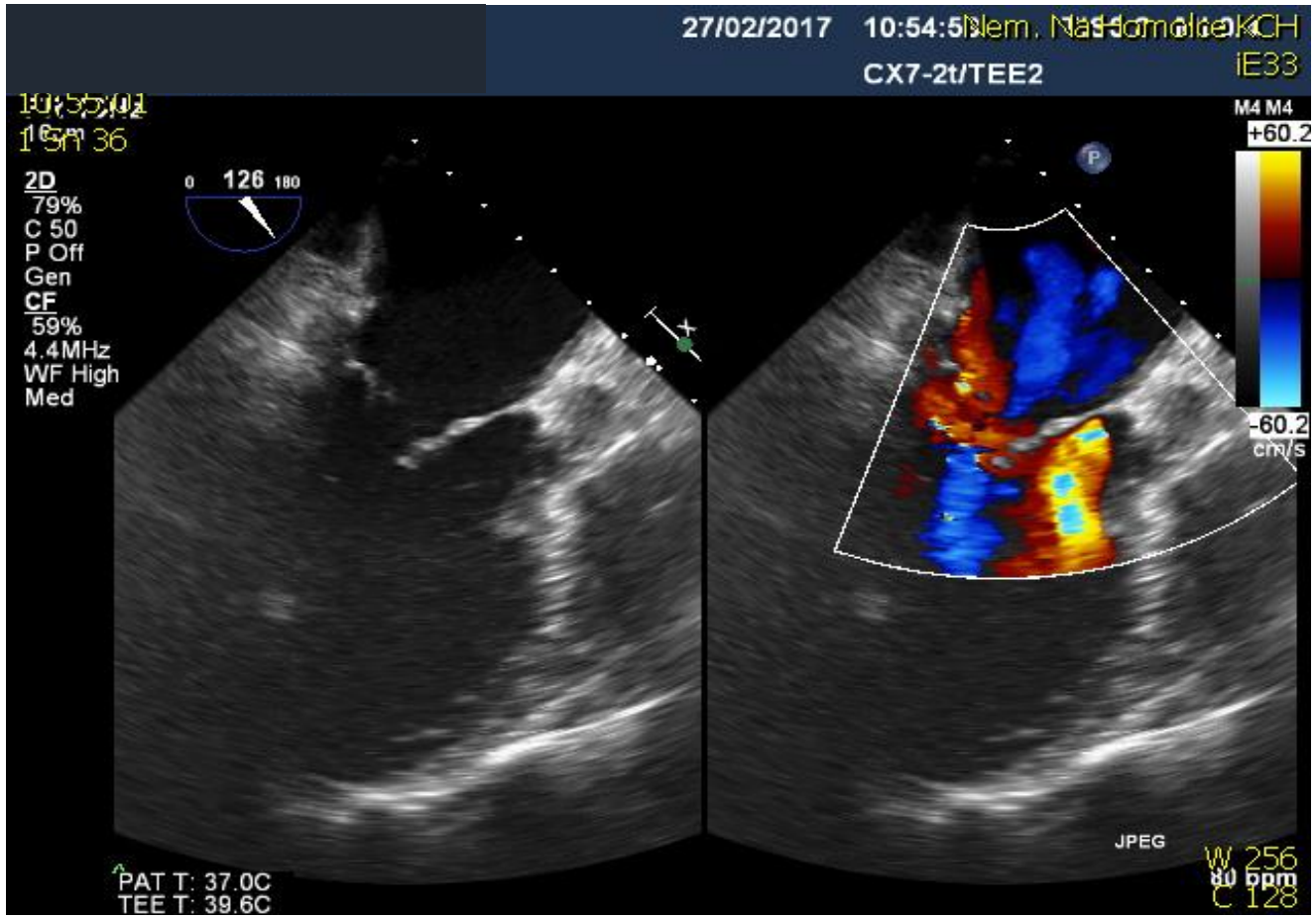
MINIVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI, METODA VOLBY???

Štěpán ČERNÝ
Nemocnice Na Homolce
Praha

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

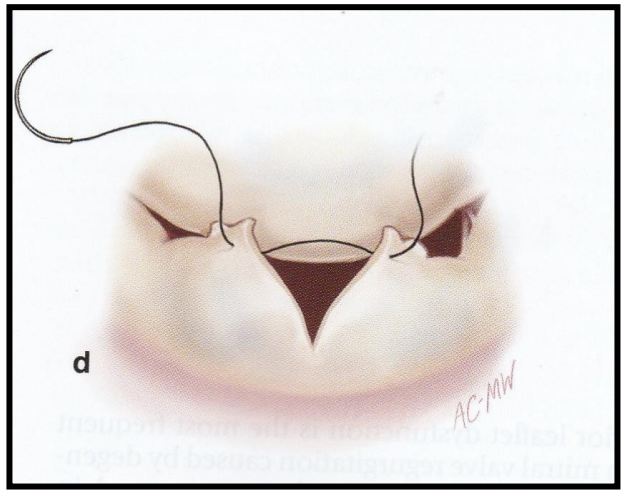
PRIMÁRNÍ MITRÁLNÍ REGURGITACE - TEE



ERO ≥ 0,4 cm² **RV ≥ 60mL**

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

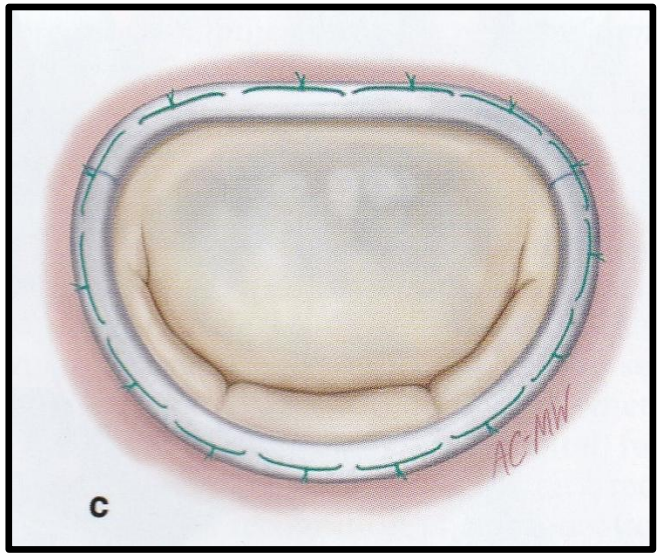
PRIMÁRNÍ MITRÁLNÍ REGURGITACE – CHIRURGICKÁ PLASTIKA

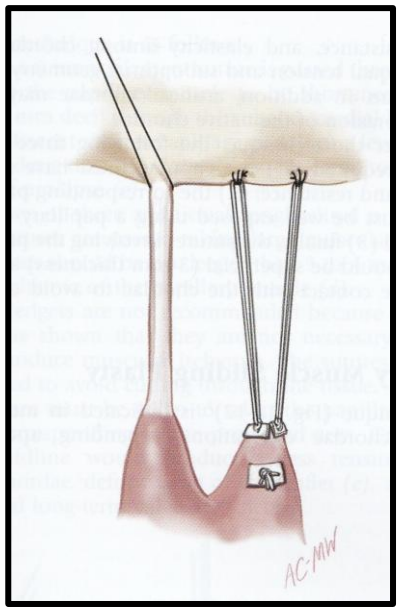


KOREKCE LÉZE !!!!!!

+

REMODELACE ANULU !!!!!!





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

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

VELMI NÍZKÁ MORTALITA U IZOLOVANÉ PLASTIKY MITRÁLNÍ CHLOPNĚ

Increasing Disadvantage of "Watchful Waiting" for Repairing Degenerative Mitral Valve Disease

Farhang Yazdchi, MD, MS, Colleen G. Koch, MD, MS, Tomislav Mihaljevic, MD, Rory Hachamovitch, MD, Ashley M. Lowry, MS, Jiayan He, ScD, A. Marc Gillinov, MD, Eugene H. Blackstone, MD, and Joseph F. Sabik, III, MD

Departments of Thoracic and Cardiovascular Surgery, Cardiothoracic Anesthesia, and Cardiovascular Medicine, Heart and Vascular Institute; and Department of Quantitative Health Sciences, Research Institute, Cleveland Clinic, Cleveland, Ohio

Background. Successful durable repair of severe degenerative mitral regurgitation with low operative mortality encourages intervention in asymptomatic patients rather than "watchful waiting." Our objectives were to assess trends in patient characteristics, tim[illegible] of intervention, and evolving surgical techniqu[illegible] a high-volume center, and determine effects of [illegible]ese changes on outcomes after mitral valve (MV) repair [illegible]a 2[illegible]ye period.

Methods. From January 1, 1985, to January 1, 2011, 5,902 patients underwent isolated repair (with or without tricuspid repair for functional regurgitation) for degenerative MV disease at Cleveland Clinic. For illustration, the experience is presented in 3 eras: 1985 to 1997 (era 1, n = 1,184), 1997 to 2005 (era 2, n = 2,400), and 2005 to 2011 (era 3, n = 2,318).

Results. In era 3, more patients were asymptomatic on presentation (44% in New York Heart Association [NYHA] class I vs 25% in era 1), with less heart failure (11% vs 29%) and atrial fibrillation (9.9% vs 23%). Full sternotomy decreased from era 1 (n = 1,100/93%) to era 2 (n = 602/25%) (era 3, n = 717/31%), and robotic surgery emerged (n = 577/25%) in era 3. Median length of stay sh[illegible]ed (e[illegible] = [illegible] days, era 2 = 5.9 days, era 3 = 5.2 d[illegible] < 0.0[illegible], and in-hospital mortality remained low ([illegible] = 5/0.42%, [illegible]2 = 5/0.21%, era 3 = 1/0.043%); 0.[illegible] overall [illegible]equ[illegible] reoperation on the repaired valve before discharge, and 97% had 0 to 1+ regurgitation at discharge.

Conclusions. Treatment trends over 25 years reveal that rather than watchful waiting, a more aggressive approach to degenerative MV disease, with earlier intervention for severe regurgitation in asymptomatic patients and less invasive operative techniques, is successful, safe, and effective.

(Ann Thorac Surg 2015;■:■–■)

0,18%

Yazdchi F et al: *Ann Thorac Surg 2015*;99(6):1992-2000

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

REPARABILITA MCH SE VE SPECIALIZOVANÝCH CENTRECH BLÍŽÍ 100%

A near 100% repair rate for mitral valve prolapse is achievable in a reference center: Implications for future guidelines

Javier G. Castillo, MD, Anelechi C. Anyanwu, MD, Valentin Fuster, MD, PhD, and David H. Adams, MD

Background: Although mitral valve repair is the recommended treatment for severe mitral regurgitation of degenerative etiology, valve replacement remains common, particularly for complex lesions or anterior leaflet involvement. We sought to characterize the feasibility and outcomes of an "all comers" repair strategy applied systematically in all cases of degenerative mitral valve disease, regardless of age, complexity, or leaflet involvement.

Methods: From January 2002 to December 2010, 744 consecutive patients (mean age, 58 ± 13 years [range, 12-90]; mean LVEF, 55% ± 9%) with degenerative mitral valve regurgitation and prolapse (anterior leaflet: n = 42, 6%; posterior leaflet: n = 5[illegible], [illegible]% bi[illegible]aflet: [illegible] = 46, [illegible]%) underwent mitral valve surgery. Annular, leaflet or chordal calcification was present in [illegible]% of cases.

Results: All patients underwent mitral valve repair and received a concomitant annuloplasty with a median ring size of 32 mm (interquartile range, 30-36). There was 1 early valve replacement (99.9% repair rate) due to atrioventricular groove bleeding and 5 late re-repairs (0.7%) due to disease progression or infective endocarditis. In-hospital mortality and major stroke rates were 0.8% and 0.5%, respectively. Survival rates at 1 and 5 years were 99.2% ± 0.3% and 97.4% ± 0.8%, respectively. Seven-year freedom from reoperation was 97.1% ± 0.6%. The estimate of patients with <3+ mitral regurgitation at 4 and 7 years was 98% and 96%, respectively, and 95% and 91%, respectively, for <2+ mitral regurgitation.

