition of the patient.[420]	I	C
Urgent[d] surgery should be considered in IE with persistently positive blood cultures >1 week or persistent sepsis despite appropriate antibiotic therapy and adequate control of metastatic foci.[436,437]	IIa	B
Urgent[d] surgery should be considered in PVE caused by *S. aureus* or non-HACEK Gram-negative bacteria[5,385,449]	IIa	C

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INDIKACE K CHIRURGICKÉ LÉČBĚ:

Vysoký embolizační potenciál

(iii) Prevention of embolism		
Urgent[d] surgery is recommended in aortic or mitral NVE or PVE with persistent vegetations ≥10 mm after one or more embolic episodes despite appropriate antibiotic therapy.[451,455,457,471,478]	I	B
Urgent[d] surgery is recommended in IE with vegetation ≥10 mm and other indications for surgery.[5,460,465,466,471,478]	I	C
Urgent[d] surgery may be considered in aortic or mitral IE with vegetation ≥10 mm and without severe valve dysfunction or without clinical evidence of embolism and low surgical risk.[460,463,465,473,478]	IIb	B

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OSTATNÍ KOMPLIKACE IE - Neurologické:

Indikace a načasování chirurgické léčby po neurologické komplikaci u IE

Recommendations	Class[a]	Level[b]
After a transient ischaemic attack, cardiac surgery, if indicated, is recommended without delay.[454,468]	I	B
After a stroke, surgery is recommended without any delay in the presence of HF, uncontrolled infection, abscess, or persistent high embolic risk, as long as coma is absent and the presence of cerebral haemorrhage has been excluded by cranial CT or MRI.[451,468,473,567,568,570–578]	I	B
Following intracranial haemorrhage, delaying cardiac surgery >1 month, if possible, with frequent re-assessment of the patient's clinical condition and imaging should be considered.[571]	IIa	C
In patients with intracranial haemorrhage and unstable clinical status due to HF, uncontrolled infection or persistent high embolic risk, urgent or emergency surgery should be considered weighing the likelihood of a meaningful neurological outcome.[199,581–584]	IIa	C

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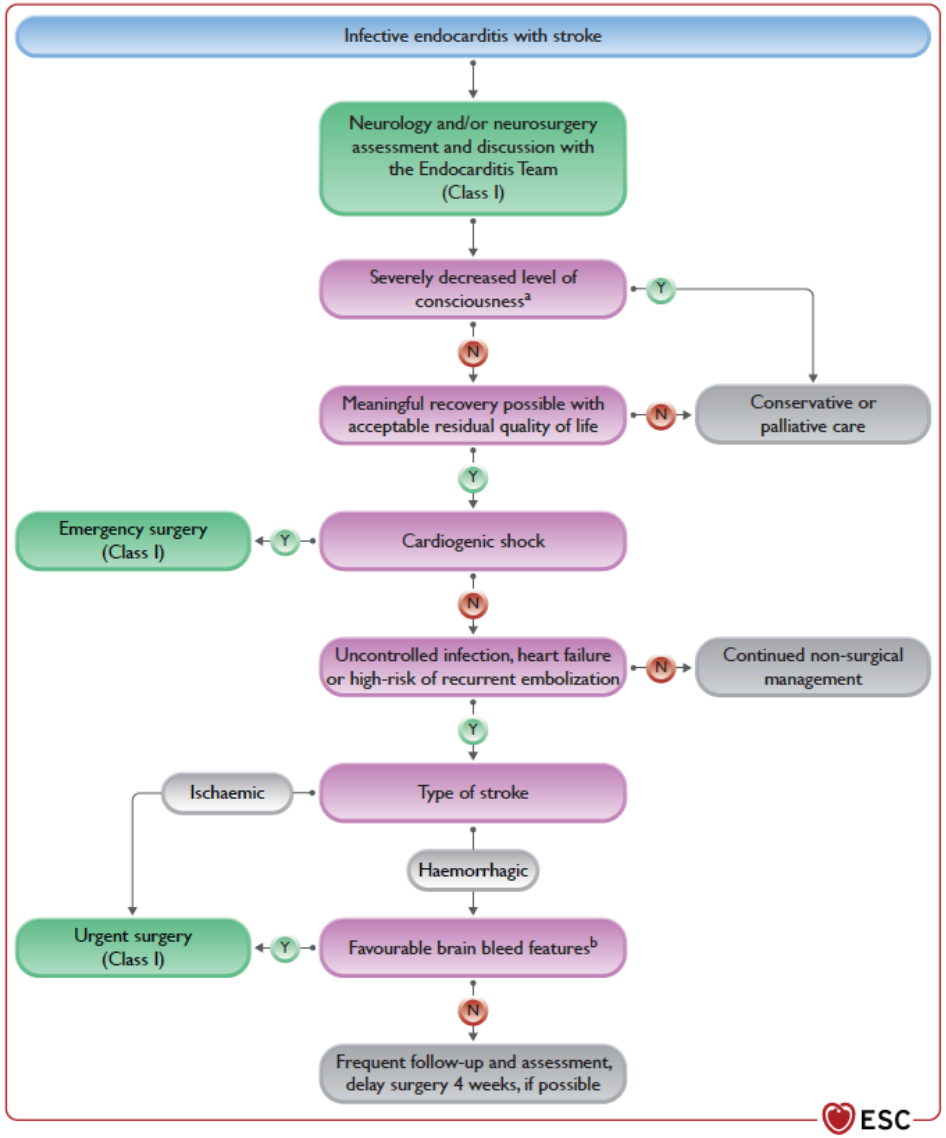

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IE Z POHLEDU KARDIOCHIRURGA

CHIRURGICKÝ PŘÍSTUP A TECHNIKY:

- Cílem chirurgické léčby IE je odstranění infikované tkáně a obnovení anatomie a hemodynamické funkce.
- Součástí operačního výkonu je odběr vzorků na základě kterých se dále modifikuje antibiotická terapie
- Postižení aortální chlopně často vyžaduje náhradu, zachování nativní chlopně je málokdy možné
- Při postižení mitrální chlopně je zachování nativní chlopně možné, ale obvykle vyžaduje komplexní rekonstrukční výkon
- Při náhradě chlopně není jednoznačně doporučován typ náhrady, záleží na mnoha další faktorech (věk, celkový stav, neurologické postižení atd.)
- V případě předoperačně přítomného AVB vyššího stupně by se v některých situacích mělo zvážit peroperační zavedení trvalého epikardiálního stimulačního systému

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CHIRURGICKÝ PŘÍSTUP A TECHNIKY:

Předoperační AV blokáda:

Recommendations	Class[a]	Level[b]
Immediate epicardial pacemaker implantation should be considered in patients undergoing surgery for valvular IE and complete AVB if one of the following predictors of persistent AVB is present: pre-operative conduction abnormality, *S. aureus* infection, aortic root abscess, tricuspid valve involvement, or previous valvular surgery.[515]	IIa	C

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CHIRURGICKÝ PŘÍSTUP A TECHNIKY:

Volba chlopenní náhrady:

Table 12 Features favouring a non-mechanical valve substitute in the setting of surgery for acute infective endocarditis

Early surgery after a recent ischaemic stroke
Evidence of intracranial bleeding
Woman of childbearing age
High likelihood of prolonged mechanical circulatory support
Advanced age or frailty
Poor or unknown medical compliance
Expected complicated and prolonged post-operative course
Patient preference

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VOLBA CHLOPENNÍ NÁHRADY

Preferenční výkony na chlopních
AoV - aortální homograft
PV – pulmonální homograft
MV, TV – snaha o záchovné operace, náhrada chlopně jen ve vynucených případech

https://consultqd.clevelandclinic.org/surgical-treatment-of-infective-endocarditis-when-to-repair-when-to-replace/

VOLBA PROTÉZY – MECHANICKÁ ČI BIOLOGICKÁ?

Can prosthesis type influence the recurrence of infective endocarditis after surgery for native valve endocarditis? A propensity weighted comparison

Antonino S. Rubino [a,b,*], Ester E. Della Ratta[a], Denise Galbiati[a], Rasul Ashurov[a], Viviana L. Galgano[a], Antonio P. Montella [a], Marisa De Feo[a] and Alessandro Della Corte [a]

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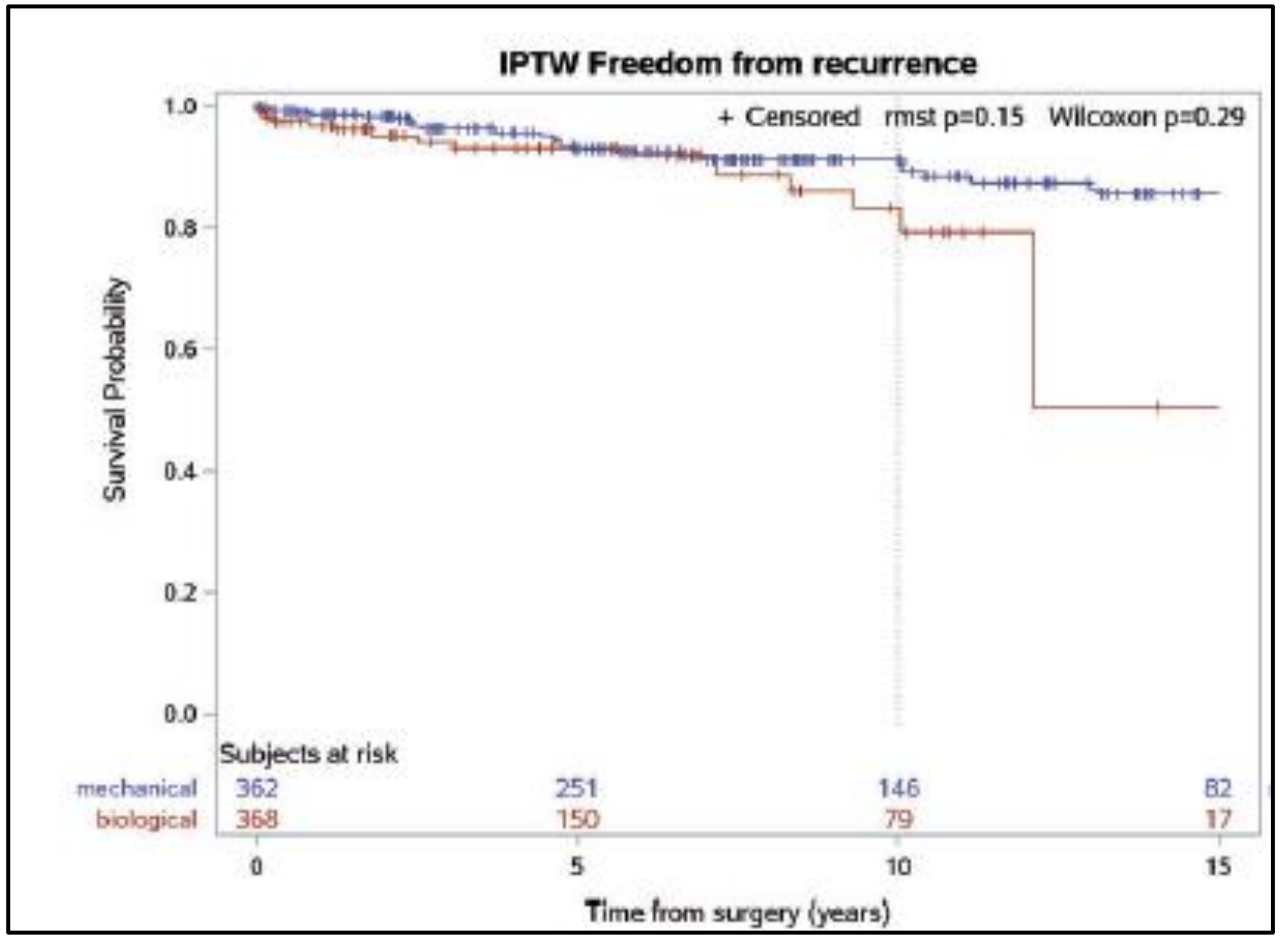
Rubino S et al: Eur J Cardiothor Surg 2021; 60: 1388-1394

