PLICNÍ EMBOLIE A IKTUS – MOŽNOST NEBO REALITA?

Martin Mates

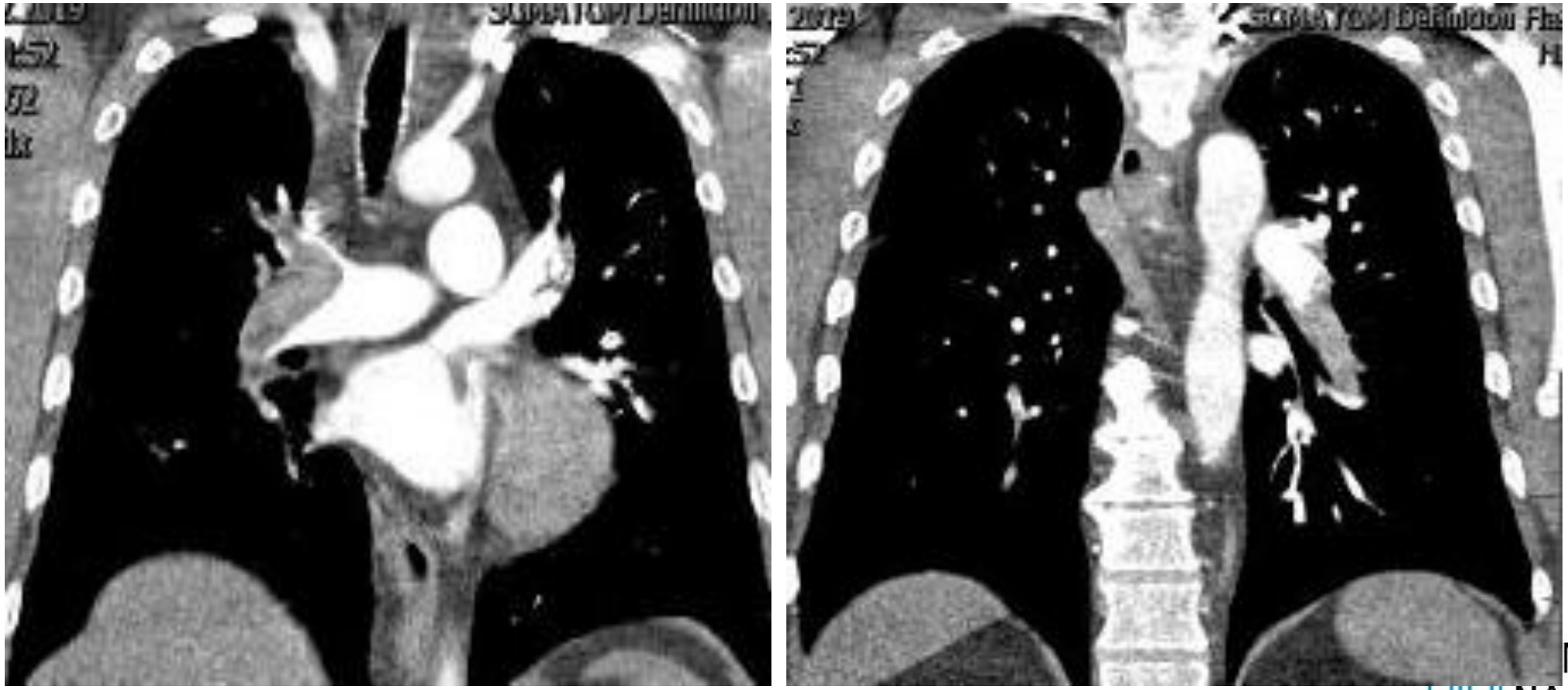
Nemocnice Na Homolce

PLICNÍ EMBOLIE A IKTUS – MOŽNOST NEBO REALITA?

Martin Mates

Nemocnice Na Homolce

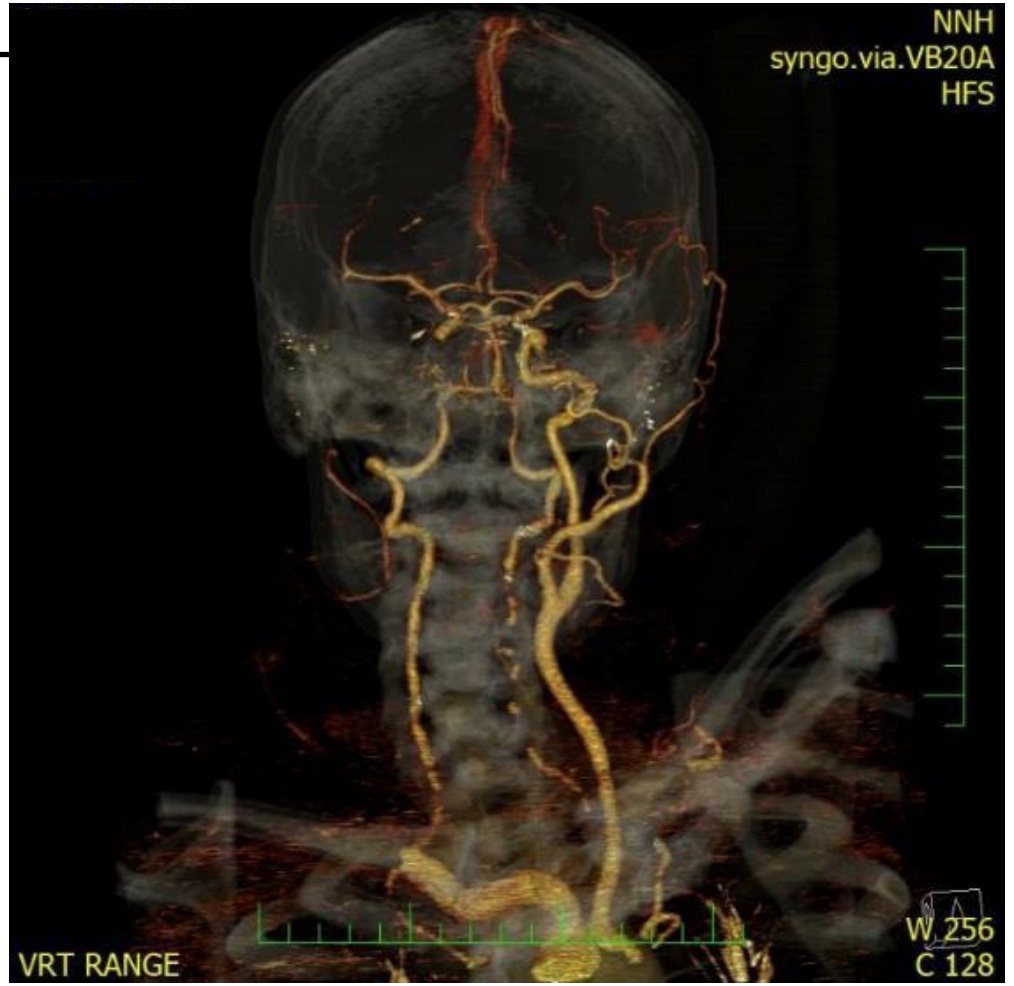
- Náhle vzniklá klidová dušnost, bolest na hrudi, hypertenze, bolesti v pravé horní končetině
- Před 3 týdny úraz pravého kolene (bandáž, berle)