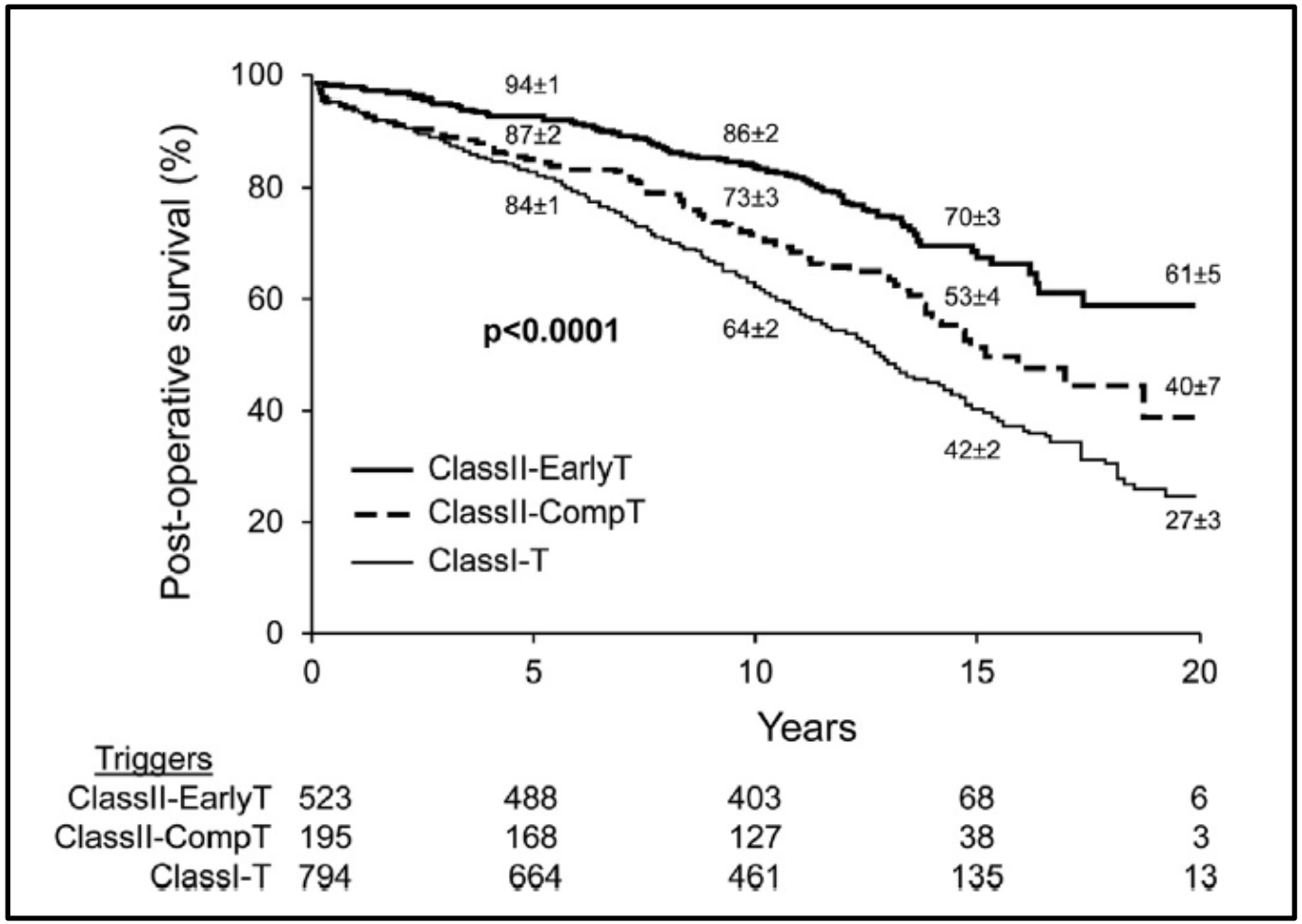
Conclusions: A systematic strategy of mitral valve repair that uses a variety of techniques allows repair of all degenerative valves in a reference center, with good short-term outcomes and mid-term durability. Further study is required to document the long-term efficacy of an "all comers" mitral valve repair strategy in degenerative subgroups with very complex valve morphology. (J Thorac Cardiovasc Surg 2012;144:308-12)

99,9 %

Castilo JG et al: *J Thorac Cardiovasc Surg 2012*;144:318-12

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

PLASTIKA MCH – CLASS I TRIGERY VS. CLAS II TRIGERY



Enriquez-Sarano M et al: *J Thorac Cardiovasc Surg 2015; 1500(1):50-8*

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ESC European Society of Cardiology
European Heart Journal (2021) **00**, 1–72
doi:10.1093/eurheartj/ehab395

ESC/EACTS GUIDELINES

2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

New or Revised	Recommendations in 2017 version	Class	Recommendations in 2021 version	Class
Revised	Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <45 mm and LVEF >60%) and AF secondary to mitral regurgitation or pulmonary hypertension (SPAP at rest >50 mmHg).	IIa	Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <40 mm and LVEF >60%) and AF secondary to mitral regurgitation or pulmonary hypertension (SPAP at rest >50 mmHg).	IIa
Revised	Surgery should be considered in asymptomatic patients with preserved LVEF (>60%) and LVESD 40–44 mm when a durable repair is likely, surgical risk is low, the repair is performed in a Heart Valve Centre and at least one of the following findings is present: • flail leaflet or; • presence of significant LA dilatation (volume index ≥60 mL/m^2 BSA) in sinus rhythm.	IIa	Surgical mitral valve repair should be considered in low-risk asymptomatic patients with LVEF >60%, LVESD <40 mm and significant LA dilatation (volume index ≥60 mL/m^2 or diameter ≥55 mm) when performed in a Heart Valve Centre and a durable repair is likely.	IIa

Vahanian A et al: *Eur Heart J 2021*;00:1-72

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

Recommendations on indications for intervention in severe primary mitral regurgitation

Recommendations	Class[a]	Level[b]
Mitral valve repair is the recommended surgical technique when the results are expected to be durable [293–296].	I	B
Surgery is recommended in symptomatic patients who are operable and not high risk [293–296].	I	B
Surgery is recommended in asymptomatic patients with LV dysfunction (LVESD ≥40 mm and/or LVEF ≤60%) [277, 286, 292].	I	B
Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <40 mm and LVEF >60%) and AF secondary to mitral regurgitation or pulmonary hypertension[c] (SPAP at rest >50 mmHg) [285, 289].	IIa	B
Surgical mitral valve repair should be considered in low-risk asymptomatic patients with LVEF >60%, LVESD <40 mm[a] and significant LA dilatation (volume index ≥60 mL/m^2 or diameter >55 mm) when performed in a Heart Valve Centre and a durable repair is likely [285, 288].	IIa	B
TEER may be considered in symptomatic patients who fulfil the echocardiographic criteria of eligibility, are judged inoperable or at high surgical risk by the Heart Team and for whom the procedure is not considered futile [299–302].	IIb	B

Vahanian A et al: *Eur Heart J 2021*;00:1-72

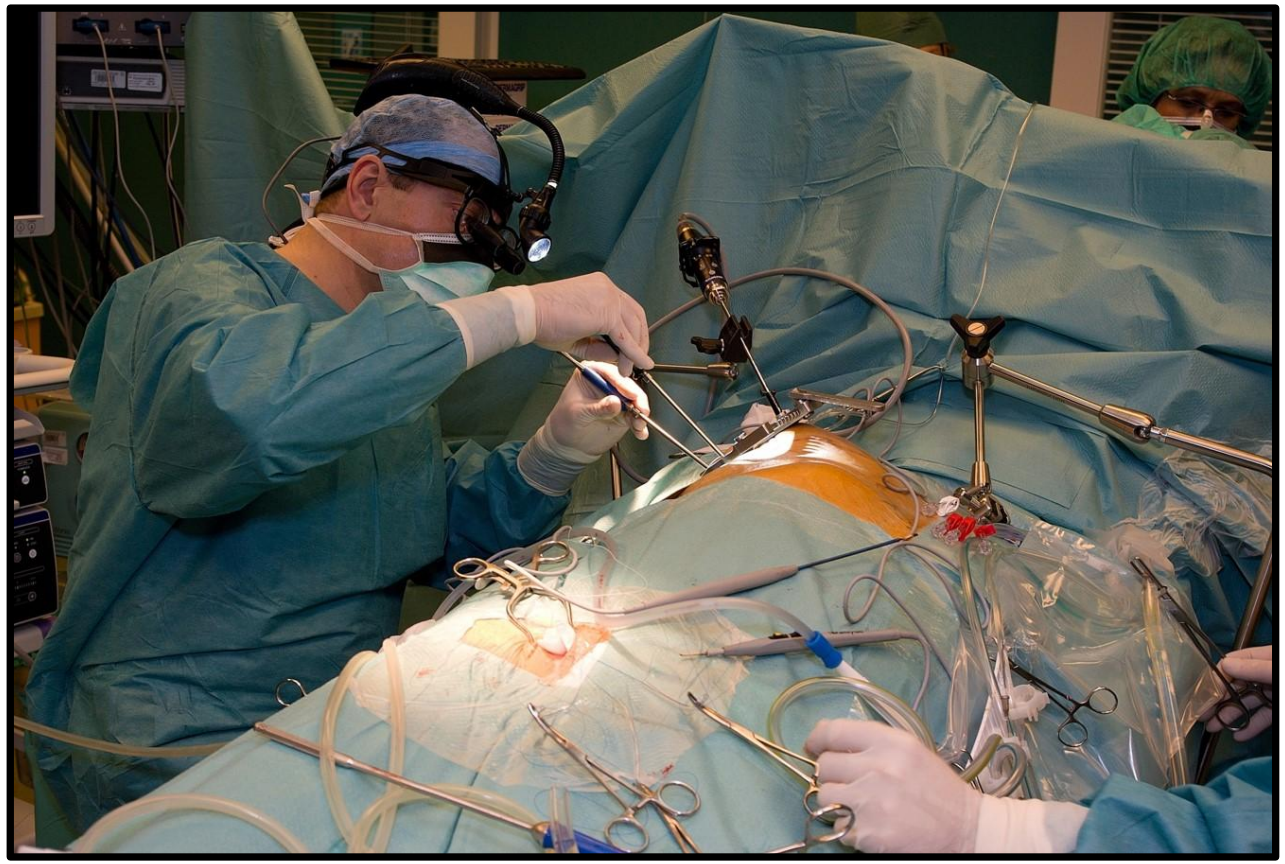
MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