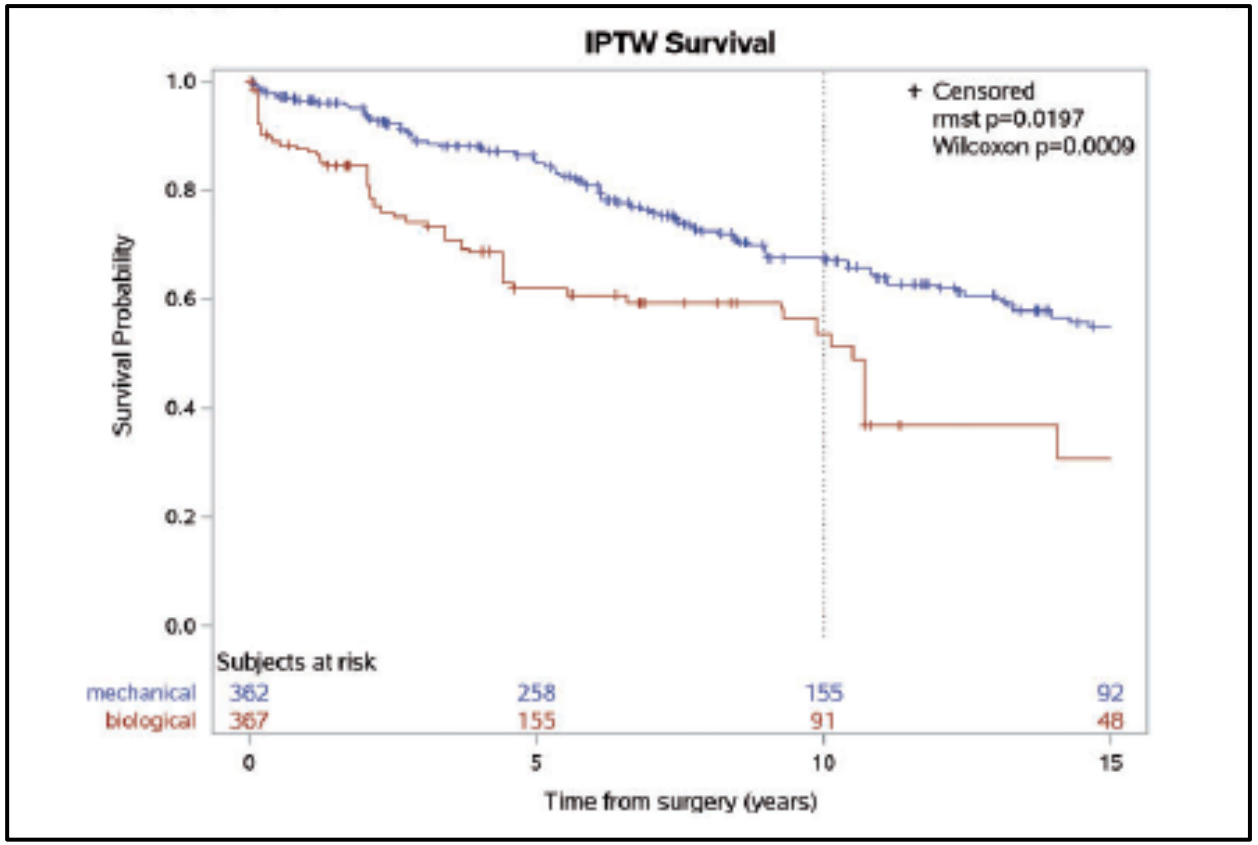
VOLBA PROTÉZY – MECHANICKÁ ČI BIOLOGICKÁ?



- Endokarditida chlopní levého srdce
- 314 mechanických chlopní
- 81 biologických chlopní
- IPTW (Inverse probability oftreatment weighting

Rubino S et al: Eur J Cardiothor Surg 2021; 60: 1388-1394

VOLBA PROTÉZY – MECHANICKÁ ČI BIOLOGICKÁ?



Key question

Is there long-term superiority of any valve substitute for left-sided native valve infective endocarditis?

Key finding(s)

Survival benefit only after mechanical aortic valve replacement. Similar recurrence or reoperation rates.

Take-home message

We found a clinical trend in favour of mechanical valves, especially in the aortic position. However, patient characteristics should drive the choice of prosthesis.

Rubino S et al: Eur J Cardiothor Surg 2021; 60: 1388-1394

VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?

Cryopreserved aortic homografts for complex aortic valve or root endocarditis: a 28-year experience

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[b] Treviso Tissue Bank Foundation, Treviso, Italy
[c] Department of Cardiology, Azienda Sanitaria dell'Alto Adige, Bolzano, Italy

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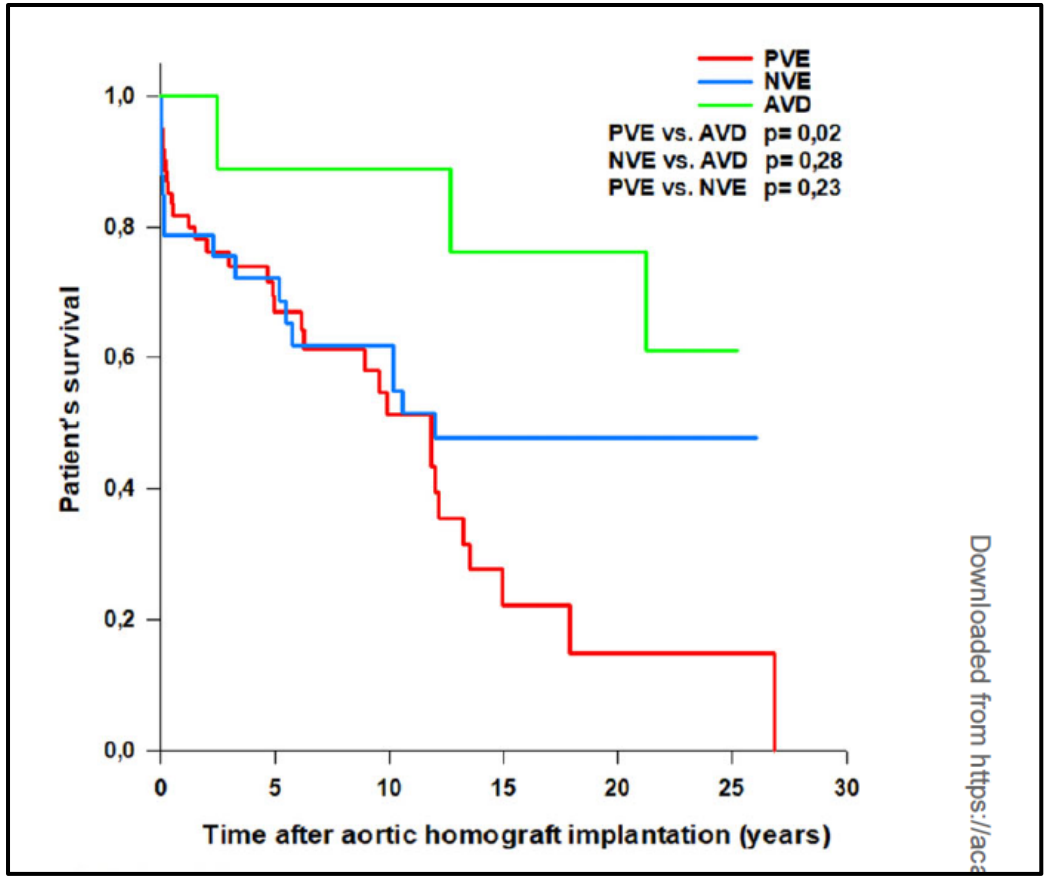
Galeone A et al: Eur J Cardiothor Surg 2022; 62(3): ezac193

VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?



- 104 pacientů AVR/ARR
- 94 IE
  - 33 NVE (prům. věk 52 let)
  - 61 PVE (prům. věk 70 let)
- 10 non IE AVD
- 12% inhospitalizační mortalita

Galeone A et al: Eur J Cardiothor Surg 2022; 62(3): ezac193

VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?

A 20-year experience with cryopreserved allografts as the valve replacement of choice in aortic root reconstruction for destructive endocarditis with abscess formation

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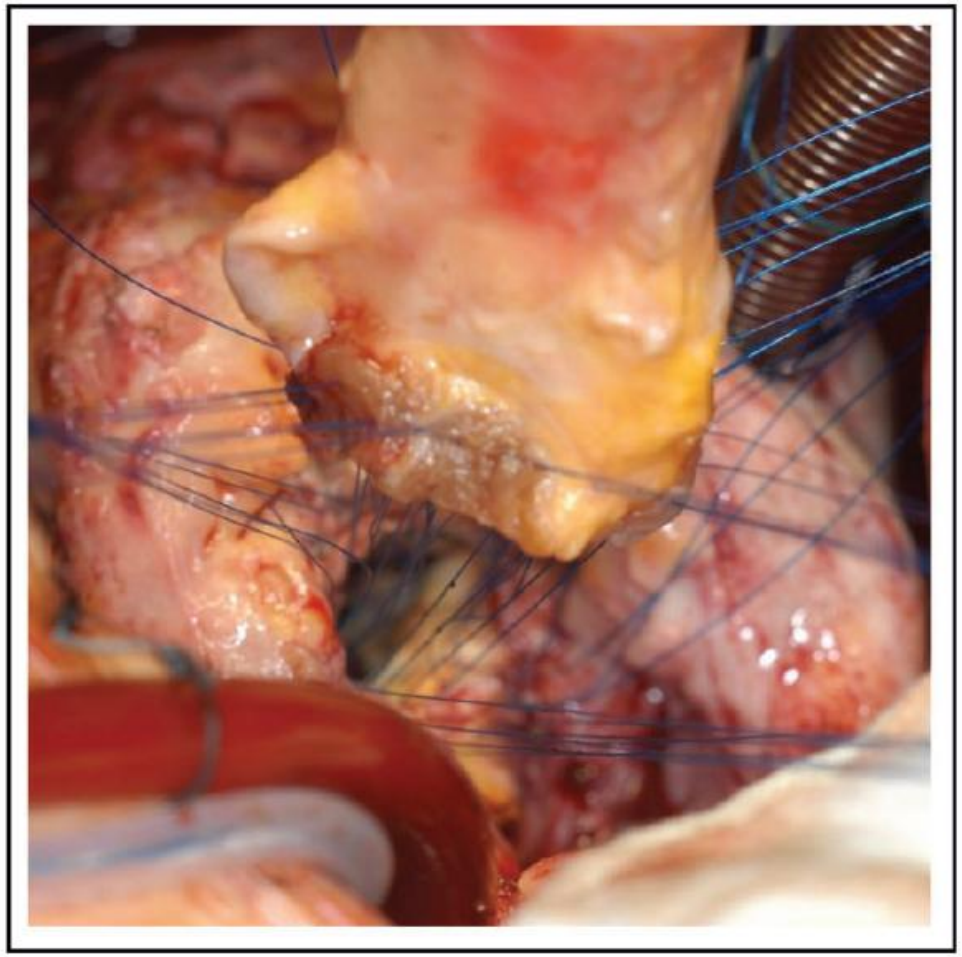
Yousif A et al: Interact Eur J Cardiovasc Thorr Surg 2022; 35(2): ivac188