- Chirurgická embolektomie z a.brachialis

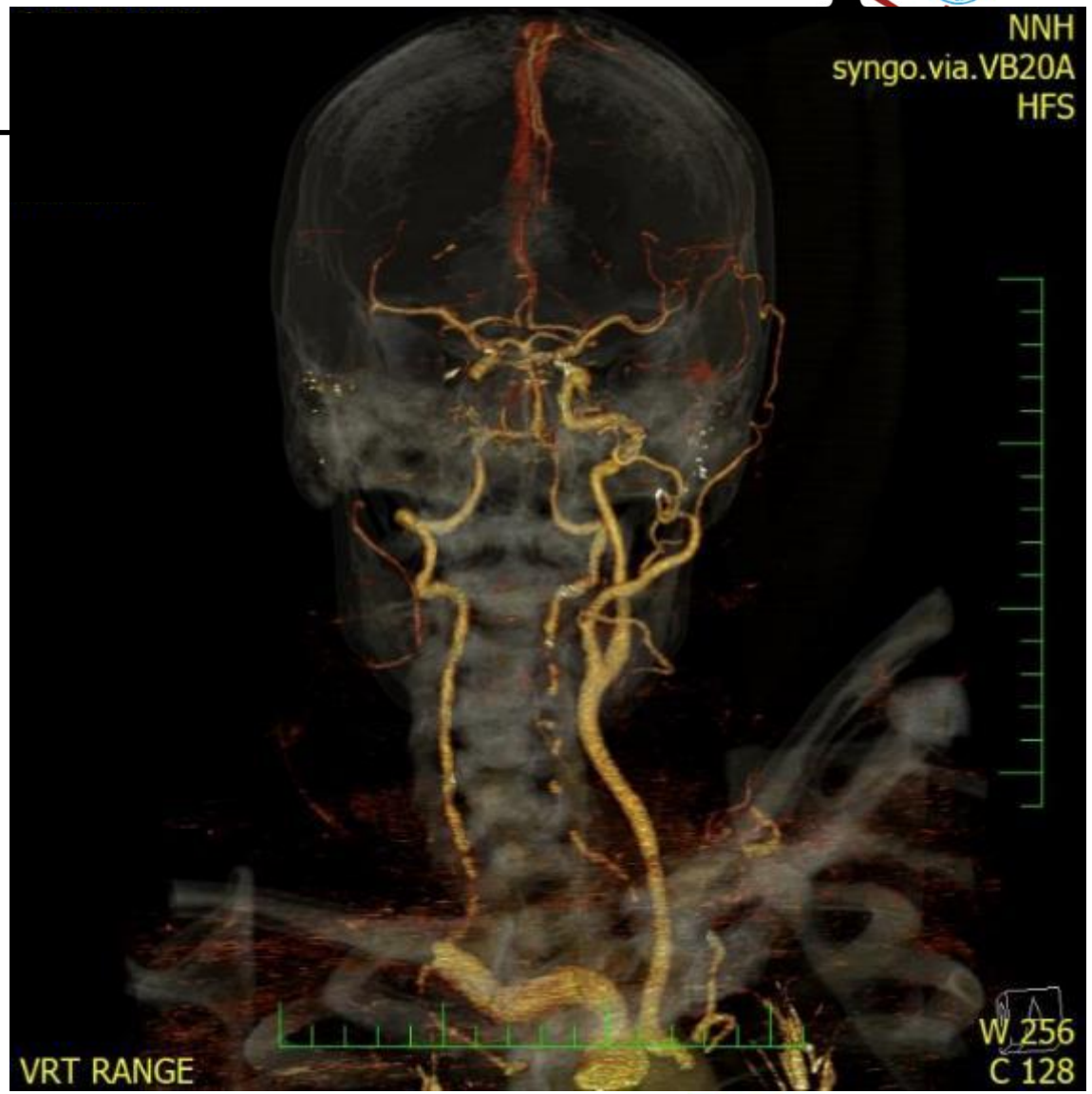
- Plicní embolie s vyšší středním rizikem – LMWH
- TEE – bez průkazu intrakardiální trombózy, potvrzeno PFO s bidirekčním zkratem, masivní PL zkrat při bubble testu --> katetrizační uzávěr PFO

- 2 hodiny po nekomplikovaném uzávěru PFO levostranná hemiplegie
  - Kompletní uzávěr ACC dx a ACI dx
  - Relativní hypoperfuze pravé hemisféry (povodí ACM dx)



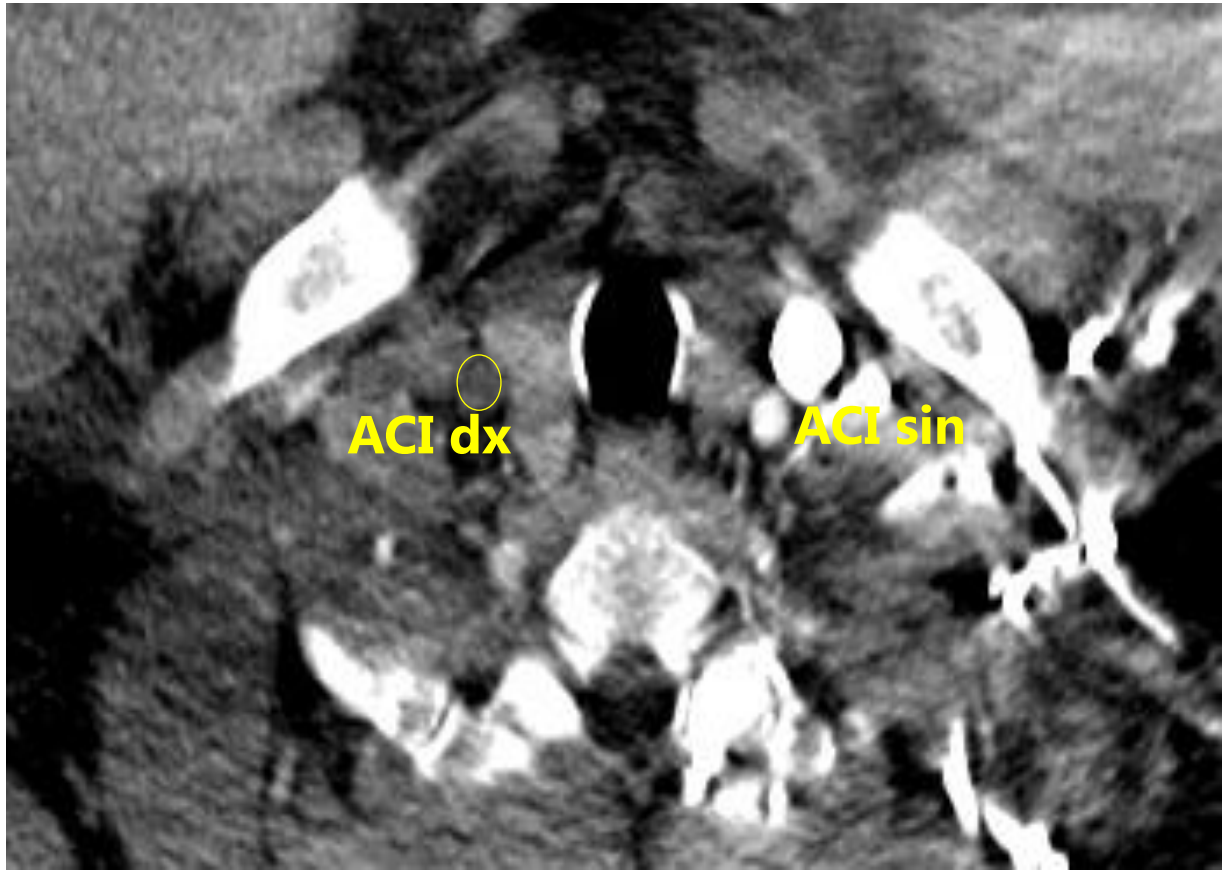
- 2 hodiny po nekomplikovaném uzávěru PFO levostranná hemiplegie
  - Kompletní uzávěr ACC dx a ACI dx
  - Relativní hypoperfuze pravé hemisféry (povodí ACM dx)