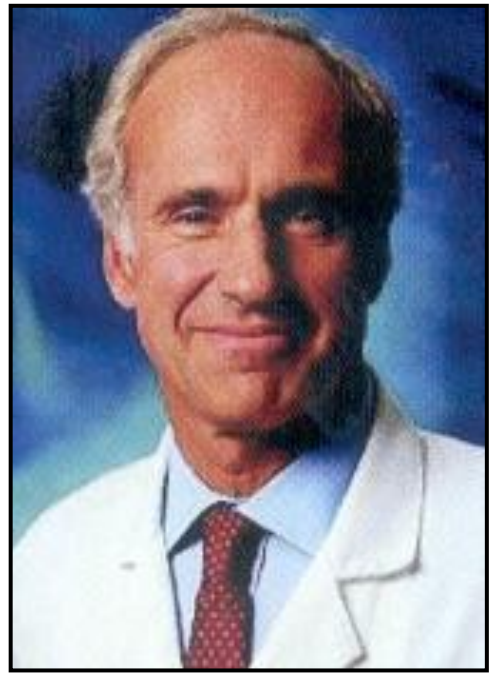
STŘEDNÍ STERNOTOMIE

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH

F. Mohr

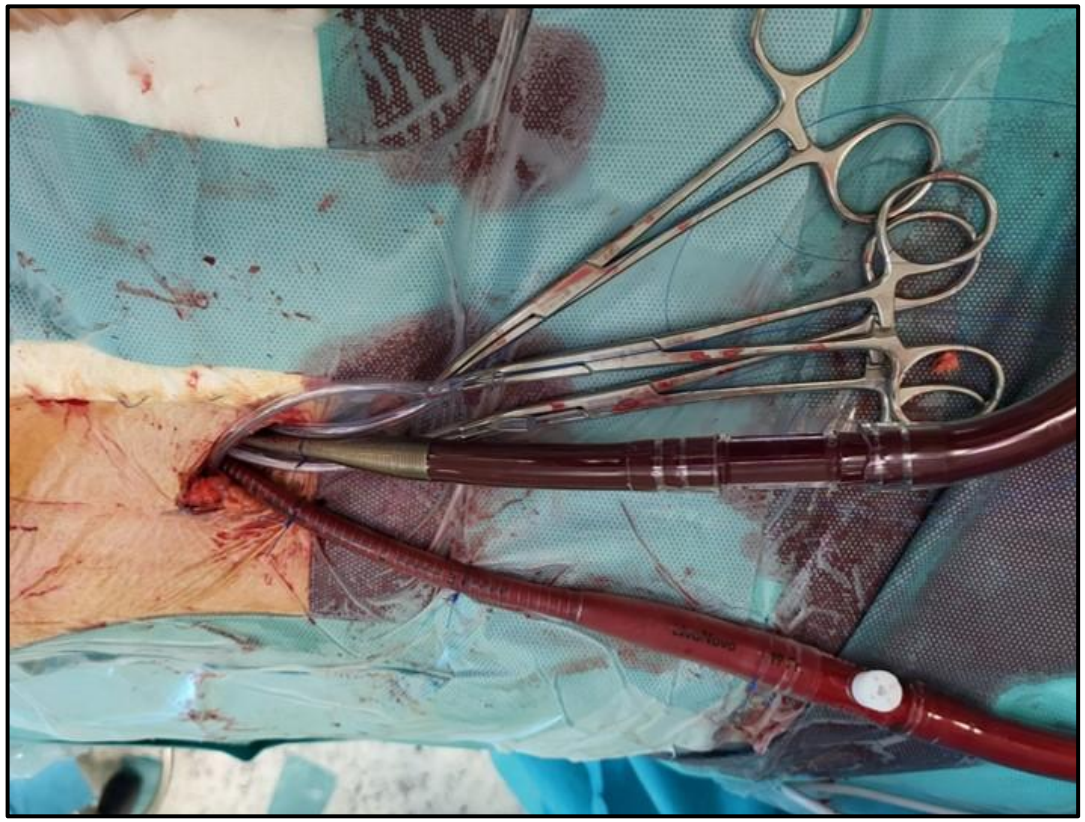




H. Vanermen

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – KANYLACE MO

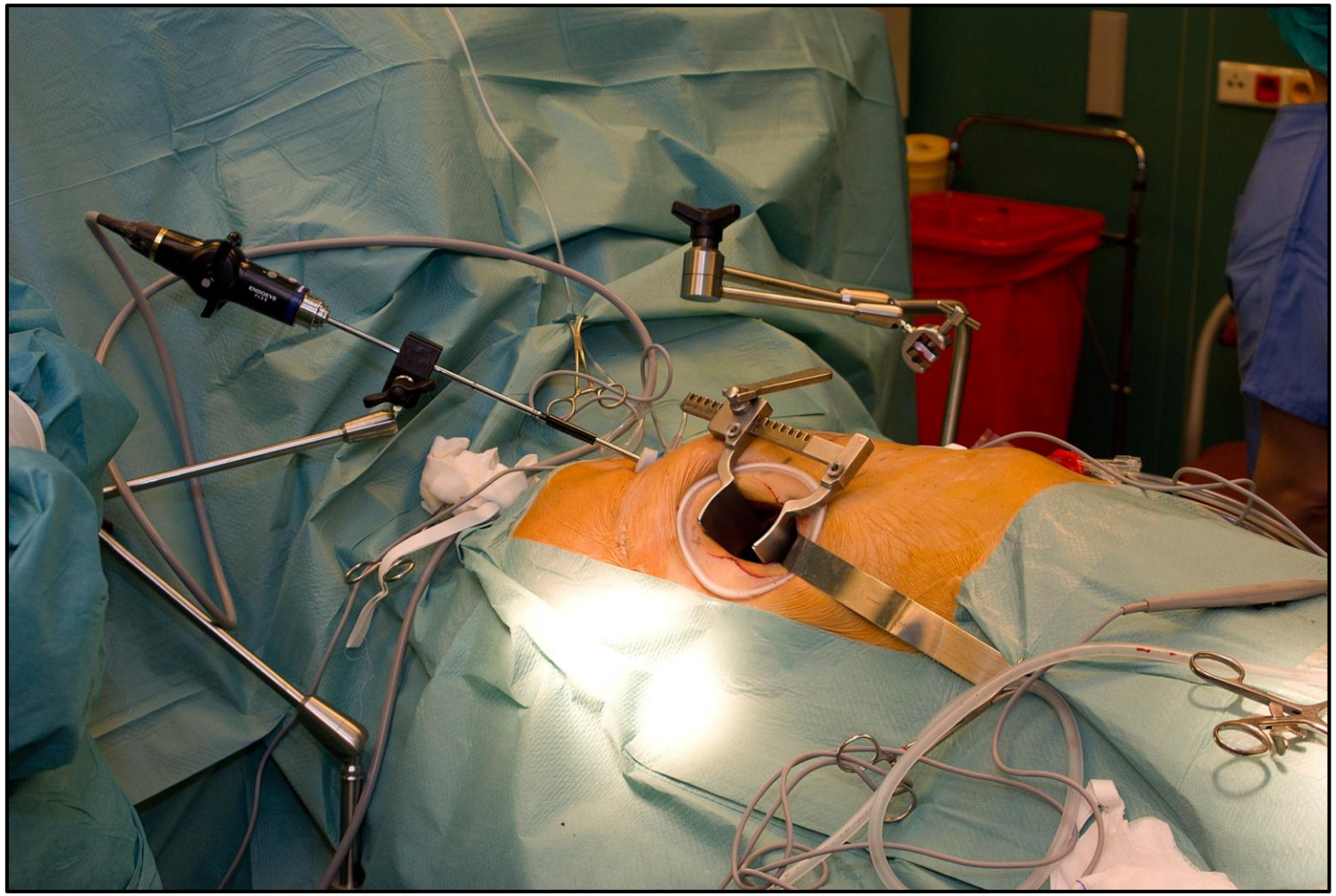


MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – CHIRURGICKÝ PŘÍSTUP

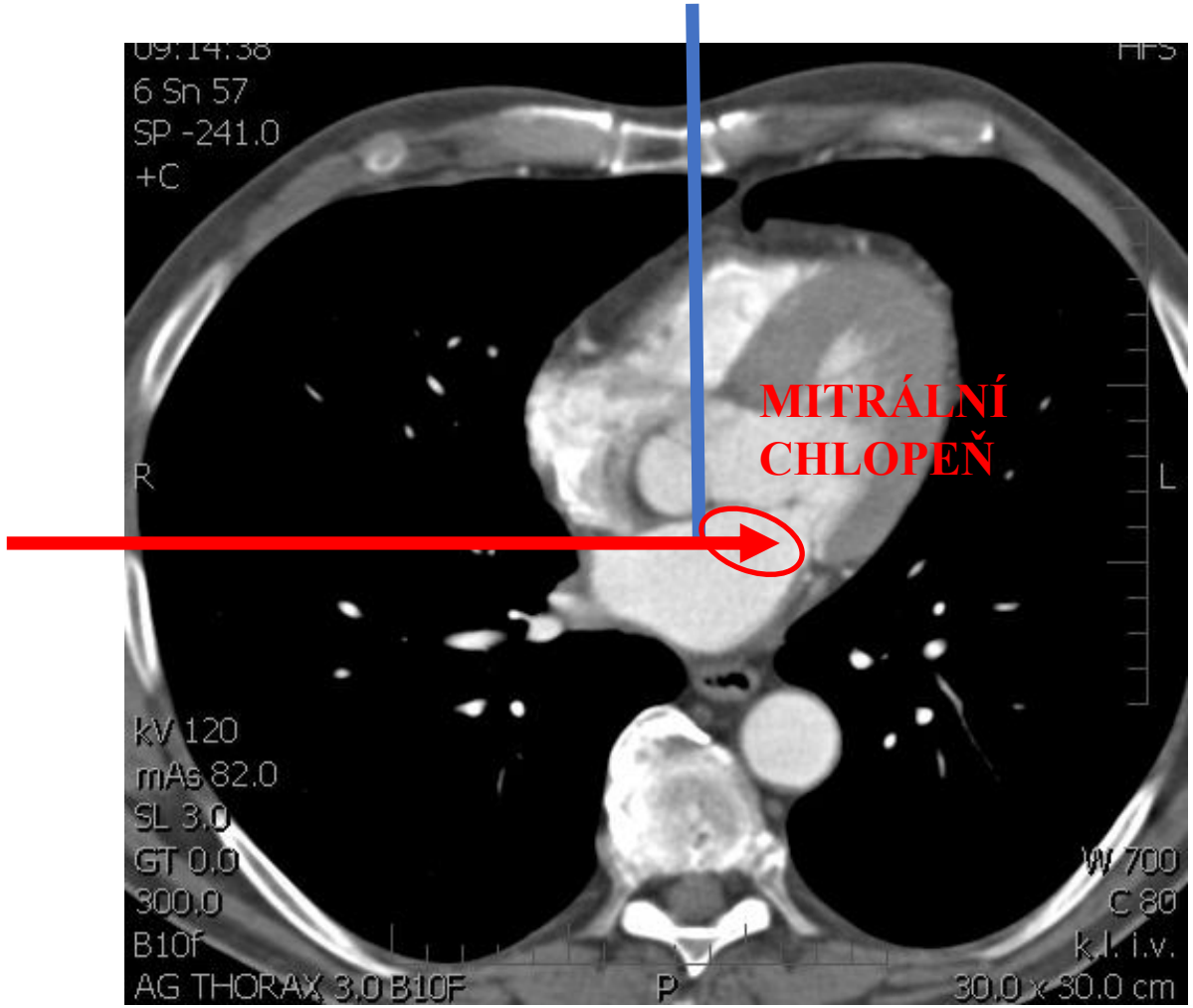
MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – CHIRURGICKÝ PŘÍSTUP



MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – CHIRURGICKÝ PŘÍSTUP



MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – KOSMETICKÝ EFEKT

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – DLOUHODOBÉ VÝSLEDKY

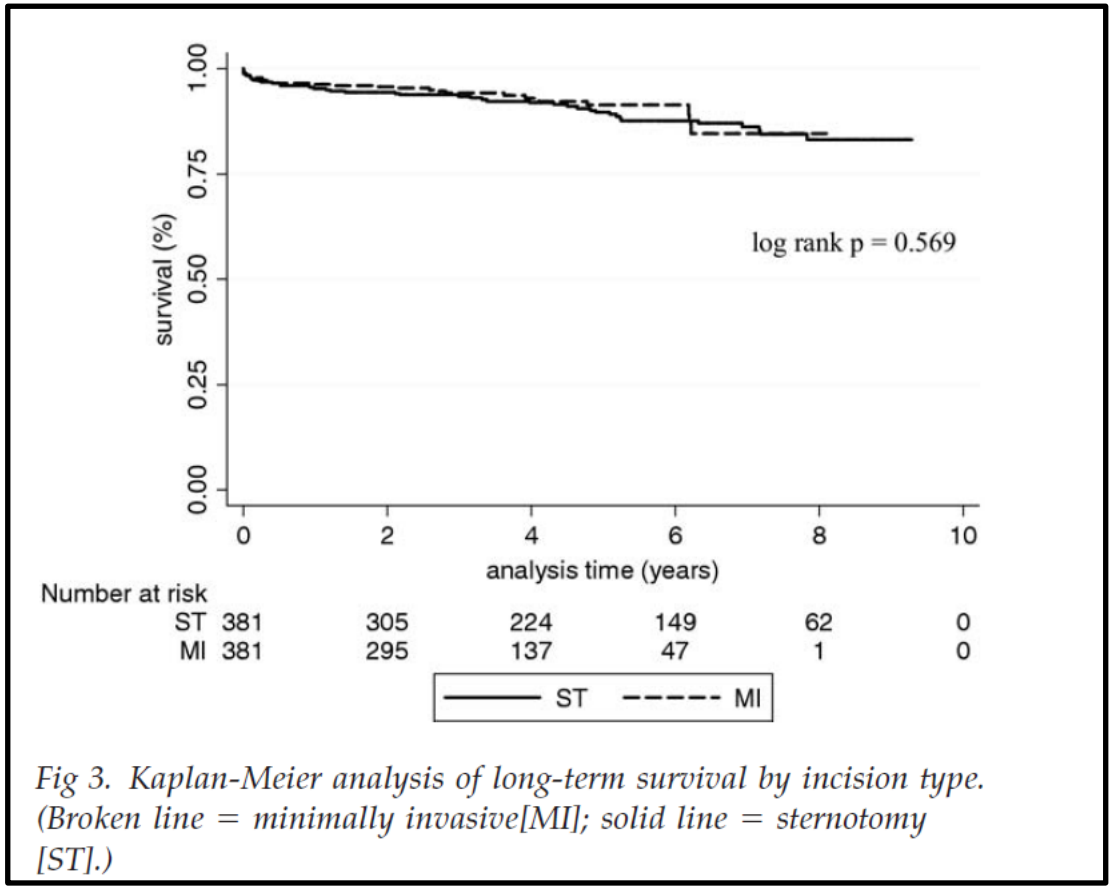
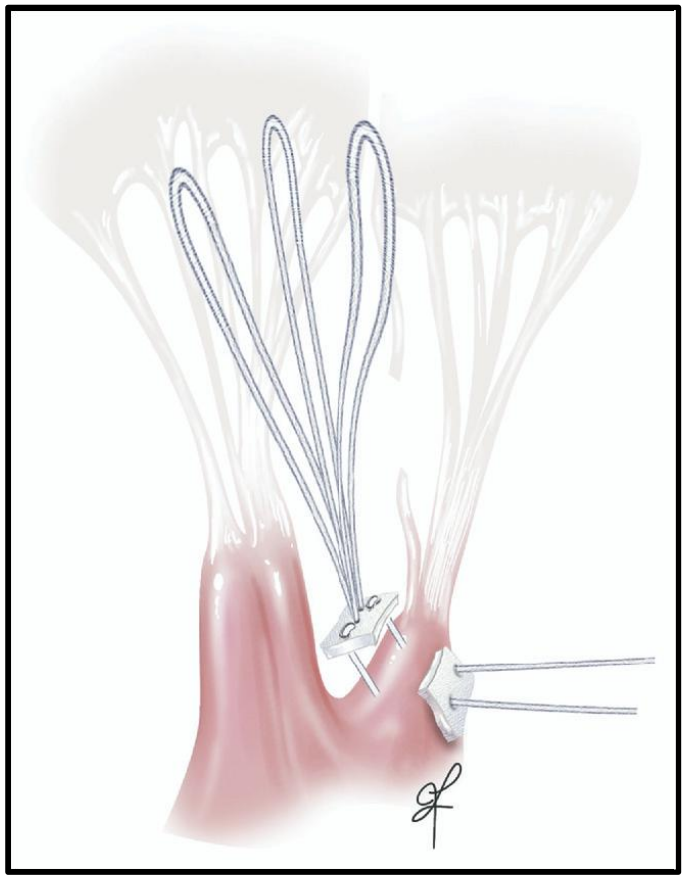