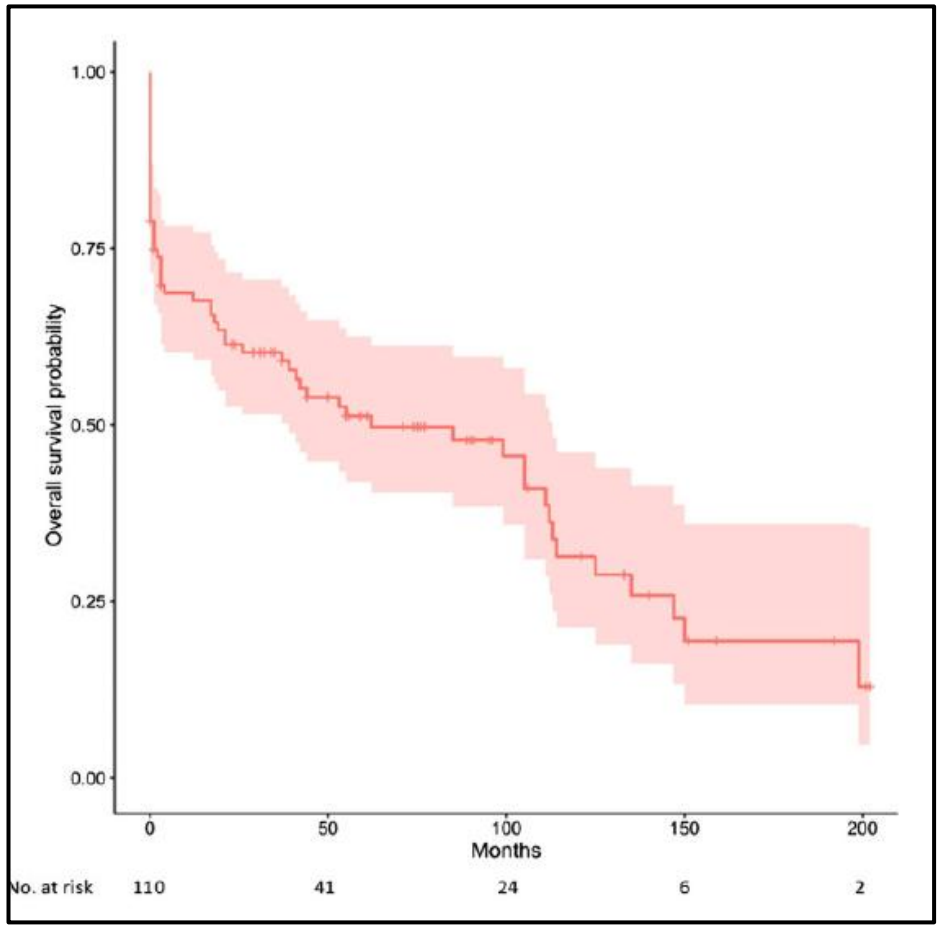
VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?



- 110 s NVE nebo PVE (86,4%)
- 91% emergentní operace během 48 hodin od přijetí
- 30denní mortalita 18%

Yousif A et al: Interact Eur J Cardiovasc Thorr Surg 2022; 35(2): ivac188

VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?



Key question

What are the outcomes in patients undergoing aortic allograft replacement in destructive endocarditis with abscess formation?

Key finding(s)

The long-term freedom from re-intervention reached 83.3 % at 10 yrs. with a freedom from re-endocarditis of 95% after 10 yrs.

Take-home message

In abscessed aortic root endocarditis allografts exhibit excellent performance with a low rate of reinfection and reintervention making their use a very desirable option.

Yousif A et al: Interact Eur J Cardiovasc Thorr Surg 2022; 35(2): ivac188

VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?

Homograft Versus Valves and Valved Conduits for Extensive Aortic Valve Endocarditis with Aortic Root Involvement/Destruction: A Systematic Review and Meta-Analysis

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Aorta (Stamford) 2022;10:43–51.

Williams ML et al: Aorta (Stamford) 2022; 10: 43-51

VOLBA PROTÉZY – AORTÁLNÍ HOMOGRAFT?

Abstract

Aortic valve infective endocarditis is a life-threatening condition. Patients frequently present profoundly unwell and extensive surgery may be required to correct the underlying anatomical deficits and control sepsis. Periannular involvement occurs in more than 10% of patients with aortic valve endocarditis. Complex aortic valve endocarditis has a mortality rate of 10 to 40%. Longstanding surgical dogma suggests homografts represent the optimal replacement option in complex aortic valve endocarditis; however, there is a paucity of evidence and lack of consensus on the optimal replacement choice. A systematic review and meta-analysis was performed utilizing EMBASE, PubMed, and the Cochrane databases to review articles describing homografts versus aortic valve replacement and/or valved conduit graft implantation for complex aortic valve endocarditis. The outcomes of interest were mortality, reinfection, and reoperation. Eleven studies were included in this meta-analysis, contributing 810 episodes of complex aortic valve endocarditis. All included reports were cohort studies. There was no statistically significant difference in overall mortality (risk ratio [RR] 0.99; 95% confidence interval [CI], 0.61–1.59; $p = 0.95$), reinfection (RR 0.89; 95% CI, 0.45–1.78; $p = 0.74$), or reoperation (RR 0.91; 95% CI, 0.38–2.14; $p = 0.87$) between the homograft and valve replacement/valved conduit graft groups. Overall, there was no difference in mortality, reinfection, or reoperation rates between homografts and other valve or valved conduits in management of complex aortic endocarditis. However, there is a paucity of high-quality evidence in the area, and comparison of valve types warrants further investigation.

Keywords

- endocarditis
- aortic valve
- homograft
- aortic root abscess

Williams ML et al: Aorta (Stamford) 2022; 10: 43-51

IE MITRÁLNÍ CHLOPNĚ – MVP vs. MVR?

A Nationwide Study on Mitral Valve Repair vs Replacement for Active Endocarditis

Check for updates

Anton Tomšič, MD, PhD,[1] Arend de Weger, MD,[1] Michelle van der Stoel, MS,[2] Robert J. M. Klautz, MD, PhD,[1] and Meindert Palmen, MD, PhD,[1] on behalf of the Cardiothoracic Surgery Registration Committee of the Netherlands Heart Registration*

ABSTRACT

BACKGROUND Real-world evidence supporting the reproducibility and superiority of valve repair over replacement in active mitral valve infective endocarditis is lacking.

METHODS Data from a prospective nationwide database, including all cardiac surgical procedures in The Netherlands, were used. Adult patients undergoing primary mitral valve intervention who had a diagnosis of active infective endocarditis and who underwent surgery between 2013 and 2020 were included. Survival analysis was performed for the whole follow-up period as well as after applying the landmark of 90 days.

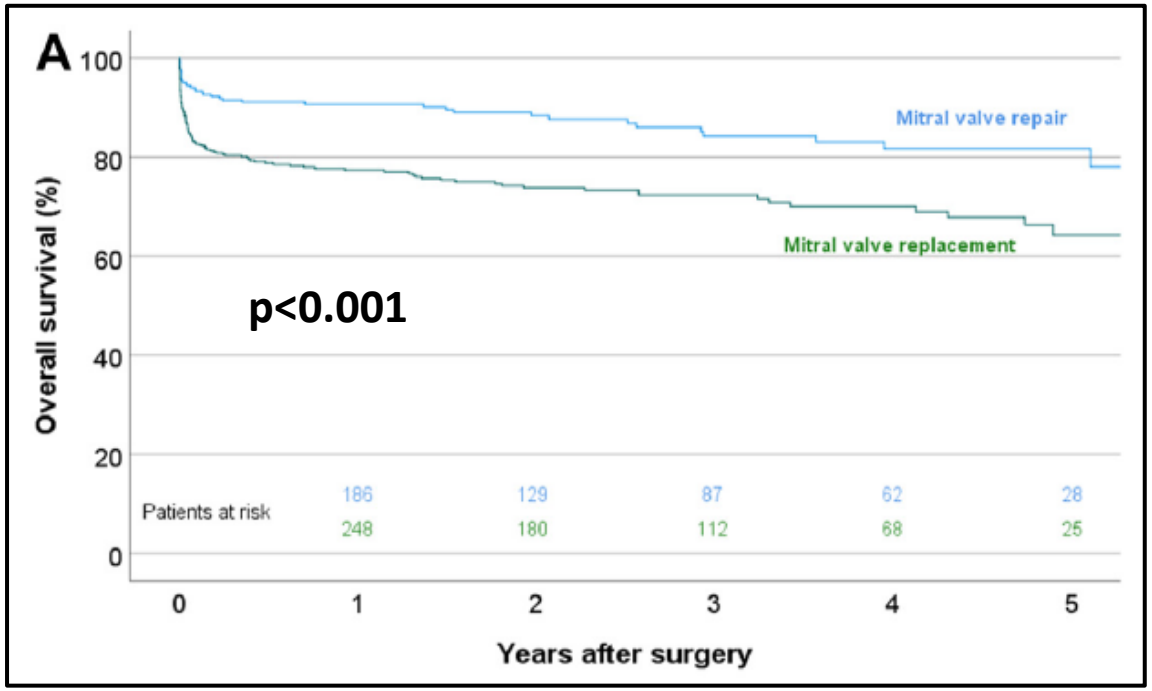
RESULTS Of 715 patients who met the inclusion criteria, 294 (41.1 %) underwent valve repair. Mitral valve repair rates decreased slightly over the course of the study. The early mortality rate was 13.0%, and a trend of steadily declining early mortality rates over the course of the study, despite a steady increase in patient complexity, was observed. On risk-adjusted analysis, mitral valve replacement demonstrated inferior results when compared with valve repair (adjusted hazard ratio, 2.216; 95% CI, 1.425-3.448; $P < .001$), even after a landmark analysis was performed (adjusted hazard ratio 2.489; 95% CI, 1.124-5.516; $P = .025$). These results were confirmed by a propensity score–adjusted analysis (adjusted hazard ratio 2.251; 95% CI, 1.029-4.21; $P = .042$).