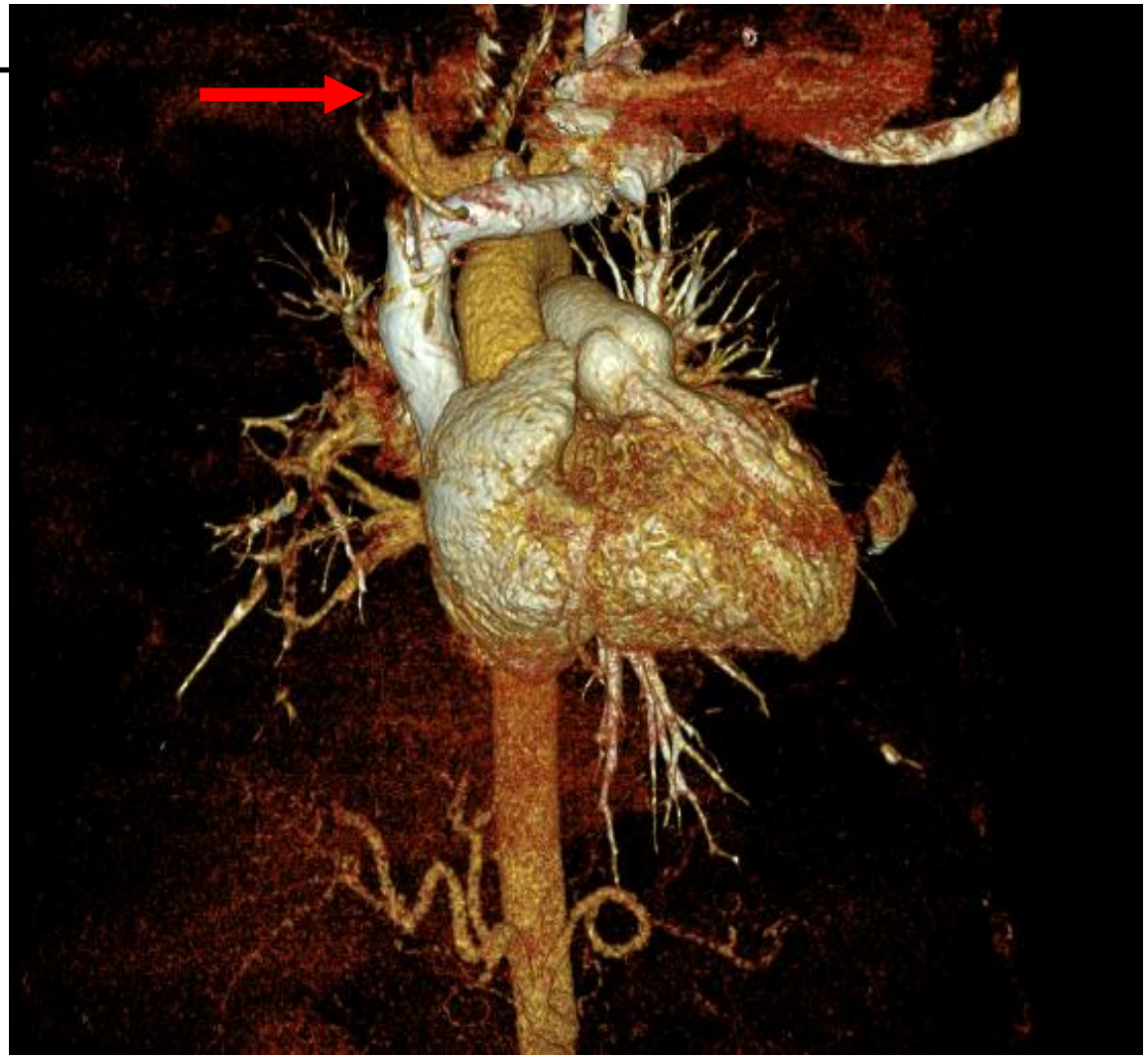
- Provedena úspěšná neurointervence



NEMOCNICE NA HOMOLCE

Retrospektivní vyhodnocení vstupního CT





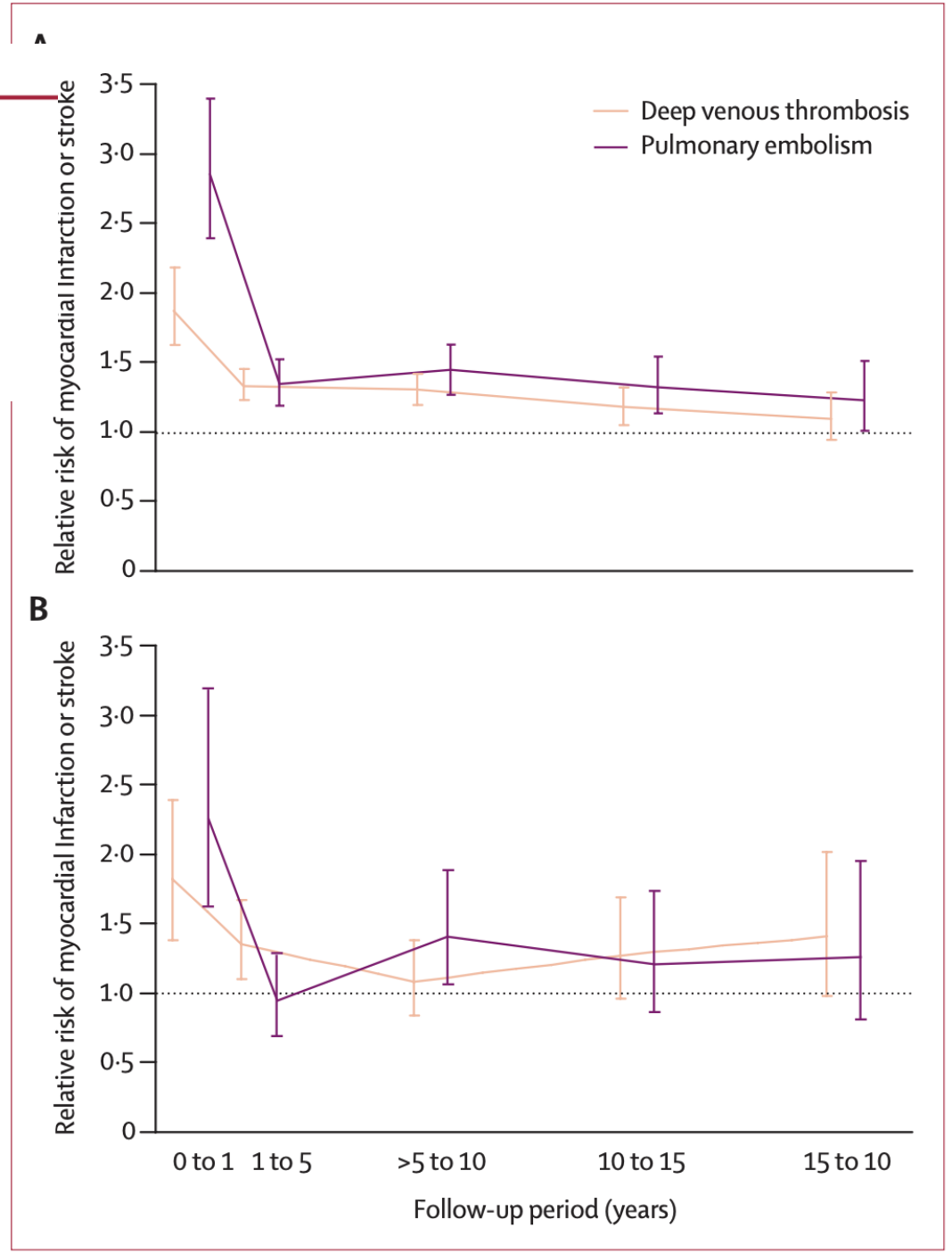
Venous thromboembolism and subsequent hospitalisation due to acute arterial cardiovascular events: a 20-year cohort study

Henrik Toft Sørensen, Erzsebet Horvath-Puho, Lars Pedersen, John A Baron, Paolo Prandoni

***Lancet* 2007; 370: 1773–79**

DÁNSKÁ NÁRODNÍ DATABÁZE, sledování 20 let

	Počet pac.	Relativní riziko CMP
Hluboká žilní trombóza	25 192	2,19
Plicní embolie	16 925	2,93
Kontrolní skupina	163 566	



Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2023; 167:XX.

High incidence of acute and subacute ischaemic foci on brain MRI in patients with a diagnosis of acute pulmonary embolism and confirmed patent foramen ovale