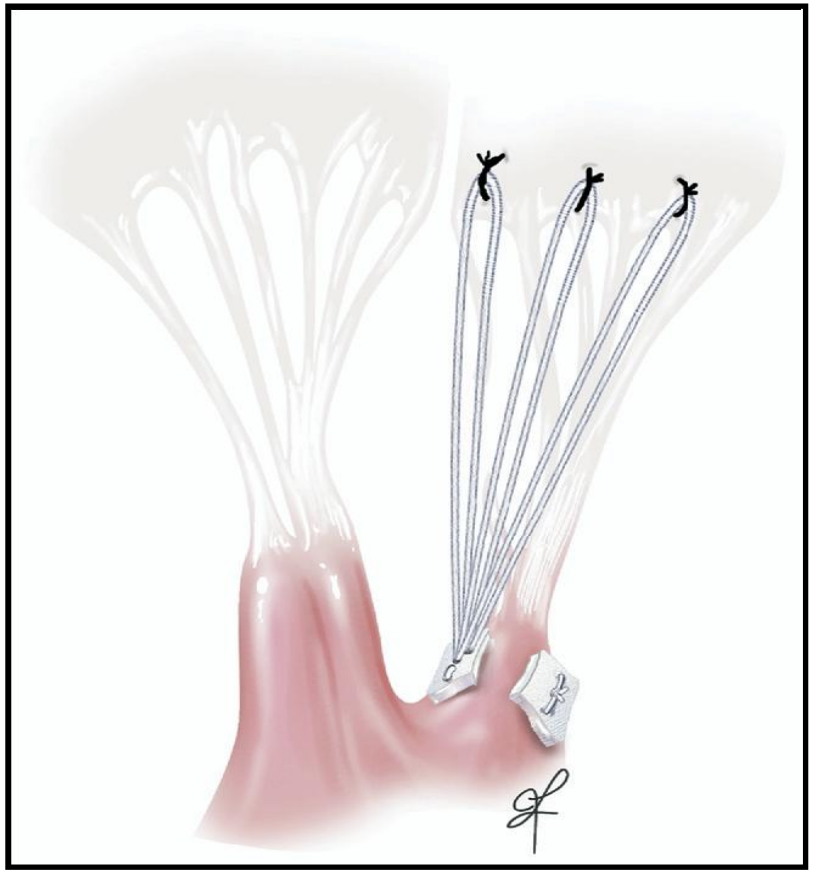
Fig 3. Kaplan-Meier analysis of long-term survival by incision type. (Broken line = minimally invasive[MI]; solid line = sternotomy [ST].)

Irbarne A et al: *Ann Thorac Surg 2010;90*:1471-8

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – CHIRURGICKÁ TECHNIKA

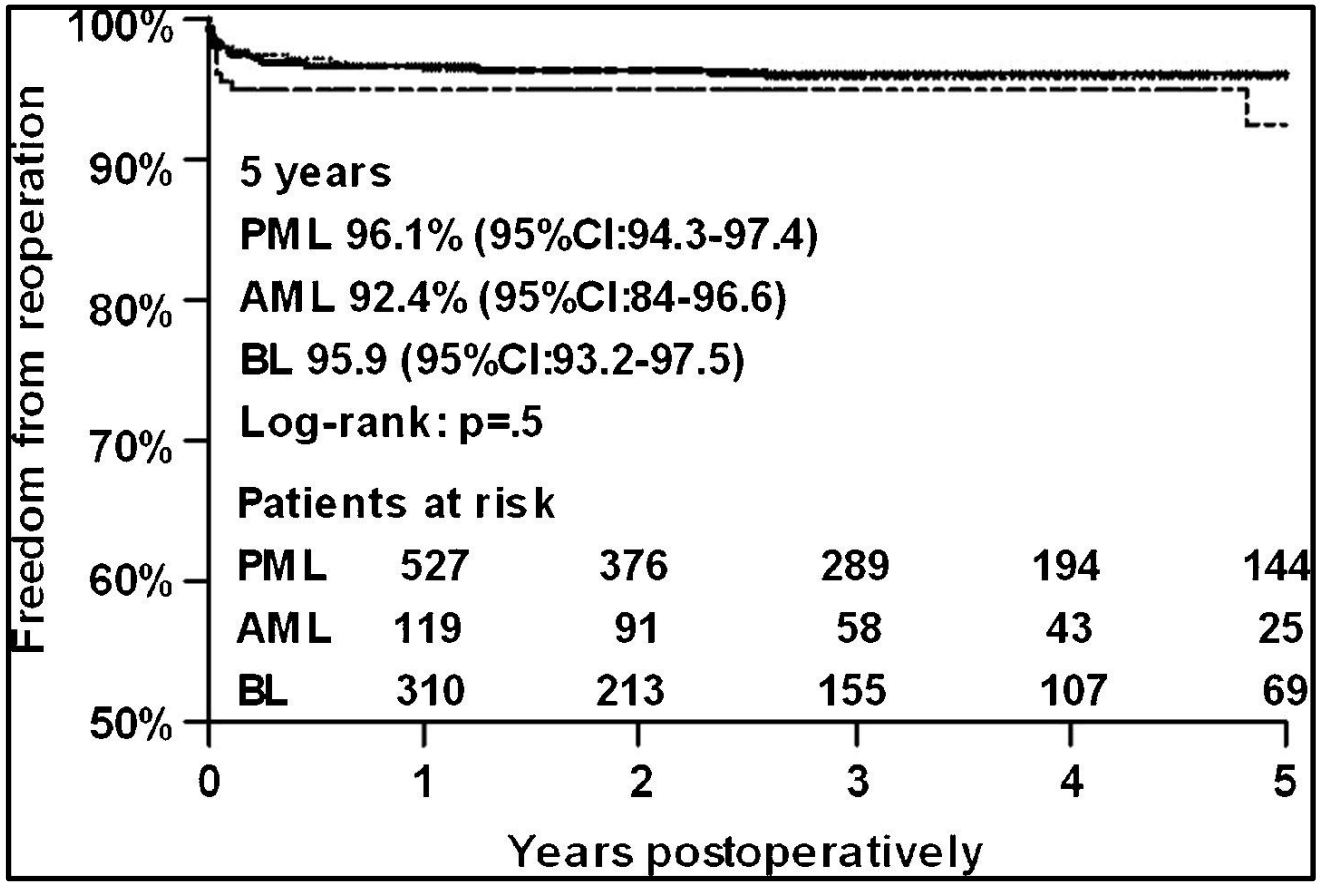




Seeburger J et al: *Semin Thorac Cardiovasc Surg 2007;19*:111-115

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH – CHIRURGICKÁ TECHNIKA



Seeburger J et al: *Eur J Cardiothor Surg 2009;36*:532-538

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH

CONSENSUS STATEMENT

Minimally Invasive Versus Open Mitral Valve Surgery

A Consensus Statement of the International Society of Minimally Invasive Coronary Surgery (ISMICS) 2010

Volkmar Falk, MD, Davy C. H. Cheng, MD,† Janet Martin, PharmD, MSc (HTA&M),†‡ Anno Diegeler, MD,§ Thierry A. Folliguet, MD,‖ L. Wiley Nifong, MD,¶ Patrick Perier, MD,§ Ehud Raanani, MD,# J. Michael Smith, MD,** and Joerg Seeburger, MD††*

Falk V et al: *Innovations 2011;6*:66-76

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

VÝHODY PRO PACIENTA

- Kosmetický efekt
- Nižší rané komplikace
- Menší spotřeba krevních derivátů
- Nižší výskyt FiS
- Kratší doba UPV
- Kratší doba pobytu na JIP
- Kratší doba hospitalizace

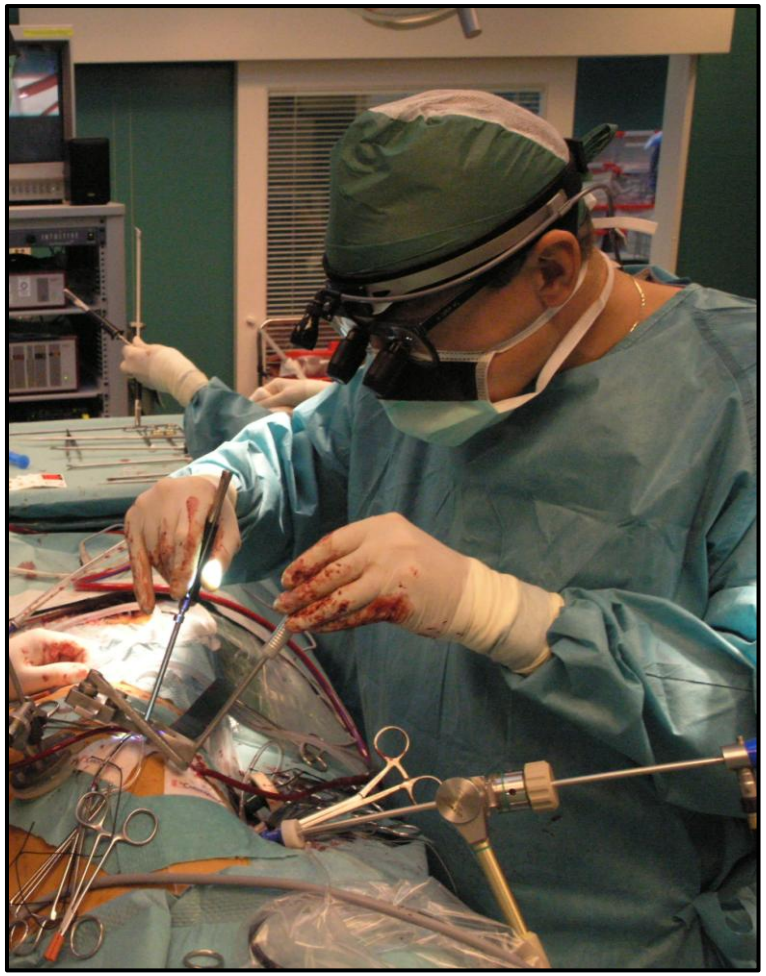
POTENCIÁLNÍ NEVÝHODY PRO PACIENTA

- Vyšší riziko CMP
- Vyšší riziko aortální disekce
- Vyšší riziko parézy N. phrenicus
- Riziko infekce třísla a lymfokély
- Delší doba svorky a mimotělního oběhu