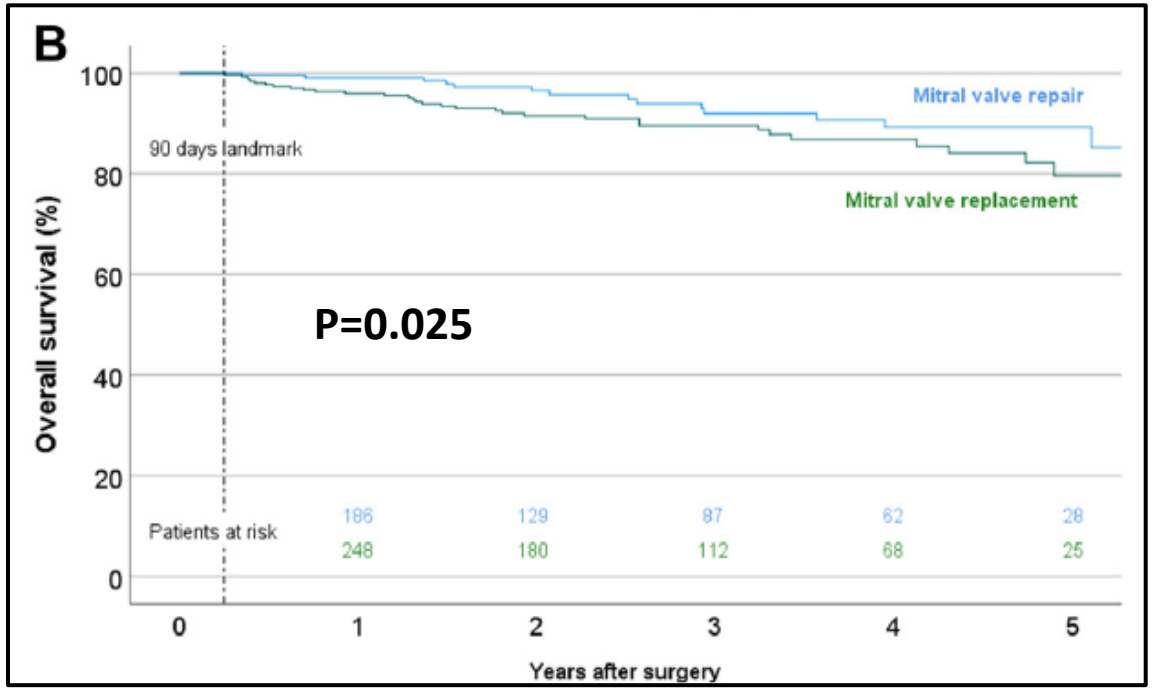
CONCLUSIONS Contemporary trends in mitral valve surgery for active infective endocarditis suggest growing patient complexity but slightly declining early mortality rates. A trend of decreasing mitral valve repair rates was seen. The results of this study suggest improved late outcomes of valve repair compared with valve replacement.

Tomšič A et al:Ann ThoracSurg 2024; 117: 120-7

IE Z POHLEDU KARDIOCHIRURGA

IE MITRÁLNÍ CHLOPNĚ – MVP vs. MVR?





Tomšič A et al:Ann ThoracSurg 2024; 117: 120-7

IE MITRÁLNÍ CHLOPNĚ – MVP vs. MVR?

CLINICAL RESEARCH

Mitral valve repair is better than mitral valve replacement in native mitral valve endocarditis: Results from a prospective matched cohort☆

La réparation valvulaire mitrale donne de meilleurs résultats que le remplacement valvulaire mitral dans l'endocardite mitrale native : résultats d'une cohorte prospective

Léopold Oliver[a], Marie Leauthier[a], Matthieu Jamme[b], Florent Arregle[a], Helene Martel[a], Mary Philip[a], Frederique Gouriet[c], Jean Paul Casalta[c], Olivier Torras[a], Anne-Claire Casalta[a], Laurence Camoin-Jau[c,d], Flora Lavagna[a], Sebastien Renard[a], Pierre Ambrosi[a], Hubert Lepidi[c], Frederic Collart[e], Sandrine Hubert[a], Michel Drancourt[c], Didier Raoult[c], Alberto Riberi[e], Gilbert Habib[a,c,*,1]

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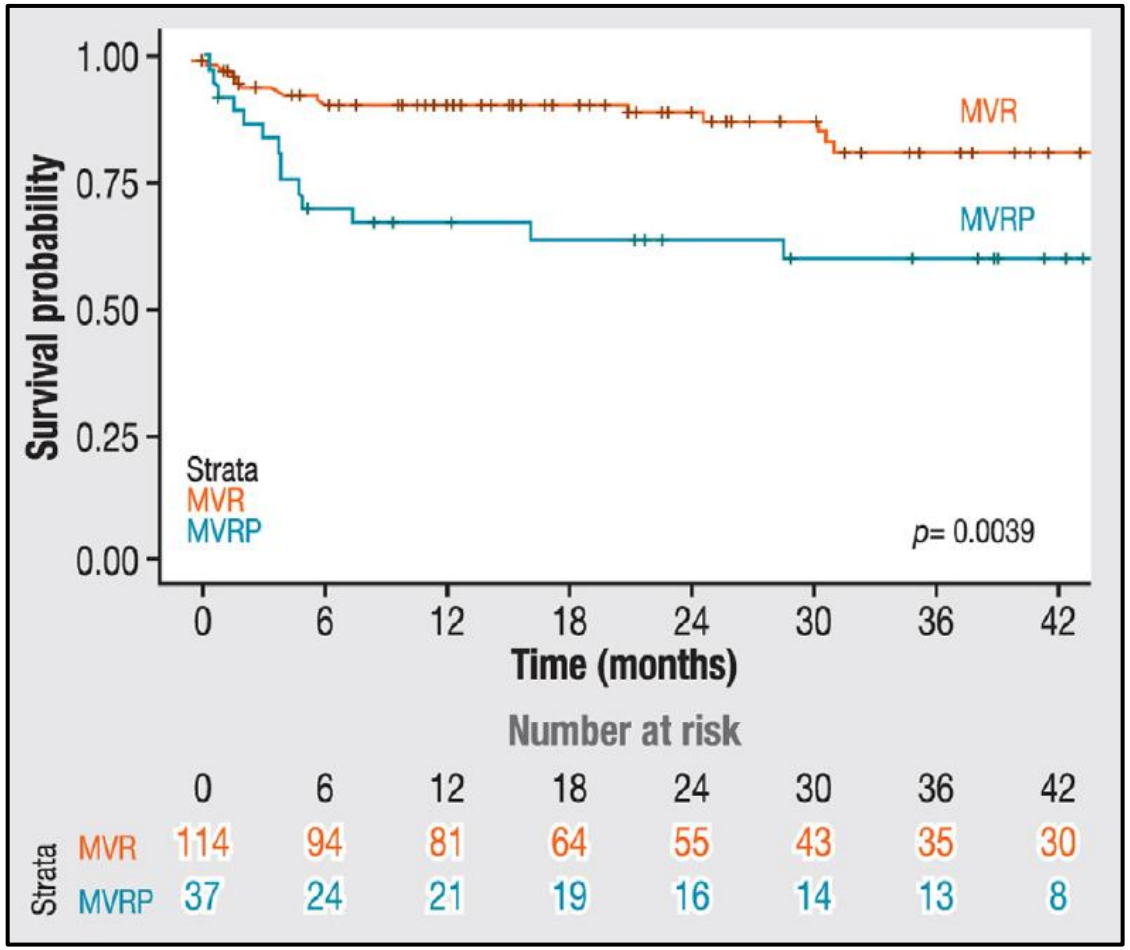
Oliver L A et al: Arch Cardiovasc Dis 2022 (115); 160-168

IE MITRÁLNÍ CHLOPNĚ – MVP vs. MVR?



- IE mitrální chlopně
- Mezi roky 2010 – 2017
- 152 pacientů
  - 115 (75,7%) MVP
  - 37 (24,3%) MVR
- 75% operací v aktivní fázi
- 25,7% operací urgentních
- Medián sledování 28 ± 22 měsíce
- Celková inhospitalizační mortalita 7,3%

Oliver L A et al: Arch Cardiovasc Dis 2022 (115); 160-168

IE MITRÁLNÍ CHLOPNĚ – MVP vs. MVR?

Valve replacement or repair in native mitral valve infective endocarditis—Which is better? A meta-analysis and systematic review

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IE MITRÁLNÍ CHLOPNĚ – MVP vs. MVR?

Abstract

Background: Native mitral valve infective endocarditis (IE) plagues patients and surgeons alike because of its high mortality and recurrence rates as well as poor prognosis. Mitral valve repair (MVP) and mitral valve replacement (MVR) are two main surgical methods. However, the question of which benefits patients more remains controversial. Thus, we conducted a meta-analysis to systematically review the two approaches, focusing on the early survival rate and long-term outcomes.

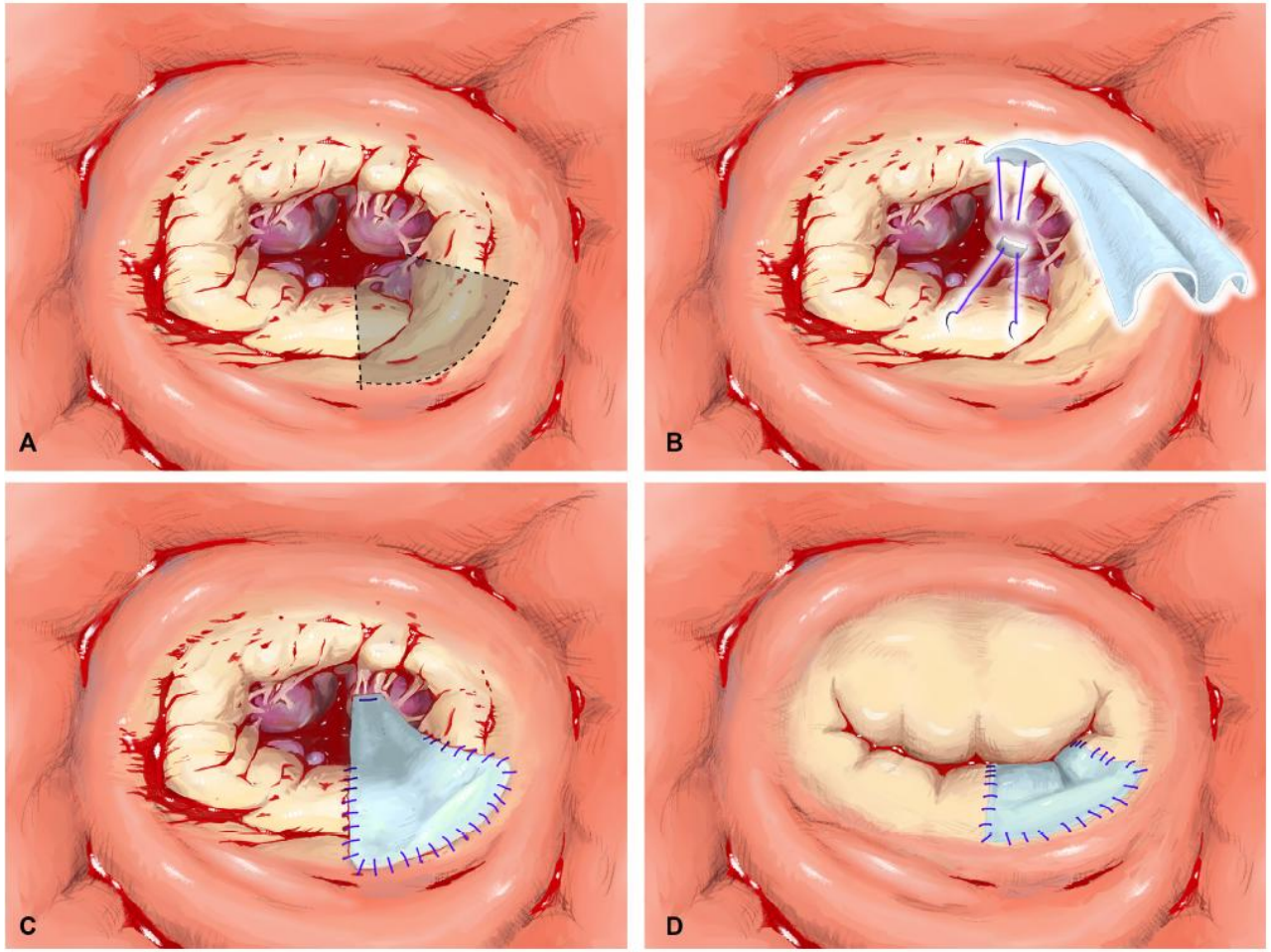
Methods: A meta-analysis and systematic review were conducted using studies sourced from the PubMed, Embase, and Cochrane literature databases to compare MVP and MVR, with data extracted for baseline characteristics, mortality, survival, recurrent endocarditis, and valve reoperation. Risk ratio (RR) or hazard ratio (HR) values were calculated, and publication bias was tested.