Radomir Nykl[a], Martin Hutyra[a], Eva Cechakova[b], Jan Precek[a], David Vindis[a], David Richter[a], Milos Taborsky[a]

- 129 pacientů s CT prokázanou PE
- PFO prevalence 36,4%
- 7 pacientů (5,4%) mělo asymptomatické akutní/subakutní ischemická ložiska MR mozku → z nich 6 pacientů mělo průkaz PFO.

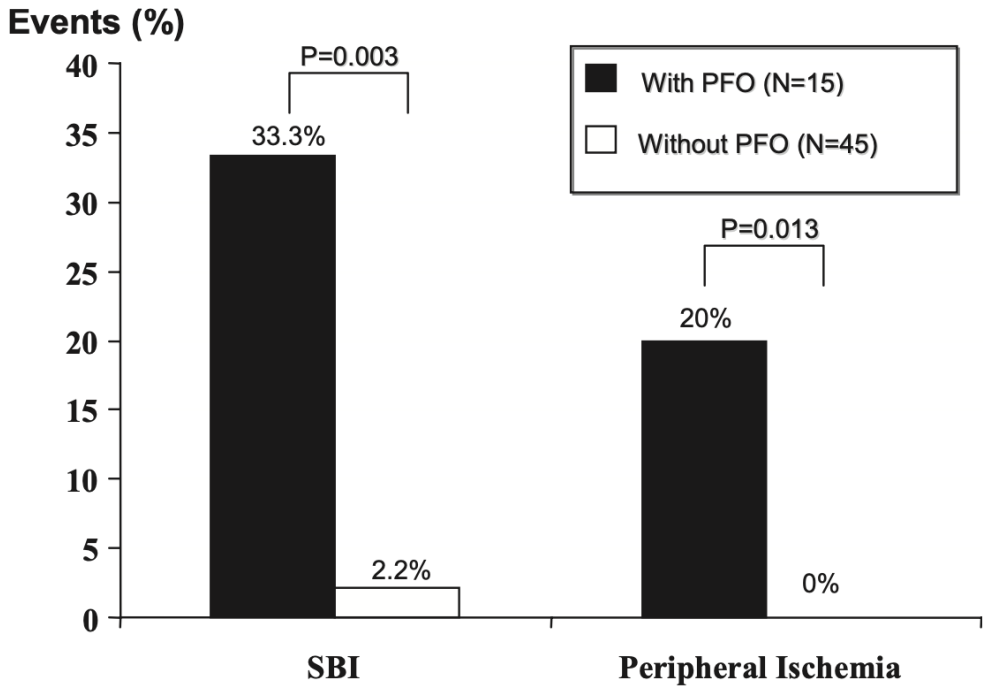
Nykl R et al. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2023; 167

Silent Cerebral Infarcts in Patients With Pulmonary Embolism and a Patent Foramen Ovale

A Prospective Diffusion-Weighted MRI Study

Marie-Rose Clergeau, MD; Michèle Hamon, MD; Rémy Morello, MD; Eric Saloux, MD; Fausto Viader, MD; Martial Hamon, MD, FESC

- 60 pacientů s CT prokázanou PE, 1 pacient se symptomatickou CMP
- PFO prevalence 25%



Silent brain infarct

Stroke. 2009;40:3758-3762.)