Falk V et al: *Innovations 2011;6*:66-76

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ VIDEO-ASISTOVANÁ PLASTIKA MCH



„MICS transfers pain from the patient to the surgeon.“

H. Vanermen

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ROBOTIKA

=

TELEMANIPULACE

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

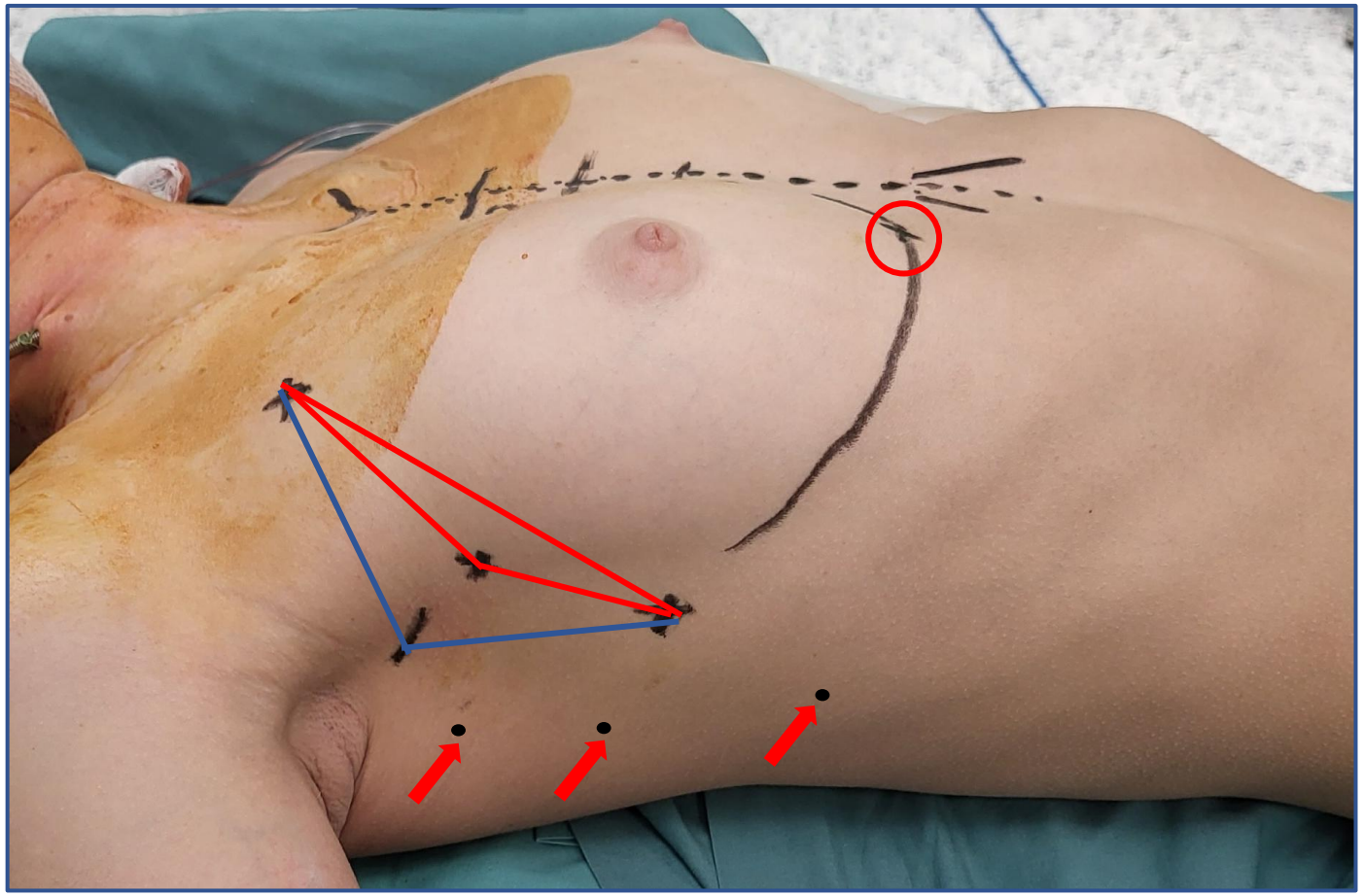
ROBOTIKA

=

TELEMANIPULACE

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ROBOTICKY PROVEDENÁ PLASTIKA MCH – CHIRURGICKÁ TECHNIKA

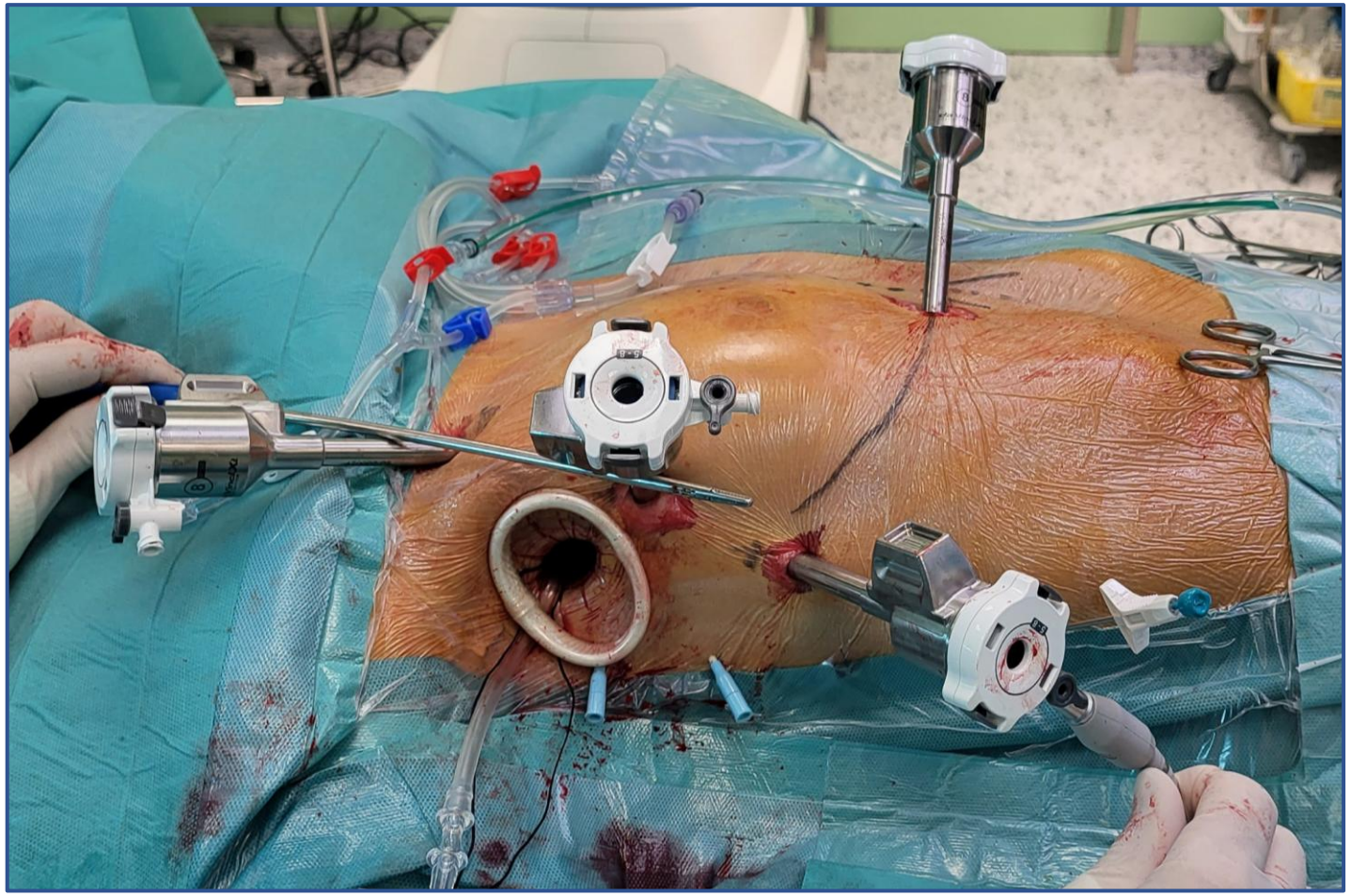


Rozmístění portů

- Čtyři 8mm trokary
- 2, 3 a 5 mezižebří pro robotické nástroje a kameru
- 4 (5-6) mezižebří pro dynamický LS rozvěrač
- 3 mezižebří pro asistentský port – 25 mm (1“)
- Perikardiální a bráničnítrakční stehy

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ROBOTICKY PROVEDENÁ PLASTIKA MCH – CHIRURGICKÁ TECHNIKA



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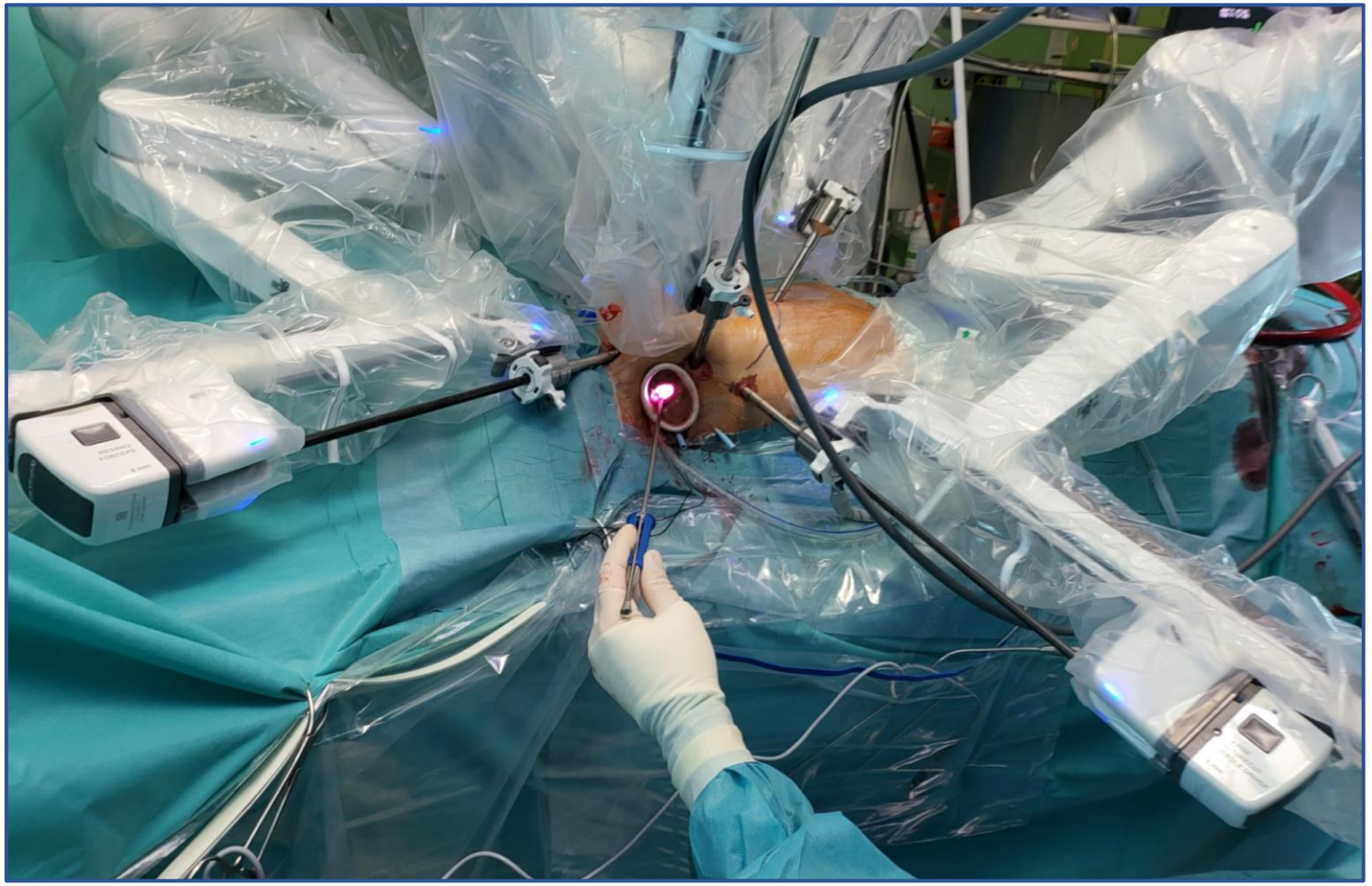
MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ROBOTICKY PROVEDENÁ PLASTIKA MCH – CHIRURGICKÁ TECHNIKA