Results: A total of 17 relevant publications with a total population of 3759 patients, with 1180 patients having undergone MVP and 2579 patients having undergone MVR, respectively, were analyzed. Patients who underwent MVP may benefit from a lower risk of early mortality (RR, 0.51; 95% confidence interval [CI], 0.39–0.66; $p < .00001$), a higher long-term survival rate (HR, 0.69; 95% CI, 0.58–0.81; $p < .001$; $I^2 = 0\%$), and a lower risk of recurrence (RR, 0.66; 95% CI, 0.40–1.09; $p = .10$; $I^2 = 0\%$). However, a similar risk of reoperation was observed for both groups (RR, 1.02; 95% CI, 0.36–2.91; $p = .96$; $I^2 = 43\%$).

Conclusion: This meta-analysis suggests that MVP may lead to better outcomes compared to MVR. Among patients with mitral valve IE, MVP can reduce in-hospital mortality, improve long-term survival, and has a lower risk of recurrent endocarditis. As a result, MVP may be suitable as a primary treatment choice and should be considered whenever possible in most IE patients.

He K et al: J Card Surg 2022 (37); 1004-1015

IE MITRÁLNÍ CHLOPNĚ – MVP – chirurgická technika



Hosoba S et al: JTCVS Techniques 2022 (16);35-42

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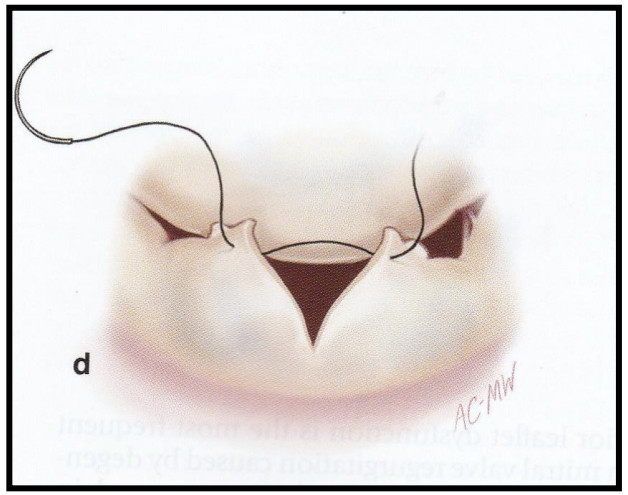
Principy dle Carpentiera – chirurgická technika



KOREKCE LÉZE !!!!!!

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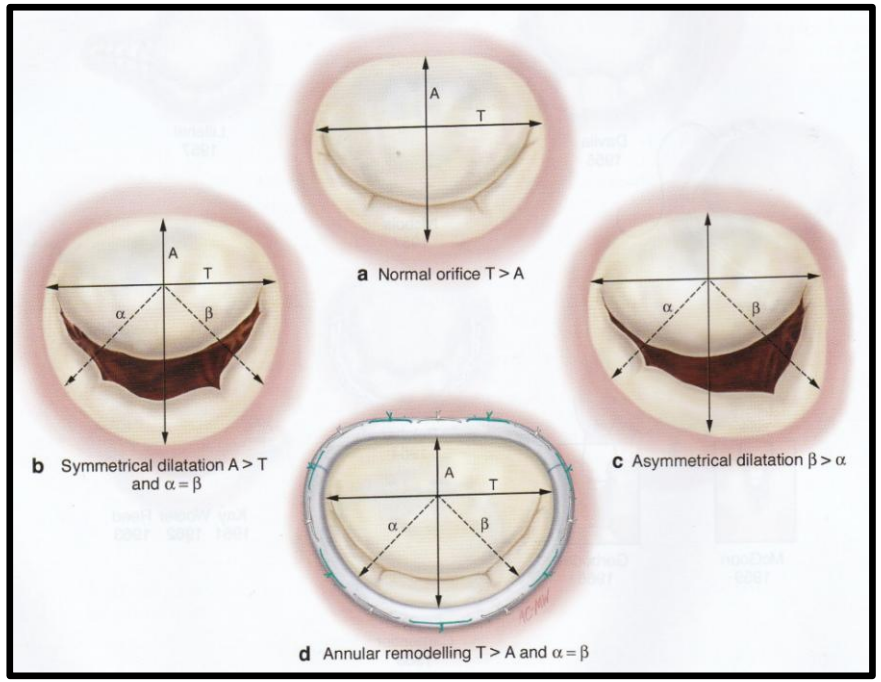
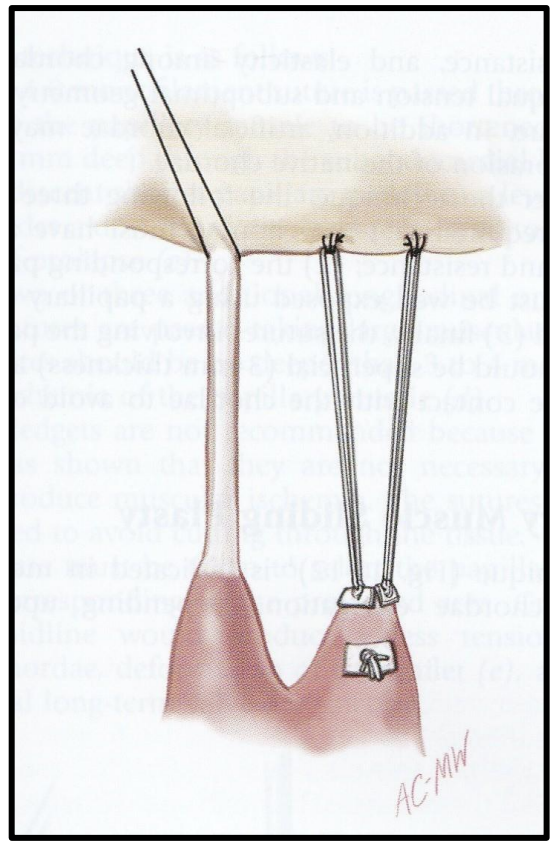
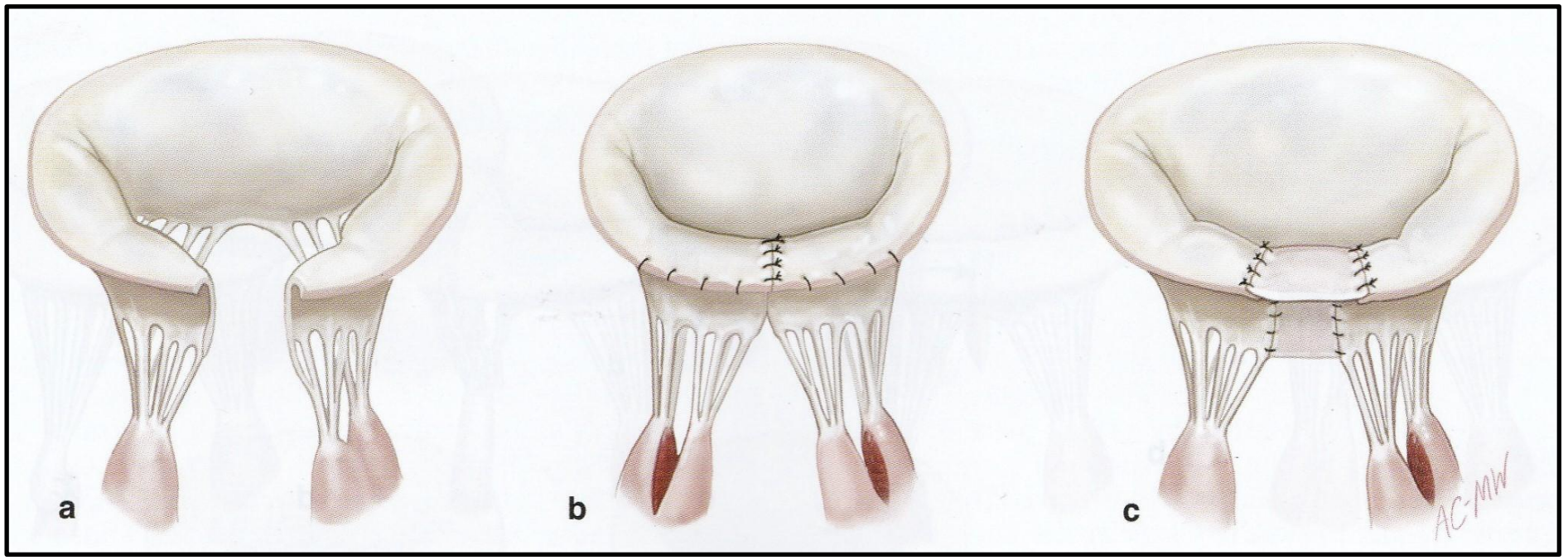