Patent Foramen Ovale Is an Important Predictor of Adverse Outcome in Patients With Major Pulmonary Embolism

Stavros Konstantinides, MD; Annette Geibel, MD; Wolfgang Kasper, MD; Manfred Olschewski, MD; Liane Blümel, MD; Hanjörg Just, MD

- 139 pacientů s CT prokázanou plicní embolii
- 1 pacient se symptomatickou CMP
- PFO prevalence 33%

TABLE 3. In-Hospital Clinical Events

Event	Patients With Patent Foramen Ovale (n=48), n (%)	Patients Without Patent Foramen Ovale (n=91), n (%)	*P*
Ischemic stroke	6 (13)	2 (2.2)	.02
Peripheral arterial embolism	7 (15)	0	<.001
Cerebral bleeding	2 (4.2)	1 (1.1)	.27
Other major bleeding	8 (17)	19 (21)	.66
Endotracheal intubation	17 (35)	15 (16)	.02
Cardiopulmonary resuscitation	9 (19)	10 (11)	.3
Death	16 (33)	13 (14)	.015

Circulation. 1998;97:1946-1951.)

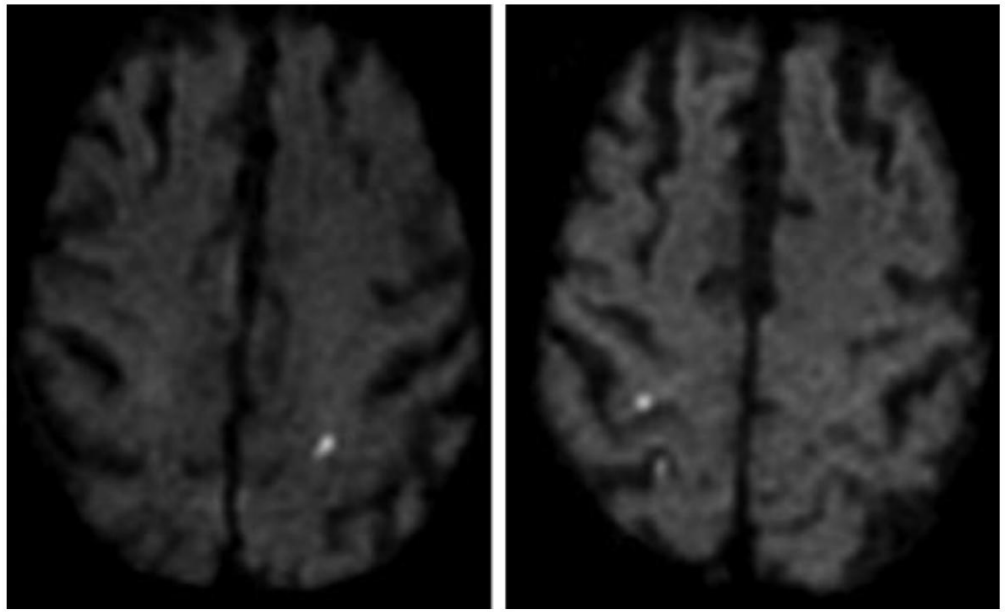
EuroIntervention 2018;14-onlin

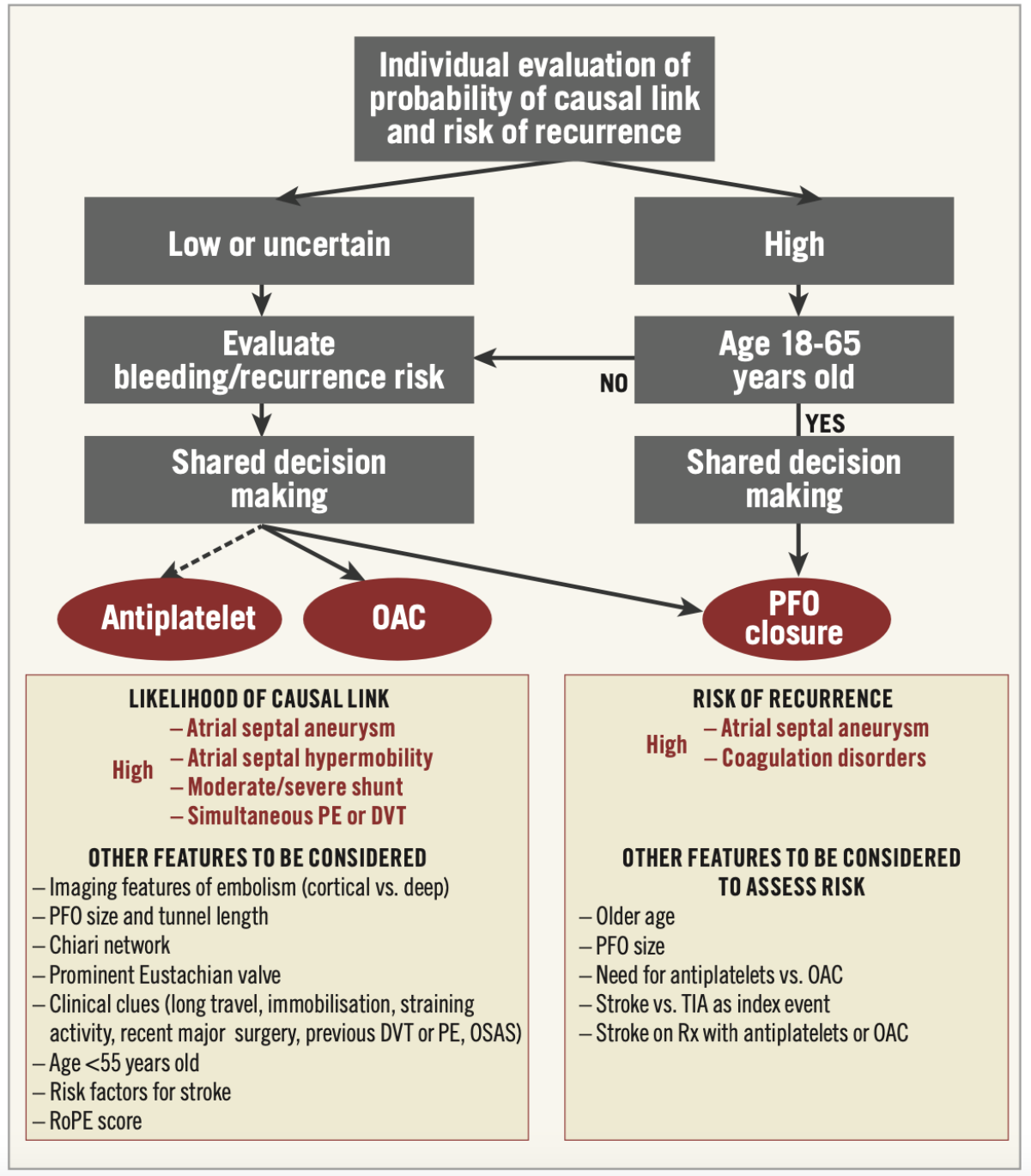
European position paper on the management of patients with patent foramen ovale. General approach and left circulation thromboembolism