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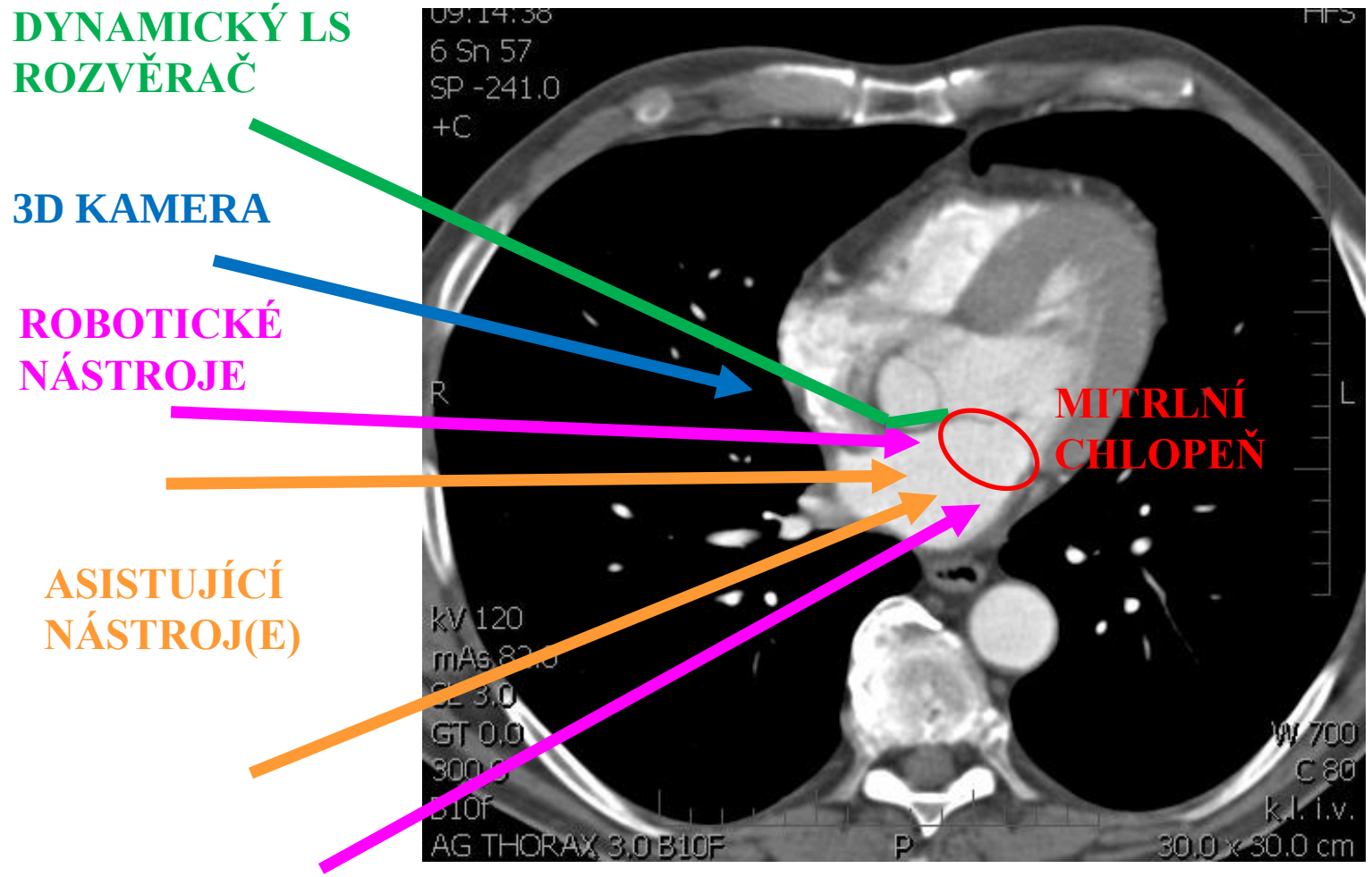
MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

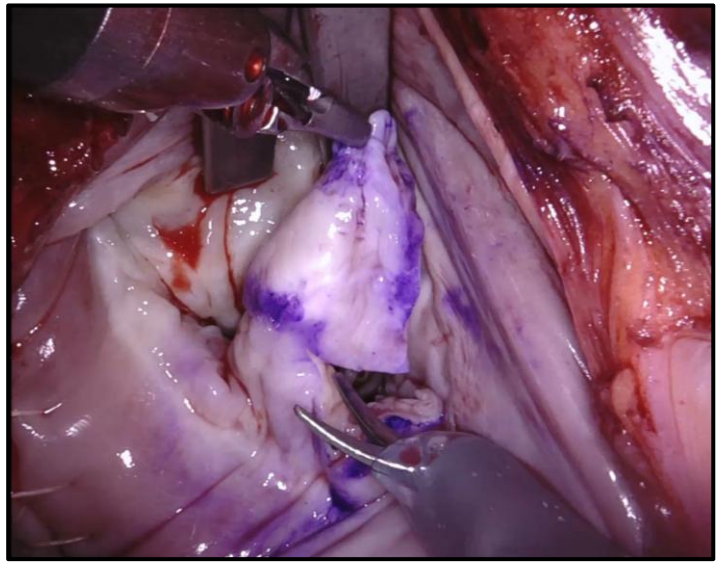
ROBOTICKY PROVEDENÁ PLASTIKA MCH – CHIRURGICKÁ TECHNIKA



Operační pole

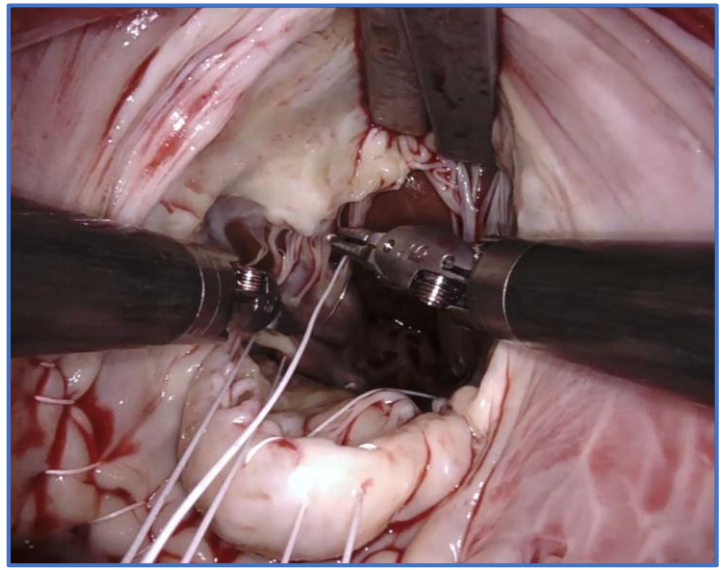
- 3D Kamera
- Dynamický LS rozvěrač
- Dvě robotická ramena – dva instrumenty
- 1-2 asistující nástroje

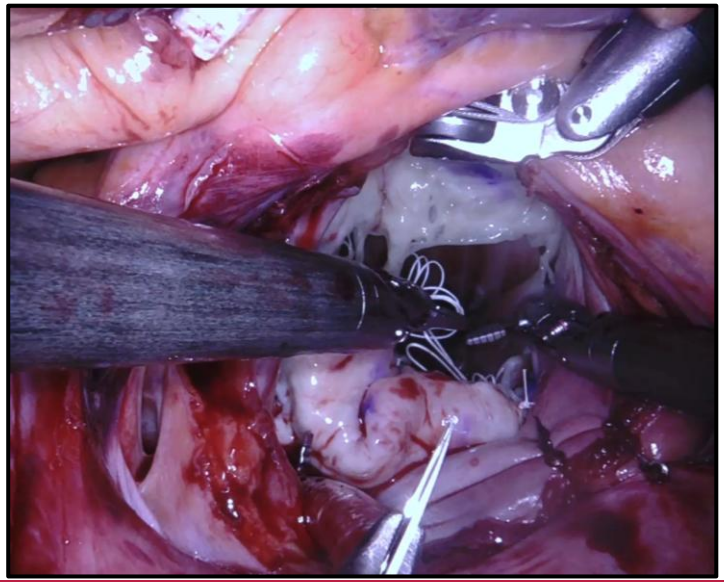
MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI



Triangulární resekce

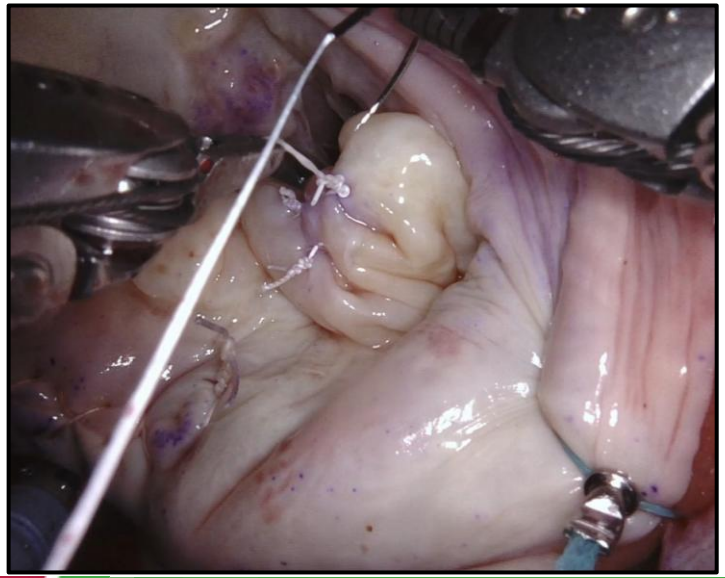
Arteficialní Gore-Tex chordy “David“



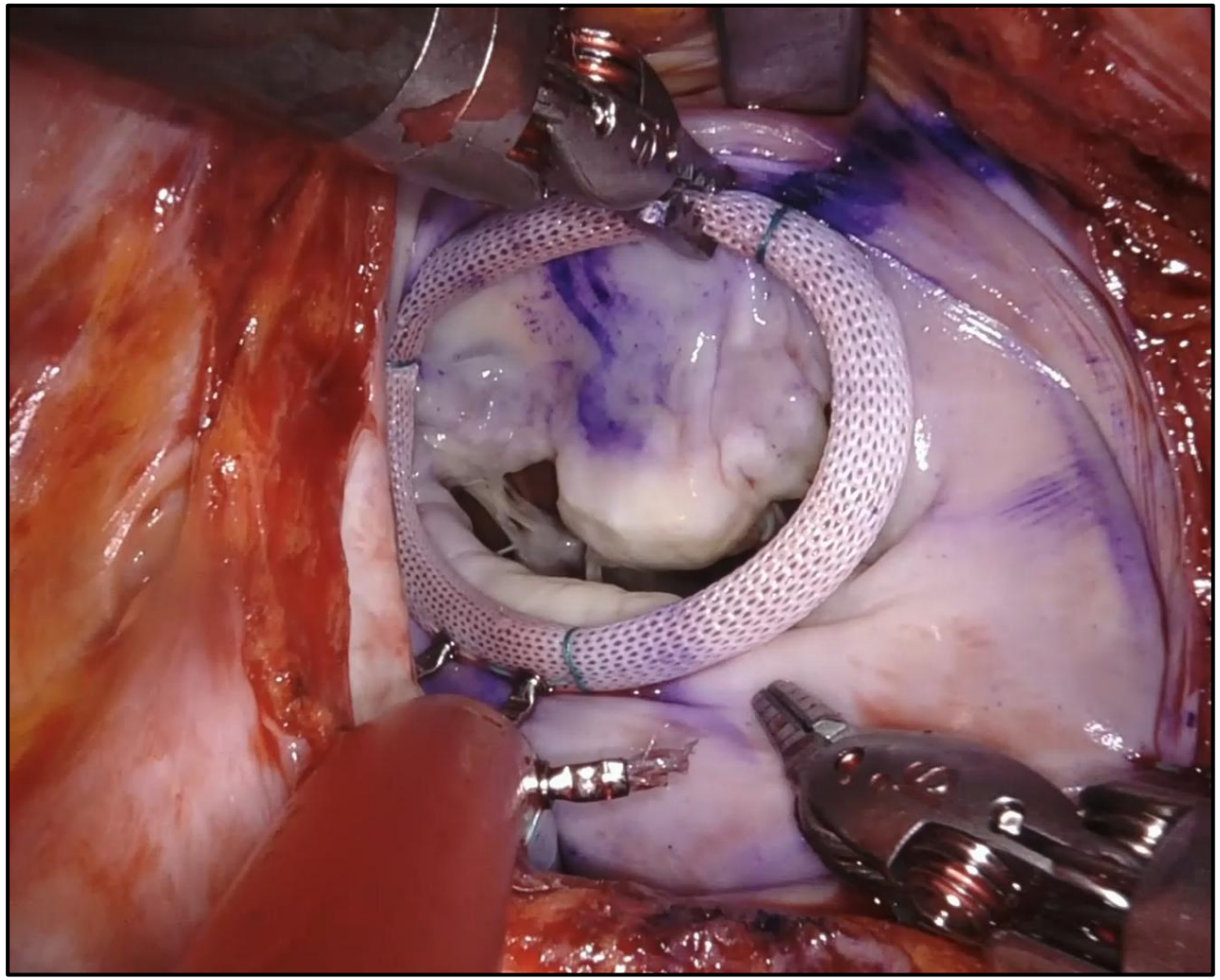


Arteficialní Gore-Tex chordy „Mohr“

Komplexní rekonstrukce



MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI



Implantace prstence

Není třeba kompromitovat techniku plastiky (bandy, pokračující stehy atd.)