Carpentier A, Adams DH, Filsoufi F, Saunders Elsevier 2010

KOREKCE LÉZE – TYP I – defekt zadního cípu

Náhrada zadního cípu nativním perikardem



Carpentier A, Adams DH, Filsoufi F, Saunders Elsevier 2010

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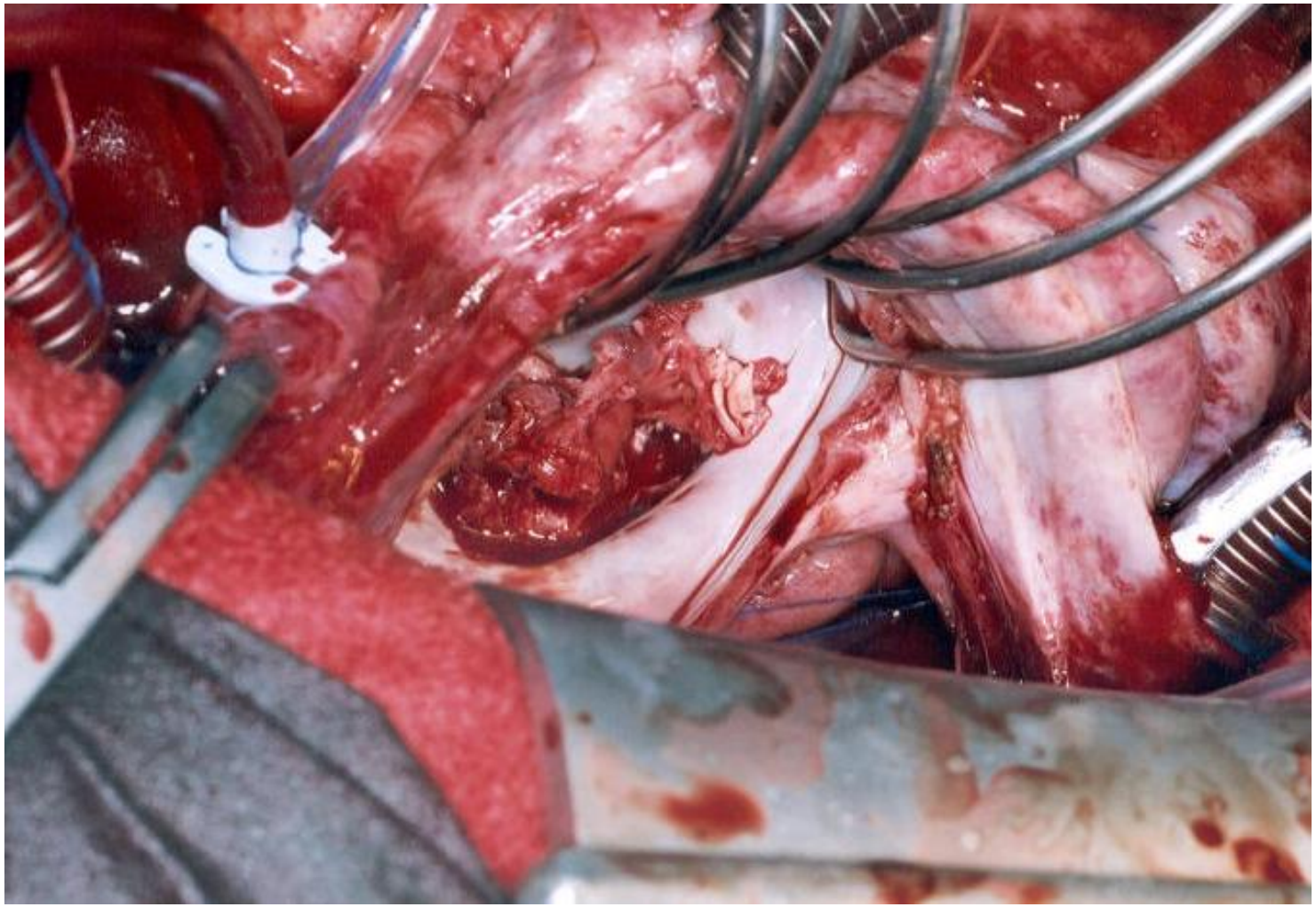
KOREKCE LÉZE – TYP I – defekt zadního cípu



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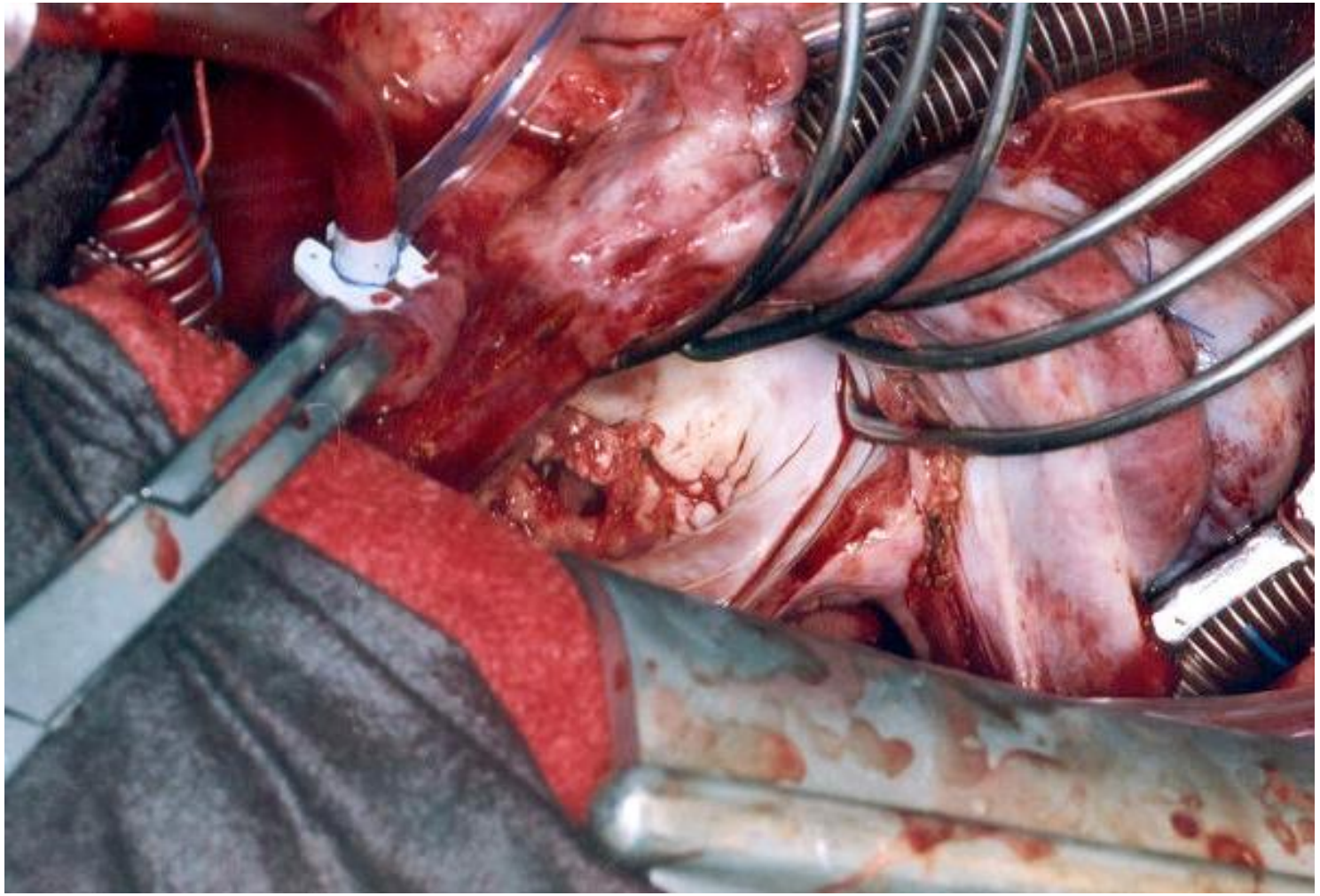
KOREKCE LÉZE – TYP I – defekt zadního cípu



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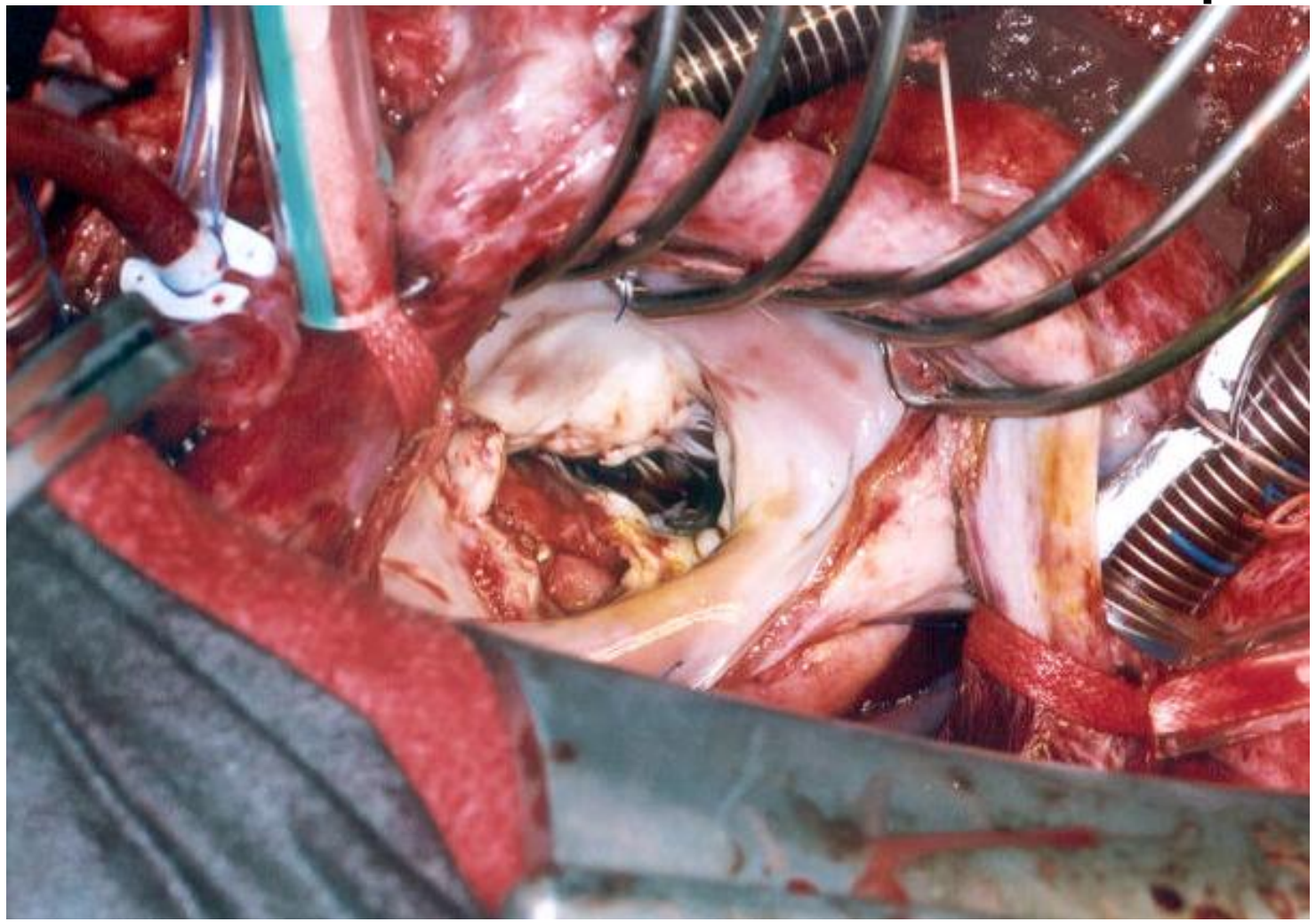