Simultaneous pulmonary embolism and/or deep vein thrombosis strongly suggest a causal role of PFO	Strong	C

EuroIntervention 2018;14-onlin

European position paper on the management of patients with patent foramen ovale. General approach and left circulation thromboembolism

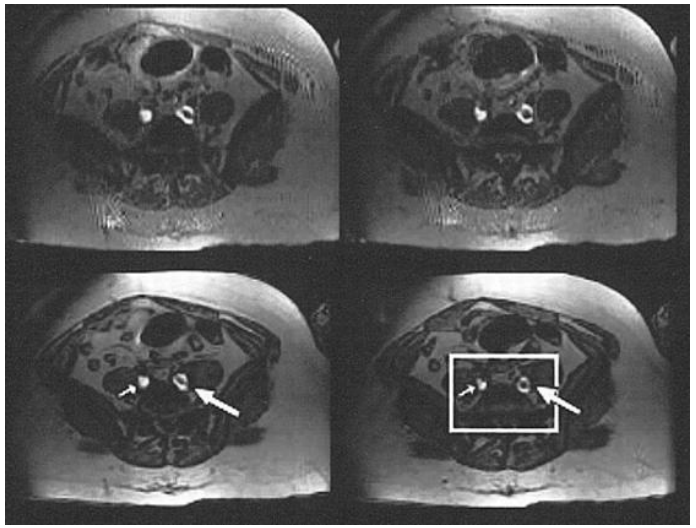


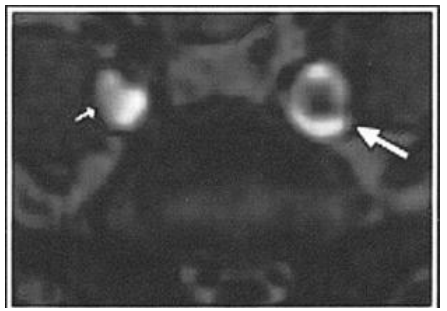


Trombóza pánevních žil a kryptogenní CMP

Pacienti s kryptogenní CMP

- Častější PFO (61% vs. 19%)
- Pánevní HŽT (20% vs. 4%)





Studie PELVIS - Stroke 2004; 35: 46-50

Journal of the Society for Cardiovascular Angiography & Interventions 1 (2022) 100039

Contents lists available at ScienceDirect

Journal of the Society for Cardiovascular Angiography & Interventions

journal homepage: www.jscai.org

Standards and Guidelines

SCAI Guidelines for the Management of Patent Foramen Ovale

- In patients with a history of pulmonary embolism (PE) requiring lifelong anticoagulation and a concomitant PFO-associated stroke, the SCAI guideline panel suggests PFO closure plus life- long anticoagulation rather than lifelong anticoagulation alone (conditional recommendation, very low certainty of evidence).
- Remark: Patients who need lifelong anticoagulation may place a lower value on the uncertain benefits of PFO closure and a higher value on the possible procedure related risks and may reasonably decline PFO closure.

Eur Respir J 2016; 48: 1377–1385

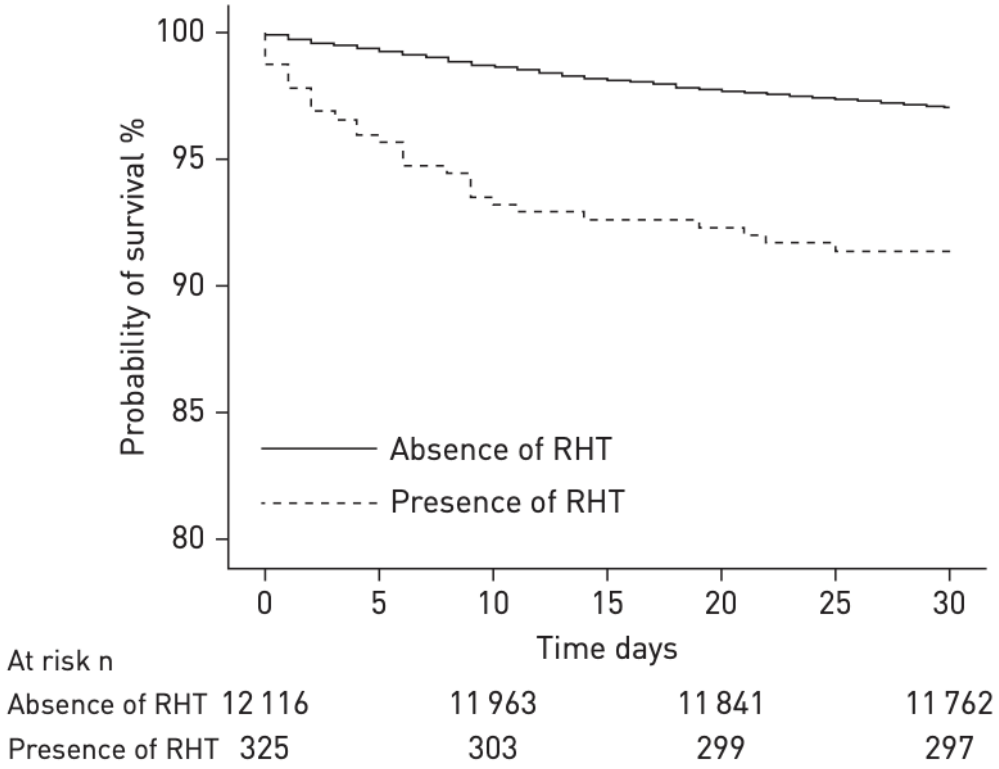
Right heart thrombi in pulmonary embolism

Deisy Barrios[1,8], Vladimir Rosa-Salazar[2,8], David Jiménez[1], Raquel Morillo[1], Alfonso Muriel[1], Jorge del Toro[3], Luciano López-Jiménez[4], Dominique Farge-Bancel[5], Roger Yusen[6] and Manuel Monreal[7], for the RIETE investigators[9]

Plicní embolie s nebo bez trombu v pravém srdci

Trombus v pravém srdci u pacientů s plicní embolii

- Prevalence cca 2,6%
- Prediktory:
  - Mladší věk
  - Anamnéza krvácení
  - Srdeční selhání
  - Karcinom
  - Synkopa
  - Systémový tlak < 100 mmHg
  - Arteriální desaturace <90%