Implantace plného semirigidního prstence (Carpentierovi principy remodelační anuloplastiky)

„Knot fasteners“ (CorKnot™) – jednotlivé stehy

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ROBOTICKY PROVEDENÁ PLASTIKA MCH – KOSMETICKÝ EFEKT

Operační rány

- Stav po 4 týdnech
- Minimální pooperační bolestiovost
- Stabilita hrudní stěny
- Plná fyzická aktivita obvykle po 2 týdnech

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

Early results of robotically assisted mitral valve surgery: Analysis of the first 1000 cases

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ABSTRACT

Objective: The study objective was to assess th
ment and clinical outcomes of robotic mitral val
1000 cases performed in a tertiary care center.

Methods: We reviewed the first 1000 patients (
going robotic primary mitral valve surgery, in
(n = 185), from January 2006 to November 2
was degenerative (n = 960, 96%), endocard
(n = 10, 1.0%), ischemic (n = 3, 0.3%), and
procedures were performed via right chest acces
diopulmonary bypass.

Results: Mitral valve repair was attempted in
ments and 1 resection of fibroelastoma), 992 (9
repair, and 5 (0.5%) of whom underwent valve
repair echocardiography showed that 99.7% o
992) left the operating room with no or mild mitr
echocardiography showed that mitral regurgit
97.9% of patients (915/935). There was 1 hospi
(1.4%) experienced a stroke; stroke risk decline
to 0.8% in the second 500 patients. Over the cou
ischemic and cardiopulmonary bypass times (*P*
and intensive care unit and postoperative length

Conclusions: Robotic mitral valve surgery is as
valve repair and low operative mortality and
algorithm-driven patient selection and increas
outcomes and procedural efficiency. (J Thorac

The Expanding Role of Endoscopic Robotics in Mitral Valve Surgery: 1,257 Consecutive Procedures

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Background. **The role of robotic instruments in mitral valve (MV) surgery continues to evolve. The purpose of this study was to assess the safety, efficacy, and scope of MV surgery using a lateral endoscopic approach with robotics (LEAR) technique.**

Methods. **From 2006 to 2013, a dedicated LEAR team performed 1,257 consecutive isolated MV procedures with or without tricuspid valve repair or atrial ablation. The procedures were performed robotically through five right-side chest ports with femoral artery or ascending aortic perfusion and balloon occlusion. Operative videos and data were recorded on all procedures and reviewed retrospectively.**

Results. **The mean age of all patients was 59.3 ± 20.5 years, and 8.4% (n = 105) had previous cardiac surgery. The MV repair was performed in 1,167 patients (93%). The MV replacement was performed in 88 patients (7%), and paravalvular leak repair in 2 patients. Concomitant atrial ablation was performed in 226 patients (18%), and**

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Can complex mitral valve repair be performed with robotics? An institution's experience utilizing a dedicated team approach in 500 patients†

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OBJECTIVES: The full potential of robotics has not been achieved in terms of addressing the most challenging mitral valve (MV) cases. We outline our technique and report our early results with totally endoscopic robotic MV repair in a wide range of pathologies.

METHODS: From May 2011 to August 2017, a dedicated team attempted totally endoscopic robotic MV repair in 500 MV regurgitation patients. Repair complexity was scored in 3 categories. We analysed our sequential case experience by quartiles.

RESULTS: Patient mean age was 60.8 years (range 18–88). Aetiologies included: degenerative 382 (76.4%), functional 37 (7.4%), inflammatory 22 (4.4%) and others 59 (11.8%). Mitral annular calcification was present in 64 (12.8%) cases. Simple MV repair (annuloplasty alone or with 1 leaflet segment repair) was performed in 240 (48%) patients, complex (repair involving more than 1 segment on the same leaflet) in

140 (28%) patients and most complex (bileaflet repair or mitral annular calcification excision with atrioventricular groove repair) in 120 (24%) patients. Concomitant procedures included: left appendage closure (94.8%), patent foramen ovale/atrial septal defect (PFO/ASD) closure (19.6%), cryoablation (19.4%), tricuspid repair (6.2%) or hybrid percutaneous coronary revascularization (7.8%). The overall repair rate was 99.4%, with 0.6% early mortality and 1.2% stroke rate (0.2% permanent neurological deficit). Case complexity increased with our experience. Despite an increase in aortic occlusion and perfusion times (median 86.5 and 125 min) and a slight decrease in operating room extubation rate (overall 64%), length of hospital stay (median 4 days) and 30-day readmission rate (overall 3.6%) were not affected by the progressive inclusion of more complex cases.

CONCLUSIONS: Totally endoscopic robotic MV repair performed by a dedicated team allows one to address the entire spectrum of pathological complexity and provides consistent results.

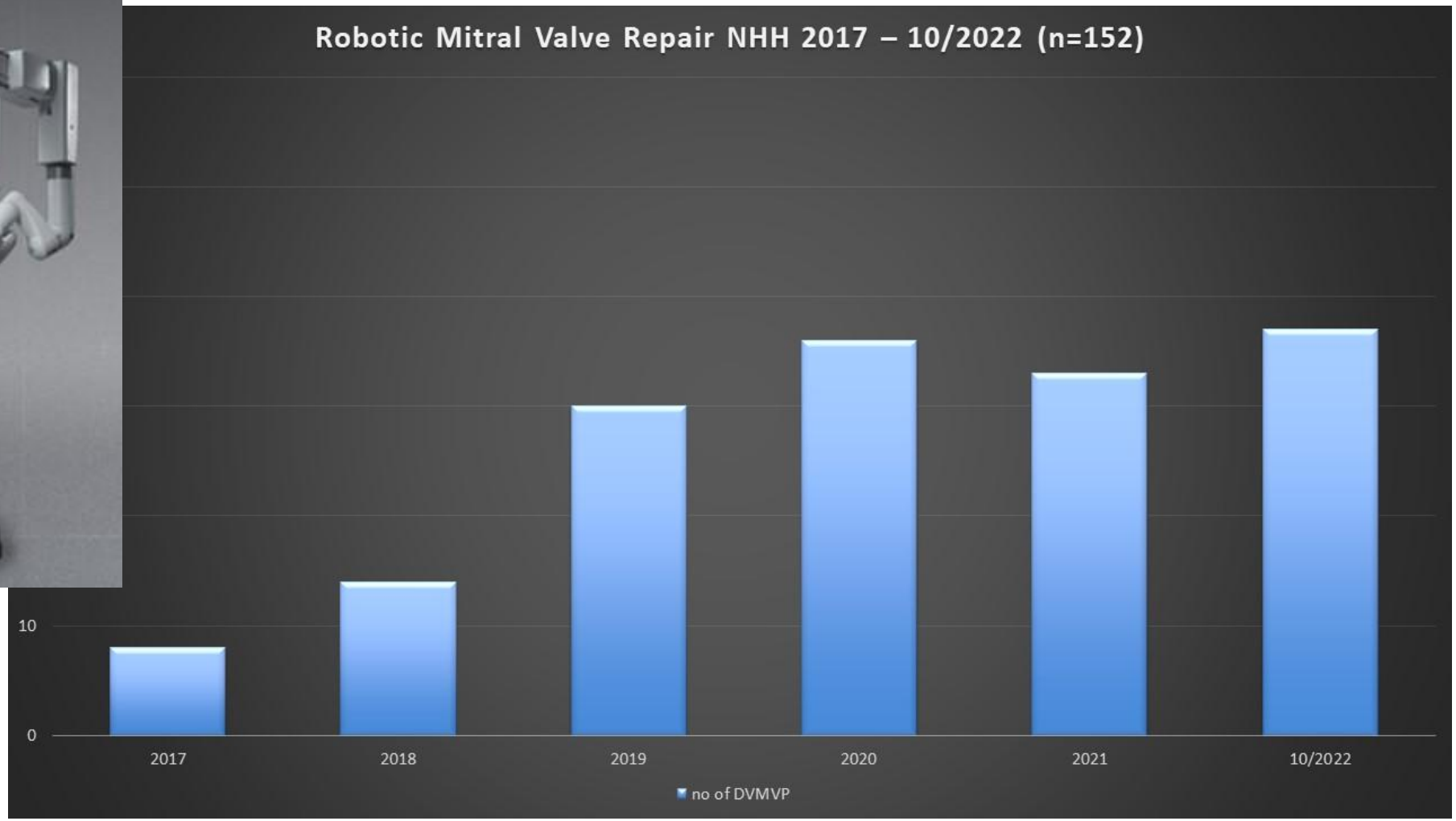
Keywords: Mitral valve • Robotics • Mitral repair • Mitral valve repair

Gillinov M et al: J Thorac Cardiovasc Surg 2018;155:82-91

Murphy DA et al: Ann Thorac Surg 2015;100:1675-82

Loulmet D et al: Eur J Cardiothor Surg 2019;56:470-8

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI



MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

Robotic MVRep Na Homolce Hospital 2017-2022 – Single Surgeon

Patients demografic data	
Number of patients (n)	113
Female sex (n)	35 (30,9 %)
Age (years)	50,9±13,8 (20 – 78)
Tricuspid regurgitation ≥ 3 gr (n)	6 (5,3 %)
Atrial fibrillation (n)	10 (8,9 %)
IHD (n)	0 (0 %)
NYHA (grade)	1,56±0,56 (1-3)

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

Robotic MVRep Na Homolce Hospital 2017-2022 – Single Surgeon

Preoperative TTE data	
LVEF (%)	66,1 ± 4,87 (55 -75)
LVEDD (mm)	56, 0± 7,09 (50 – 72)
LVESD (mm)	32,6 ± 7,19 (25 – 46)
MR grade (grade)	3,94 ± 0,25
ERO (cm^2)	0,53 ± 0,16
RV (ml)	83,17 ± 25,2
AP mitral annulus diameter MCH (mm)	40,0 ± 5,48

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

Robotic MVRep Na Homolce Hospital 2017-2022 – Single Surgeon

Perioperative data	
CPB time (min)	165,9±41,6
Cross-clamp time (min)	107,6±33,8
Endoclamp (n)	33 (29,2 %)
Transthoracic clamp (n)	80 (70,8 %)
Femoral cannulation (n)	111 (98,2 %)
Axillary cannulation (n)	2 (1,8 %)