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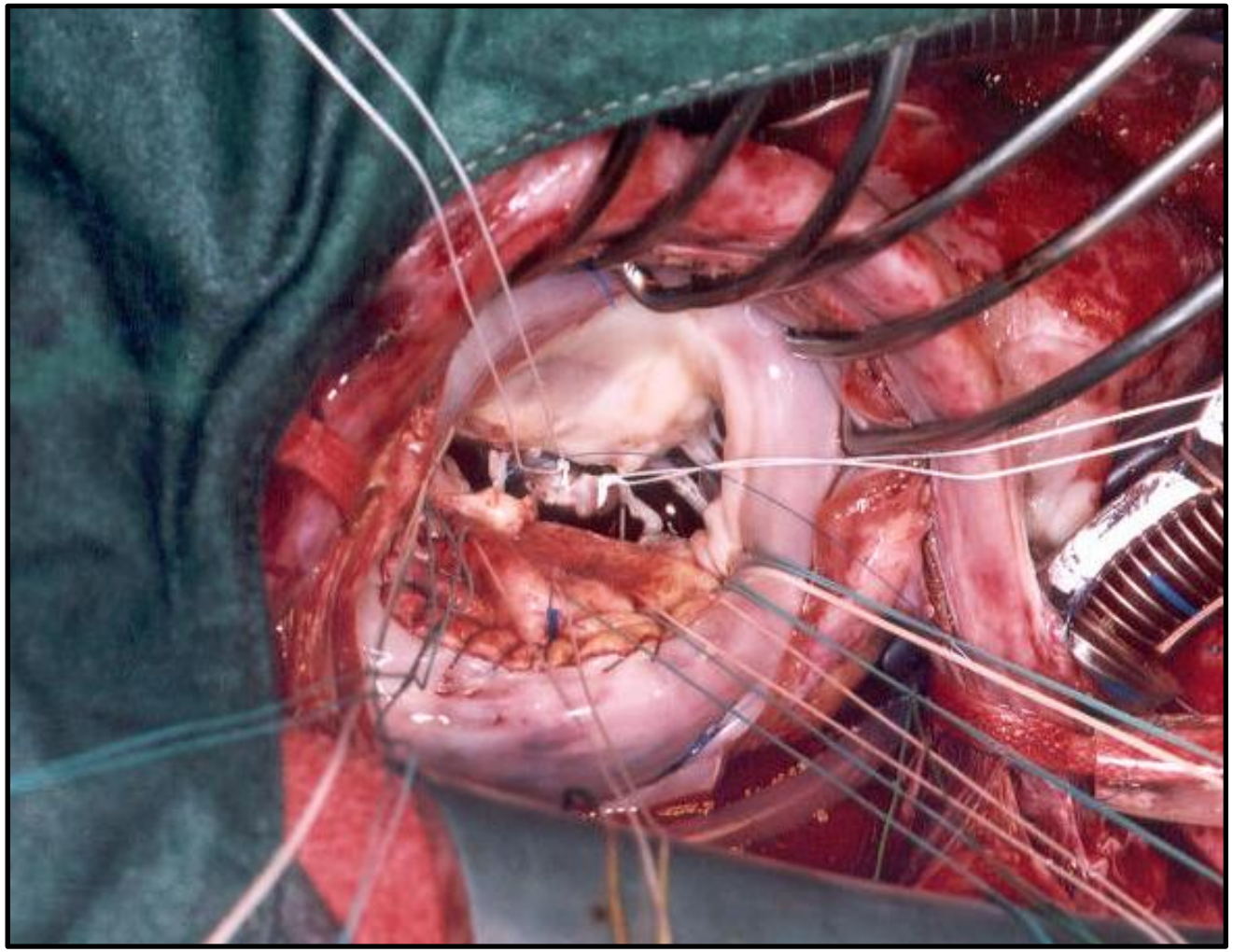

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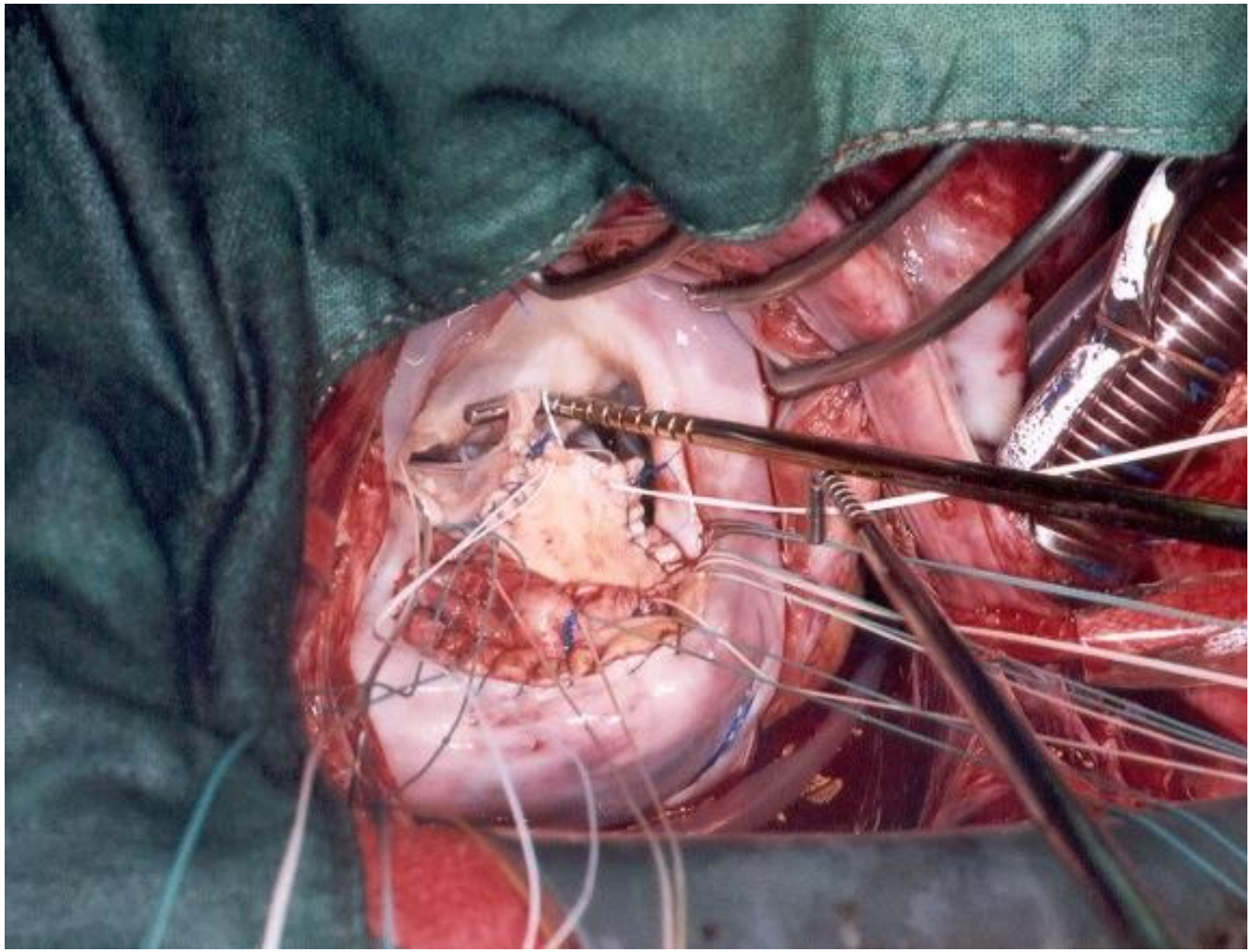
KOREKCE LÉZE – TYP I – defekt zadního cípu



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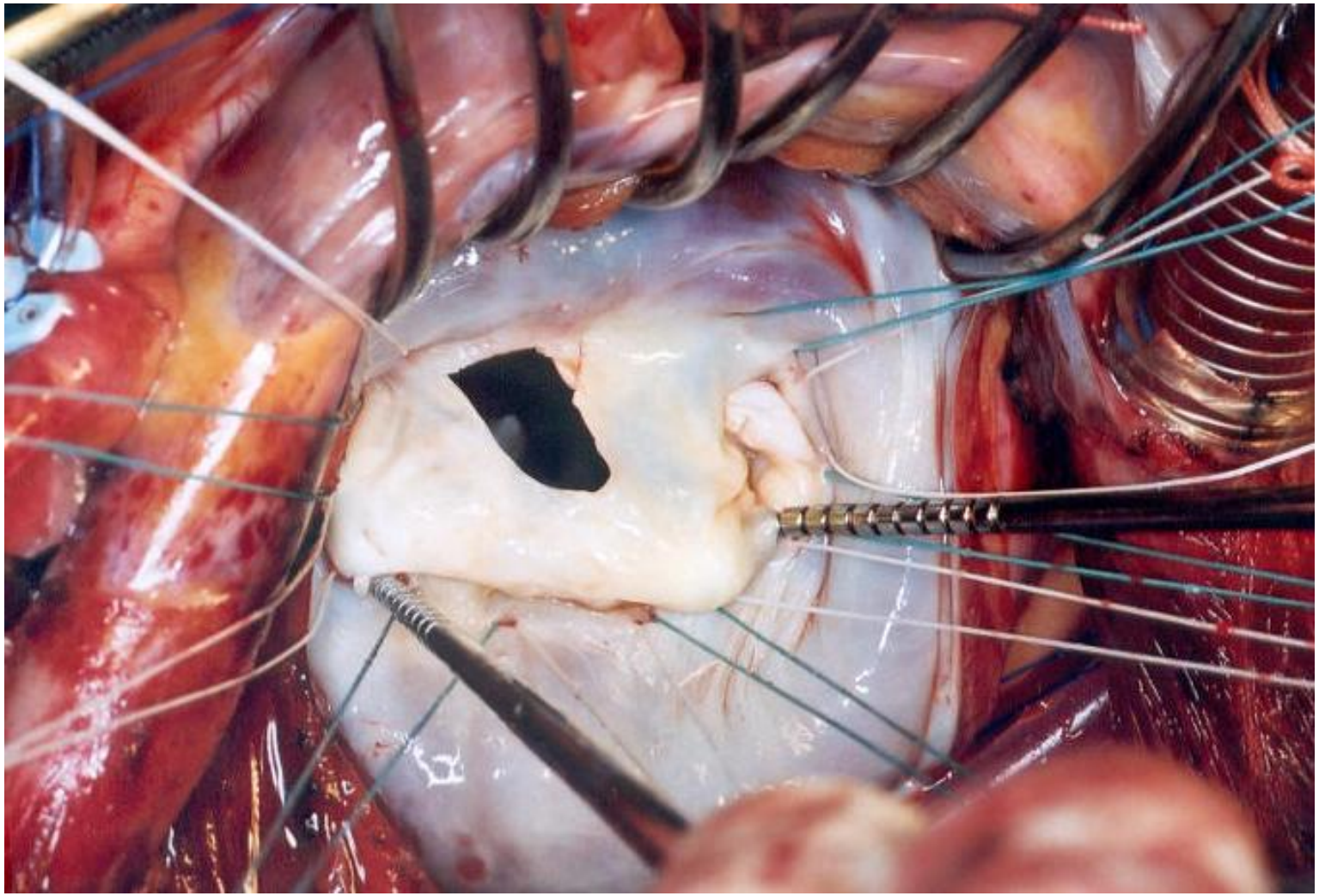
KOREKCE LÉZE – TYP I + II – perforace + prolaps předního cípu