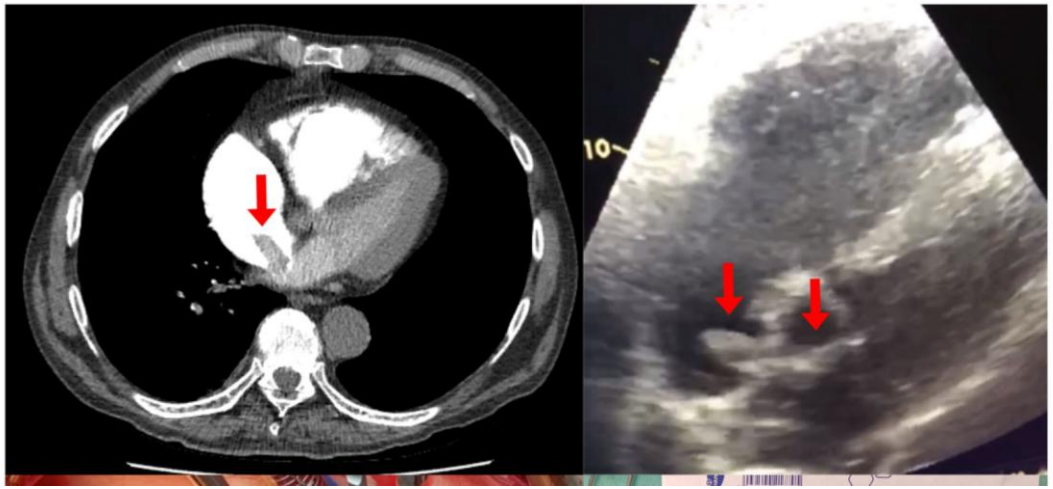


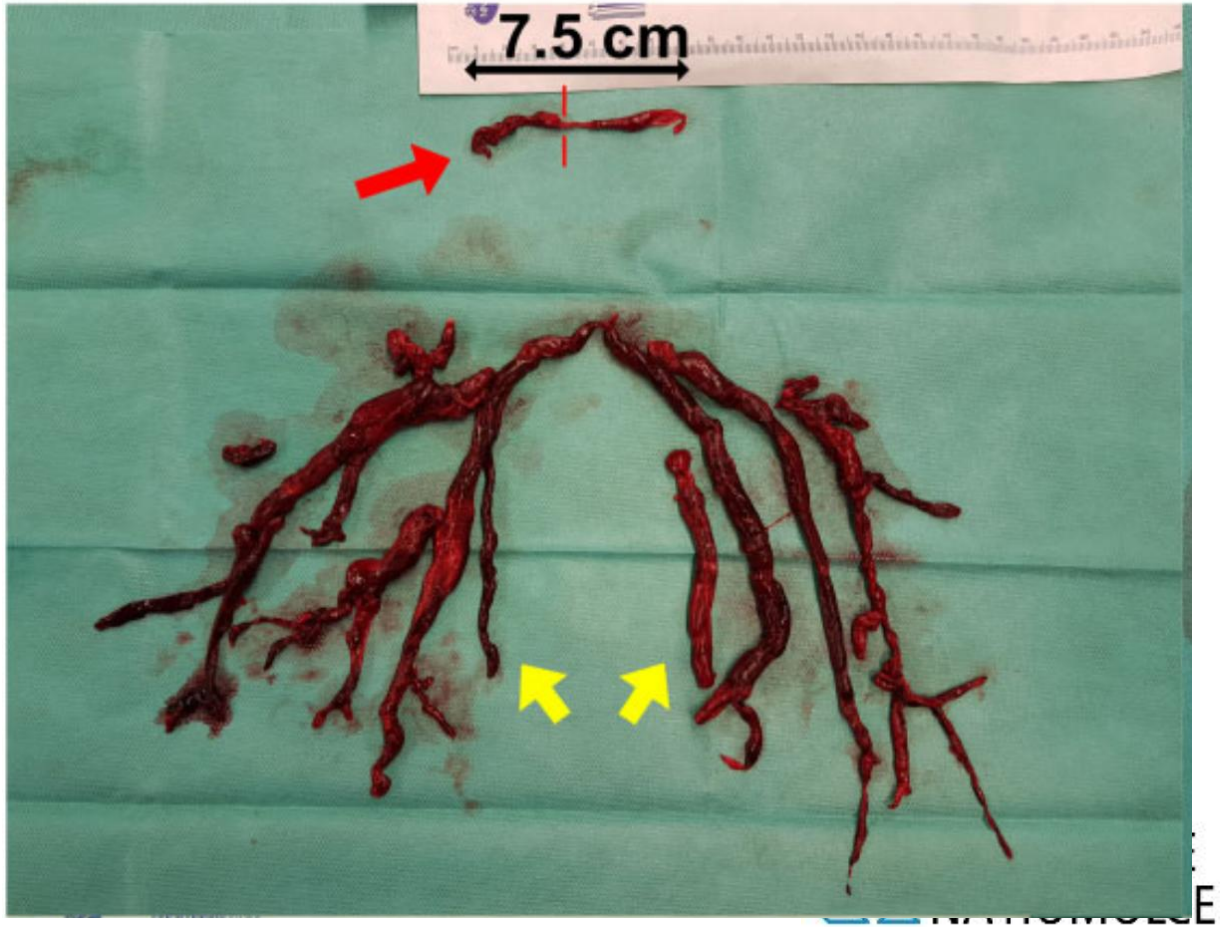
European Journal of Cardio-Thoracic Surgery 2023, 63(4), ezad022
https://doi.org/10.1093/ejcts/ezad022 Advance Access publication 20 January 2023

ORIGINAL ARTICLE

Cite this article as: Zieliński D, Zygier M, Dyk W, Wojdyga R, Wróbel K, Pirsztuk E *et al.* Acute pulmonary embolism with coexisting right heart thrombi in transit–surgical treatment of 20 consecutive patients. Eur J Cardiothorac Surg 2023; doi:10.1093/ejcts/ezad022.

Acute pulmonary embolism with coexisting right heart thrombi in transit–surgical treatment of 20 consecutive patients