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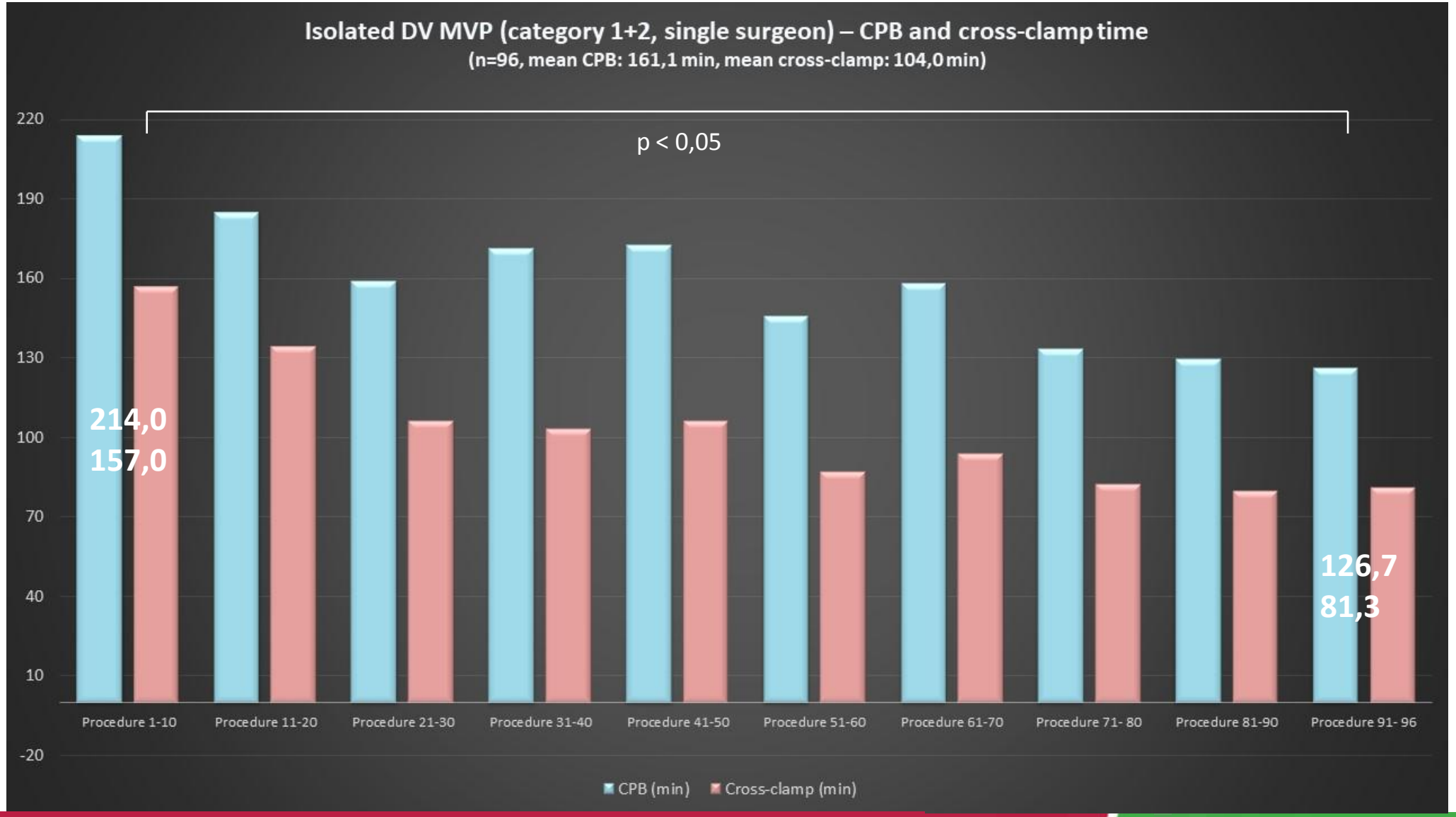

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

Robotic MVRep Na Homolce Hospital 2017-2022 – Single Surgeon

Surgical technique	
Valve repair (n)	113 (100 %)
Ring implantation (n)	113 (100 %)
Full semirigid ring (Physio II®) (n)	109 (96,5 %)
Ring size (size)	35,1± 3,6 (28-40)
• Isolated ring (n)	23 (20,4%)
• Triangular resection (n)	38 (33,6 %)
• Neochords (n)	42 (37,2 %)
• Chordal transfer (n)	5 (4,4 %)
• Other (n)	19 (16,8 %)
TV repair	6 (5,3 %)
MAZE - cryo (n)	10 (8,9 %)

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Robotic MVRep Na Homolce Hospital 2017-2022 – Single Surgeon

Early results		
Conversion – limited thoracotomy (n)	1	(0,9 %)
Conversion – sternotomy (n)	0	(0,0 %)
Early mitral valve reintervention (n)	0	(0,0 %)
Reexploration for bleeding (n)	2	(1,8 %)
Prolonged arteficial ventilation (n)	2	(1,8 %)
Postoperative severe LCO (n)	1	(0,9 %)
Lymphocele (n)	6	(5,3 %)
Stroke (n)	0	(0 %)
Mortality (30d) (n)	0	(0 %)

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Robotic MVRep Na Homolce Hospital 2017-2022 – Single Surgeon

Long term results	
Follow-up (months)	42,9 ± 9,3 (1-65)
MR grade at the latest TTE (grade)	0,45 ± 0,26 (0-2)
Late mortality (n)	0 (0%)
Late mitral valve reintervention (n)	0 (0%)

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ A ROBOTICKÁ CHIRURGIE MCH - RECENTNÍ EVIDENCE

Grant SWF et al: Heart 2019;105:783-789
Eqbal AJ et al: J Card Surg 2022;37:1319-1327
Hassanbad AF et al: Innovations 2022;17:471-481
Williams ML et al: Ann Cardiothor Surg 2022;11:490-503
Williams ML et al: Ann Cardiothor Surg 2022;11:553-563

Propensity-matched analysis of minimally invasive approach versus sternotomy for mitral valve surgery

Stua
Josep

Minimally invasive mitral valve surgery versus conventional sternotomy mitral valve surgery: A systematic review and meta-analysis of 119 studies

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Ameen Basha MD
Fan Victor Chu MD
Richard P. Whitloc

A Systematic Review and Meta-Analysis of Robot-Assisted Mitral Valve Repair

Innovations
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Tania Stafinski

Robotic versus conventional sternotomy mitral valve surgery: a systematic review and meta-analysis

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Systematic review and meta-analysis of mid-term survival, reoperation, and recurrent mitral regurgitation for robotic-assisted mitral valve repair

Michael L. Williams[1,2,3], Aditya Eranki[4], Andrew Mamo[5], Ashley Wilson-Smith[2,6], Bridget Hwang[2], Ramanen Sugunesegran[1], Tristan Yan[2,7], Emiliano Navarra[8], T. Sloane Guy[9], Johannes Bonatti[10]

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

MINI-INVAZIVNÍ A ROBOTICKÁ CHIRURGIE MCH - RECENTNÍ EVIDENCE

- Mortalita, celkové komplikace a chirurgické výsledky plastiky srovnatelné s otevřenou technikou
- Poněkud delší časy mimotělního oběhu a svorky
- Nižší počet raných komplikací
- Nižší výskyt pooperační fibrilace síní
- Menší potřeba transfuzí
- Kratší doba umělé plicní ventilace
- Kratší pobyt na JIP
- Kratší celková doba hospitalizace
- Robotická technika umožňuje rutinní použití komplexních technik
- Jedna metaanalýza (Williams) – nižší mortalita u robotické techniky
- NENÍ VYŠŠÍ VÝSKYT CMP, DISEKCE A PARÉZY N. PHRENICUS

Grant SWF et al: Heart 2019;105:783-789
Eqbal AJ et al: J Card Surg 2022;37:1319-1327
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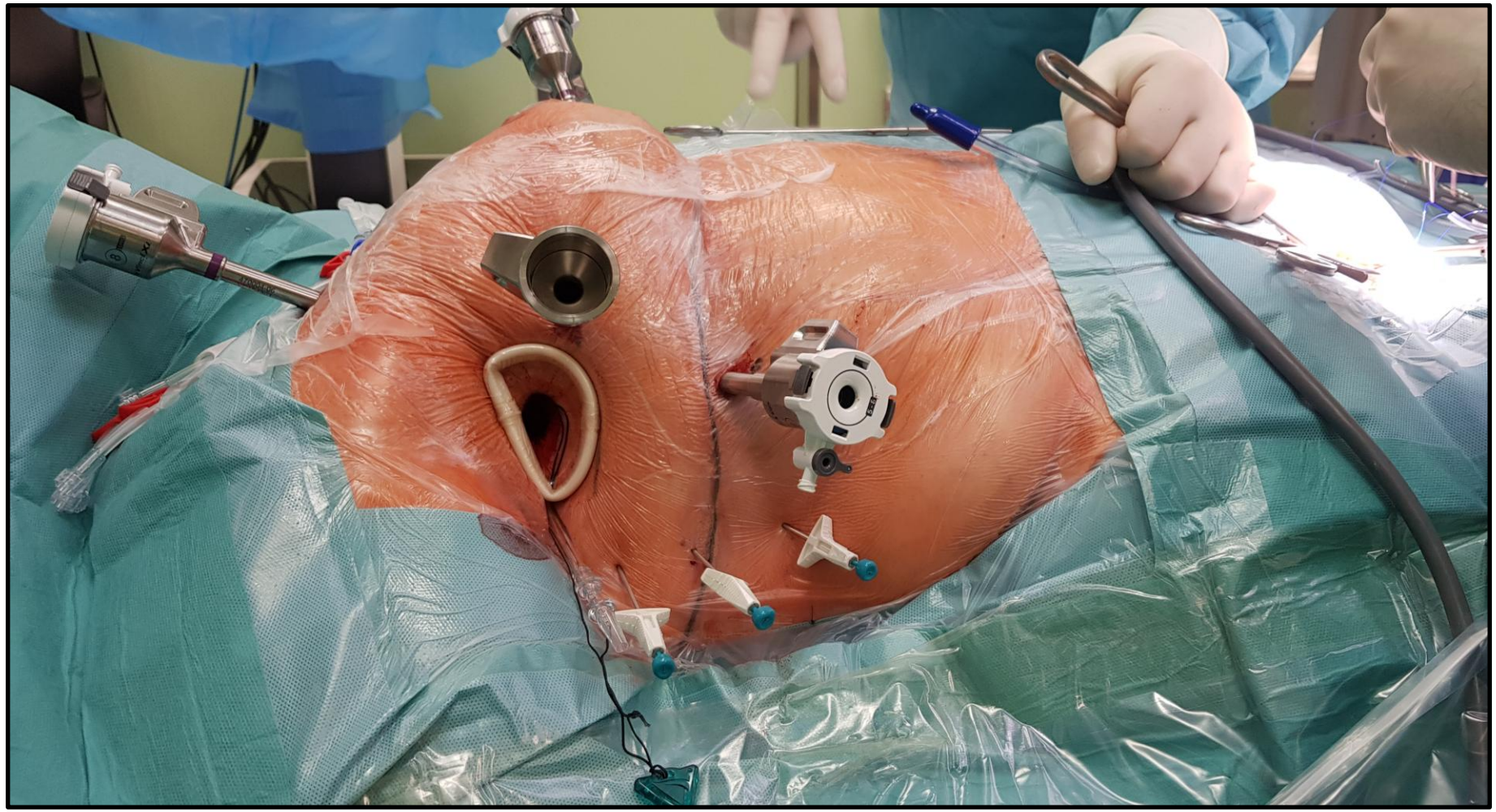
MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

SELEKCE PACIENTŮ – RELATIVNÍ KONTRAINDIKACE – JIŽ NEJDE O KOSMETIKU!!!

MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

SELEKCE PACIENTŮ – RELATIVNÍ KONTRAINDIKACE – JIŽ NEJDE O KOSMETIKU!!!



MINI-INVAZIVNÍ VÝKONY NA MITRÁLNÍ CHLOPNI

ZÁVĚRY

- **Indikace k záchovným operacím mitrálních chlopní se posouvají čím dál tím více k asymptomatickým pacientům bez dilatace LK**
- **Mini-invazivní video-asistovaná a robotická chirurgie mitrální chlopně jsou standardizované chirurgické metody s reprodukovatelnými a predikovatelnými výsledky**
- **Pokroky především v zobrazovací a robotické technologii, ale i pokroky v operační technice, umožňují rozšířit spektrum prováděných minimálně invazivních výkonů na mitrální chlopni**
- **Krátko i dlouhodobé výsledky jsou srovnatelné s výsledky záchovných operací mitrální chlopně ze střední sternotomie s neporovnatelně lepším kosmetickým efektem a větší akceptací pacienty**
- **Obě metody mají potenciál stát se standardem léčby primární mitrální regurgitace**

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Děkuji za pozornost!!!