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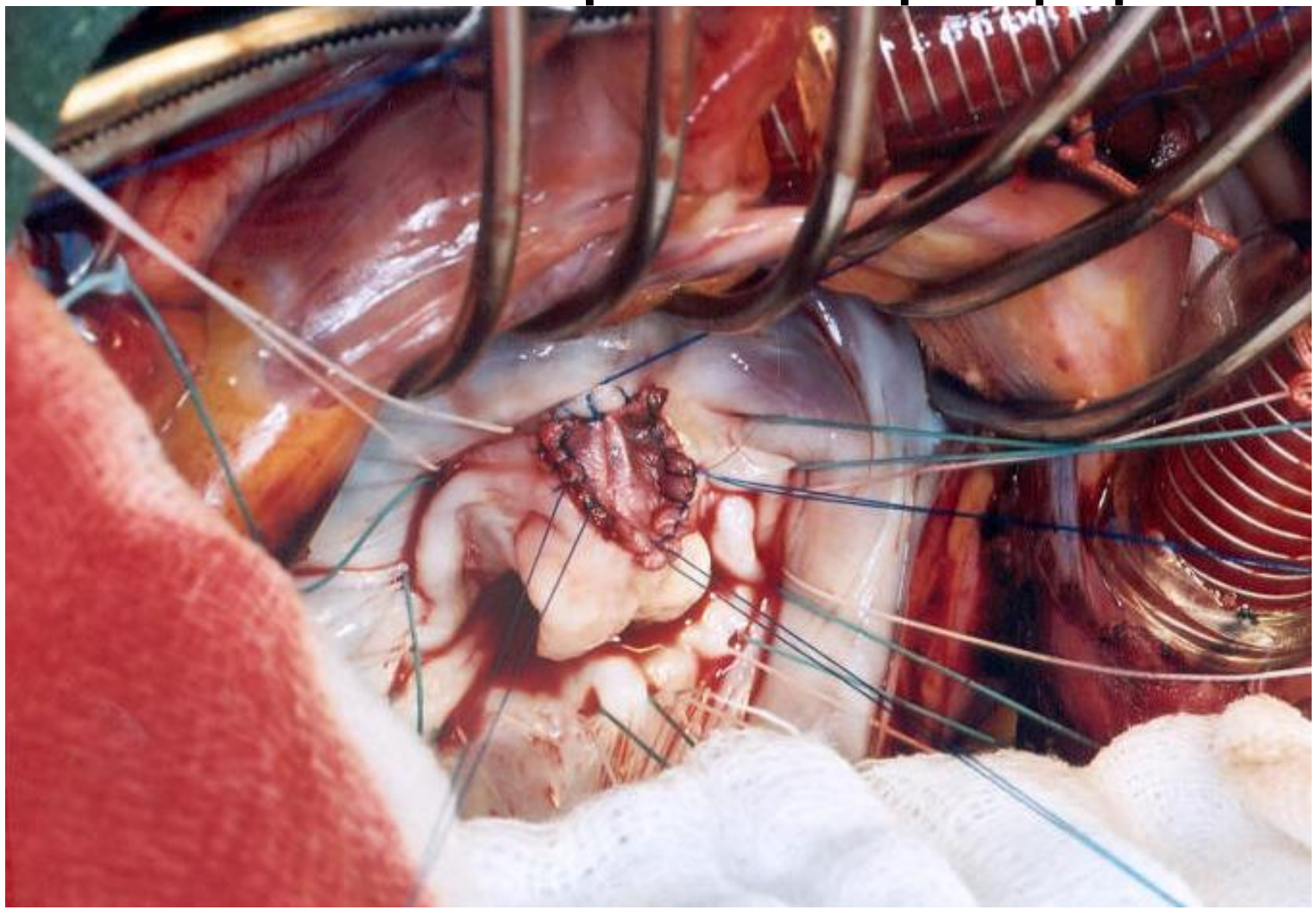
KOREKCE LÉZE – TYP I + II – perforace + prolaps předního cípu



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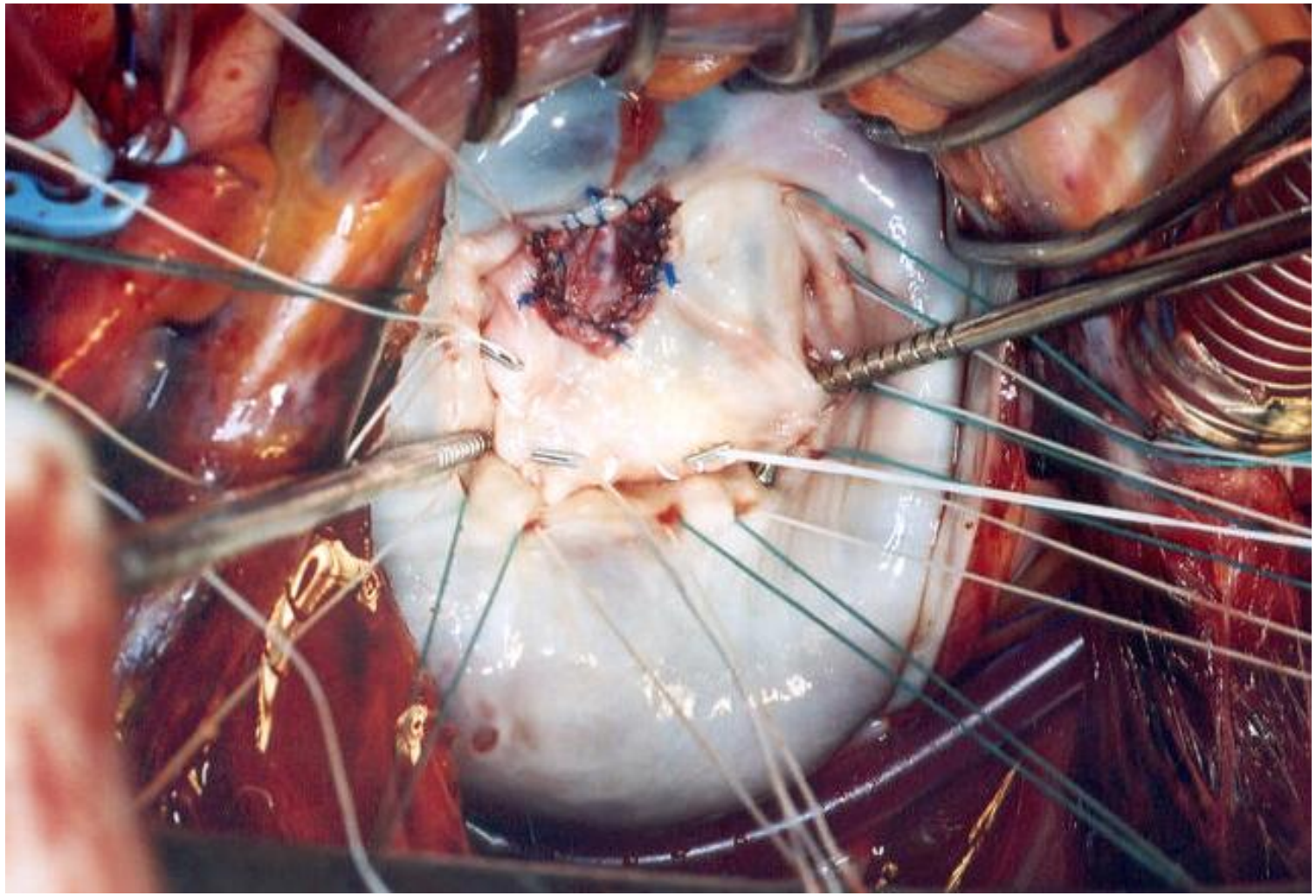
KOREKCE LÉZE – TYP I + II – perforace + prolaps předního cípu



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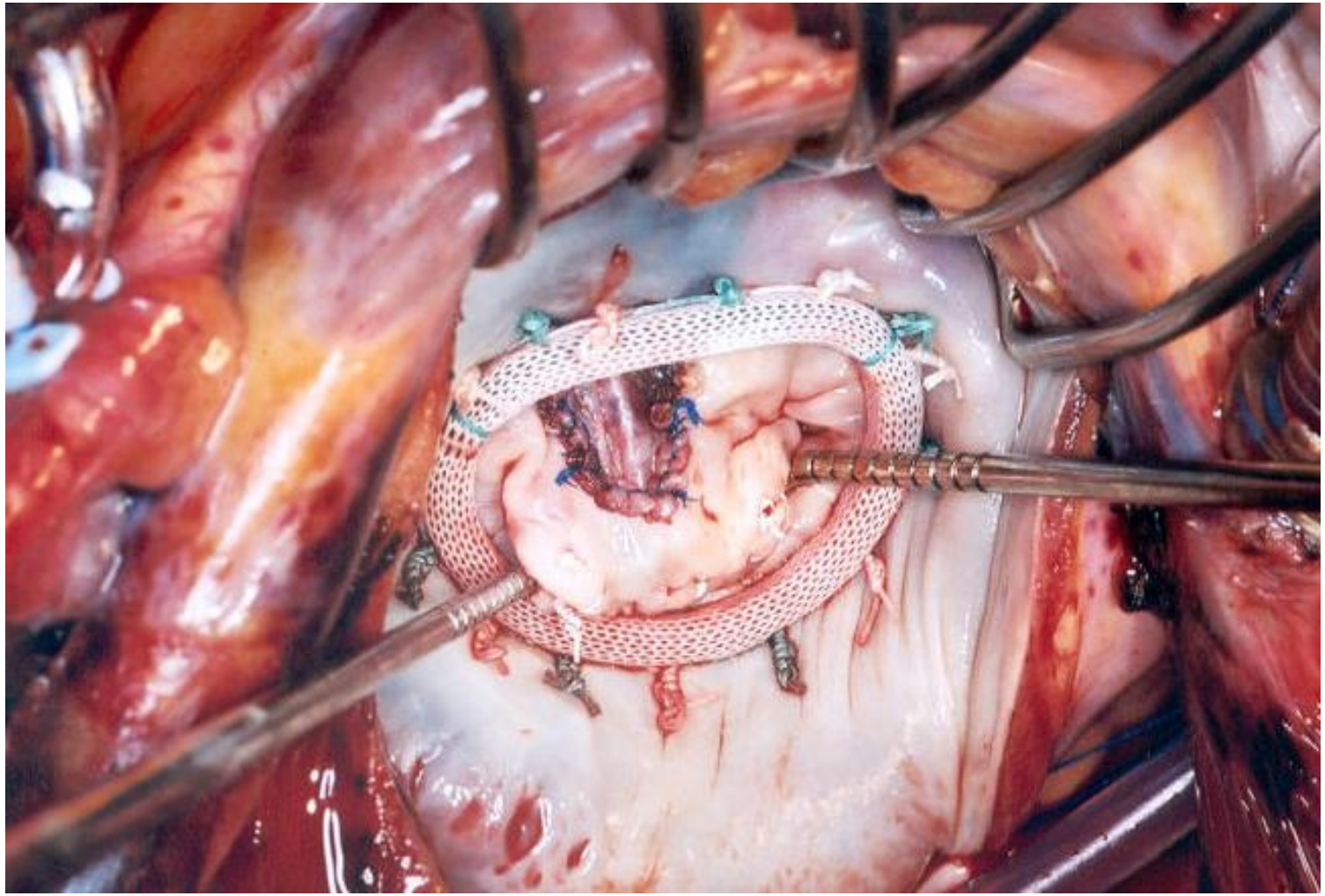
KOREKCE LÉZE – TYP I + II – perforace + prolaps předního cípu



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ZÁVĚRY

- **IE zůstává velmi závažným onemocněním**
- **Recentní guidelines ESC přínášejí řadu nových pohledů na léčbu IE, nicméně konzervativní léčba zůstává základní léčebnou strategií**
- **Chirurgie má v léčbě IE místo při rozvoji jinak neřešitelných komplikací – SRDEČNÍM SELHÁNÍ, NEKONTROLOVANÉ INFEKCI, RIZIKU POKRAČUJÍCÍCH EMBOLIZACÍ**
- **V takovém případě je nutný aktivní přístup a existuje jen málo kontraindikací výkonu**
- **Při postižení aortální chlopně je často nutná náhrada chlopně, neexistuje ideální náhrada i když aortální homografty teoreticky nabízejí některé výhody jako např. větší rezistenci k reinfekci**
- **Při postižení mitrální chlopně by preferovaným typem zákroku měla být plastika chlopně**

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Děkuji za pozornost!!!

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