CLINICAL RESEARCH STUDY

THE AMERICAN JOURNAL of MEDICINE®

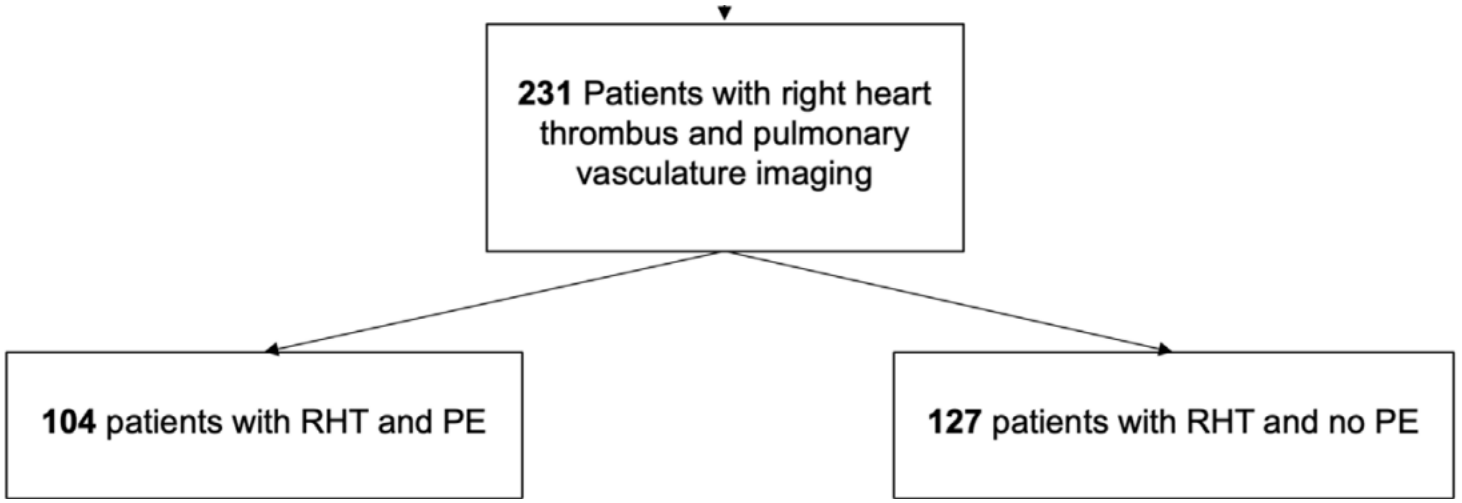
KARDIOCENTRUM

Trombus v pravém srdci s nebo bez plicní embolie

Clinical Significance of Right Heart Thrombus With and Without an Associated Pulmonary Embolism

Nathan W. Watson, BS,[a,b] Ido Weinberg, MD,[a,c] Andrew B. Dicks, MD,[a,c] Esmond Fong, MD,[a,c] Jordan B. Strom, MD,[a,b,d] Brett J. Carroll, MD,[a,b,d] Aishwarya Raja, MD,[b] Robert Schainfeld, MD,[a,c] Eric A. Secemsky, MD[a,b,d]

[a]Harvard Medical School, Boston, Mass; [b]Smith Center for Outcomes Research in Cardiology, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, Mass; [c]Division of Cardiology, Department of Medicine, Massachusetts General Hospital, Boston, Mass; [d]Division of Cardiology, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, Mass.



Typ A trombus

Vznik z hlubokého žilního systému DK

Po embolizaci mohou zůstat uváznuté v pravé síni nebo komoře, vzácně v PFO – tzv. ***thrombus-in-transit***

Echo – vysoce mobilní tromby červovitého trvaru

Typ B trombus

Immobilní hmoty, které vznikají přímo v pravém srdci. Mohou souviset s přítomností katetrů, elektrod

NEMOCNICE NA HOMOLCE

Trombus v pravém srdci

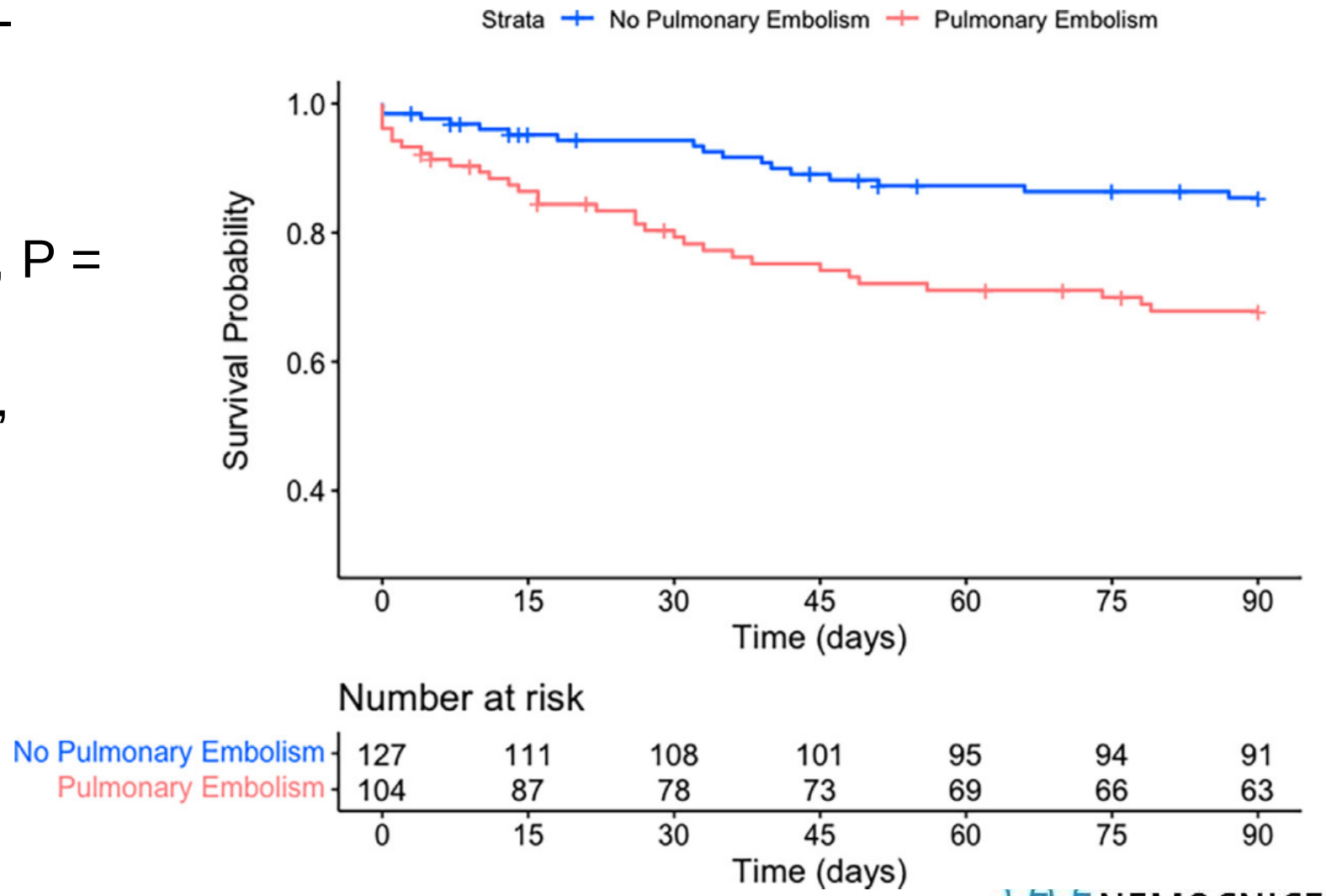
Mortalita ve 14 dnech a 3 měsících

14 dní: 21% vs 11%, P = 0,032

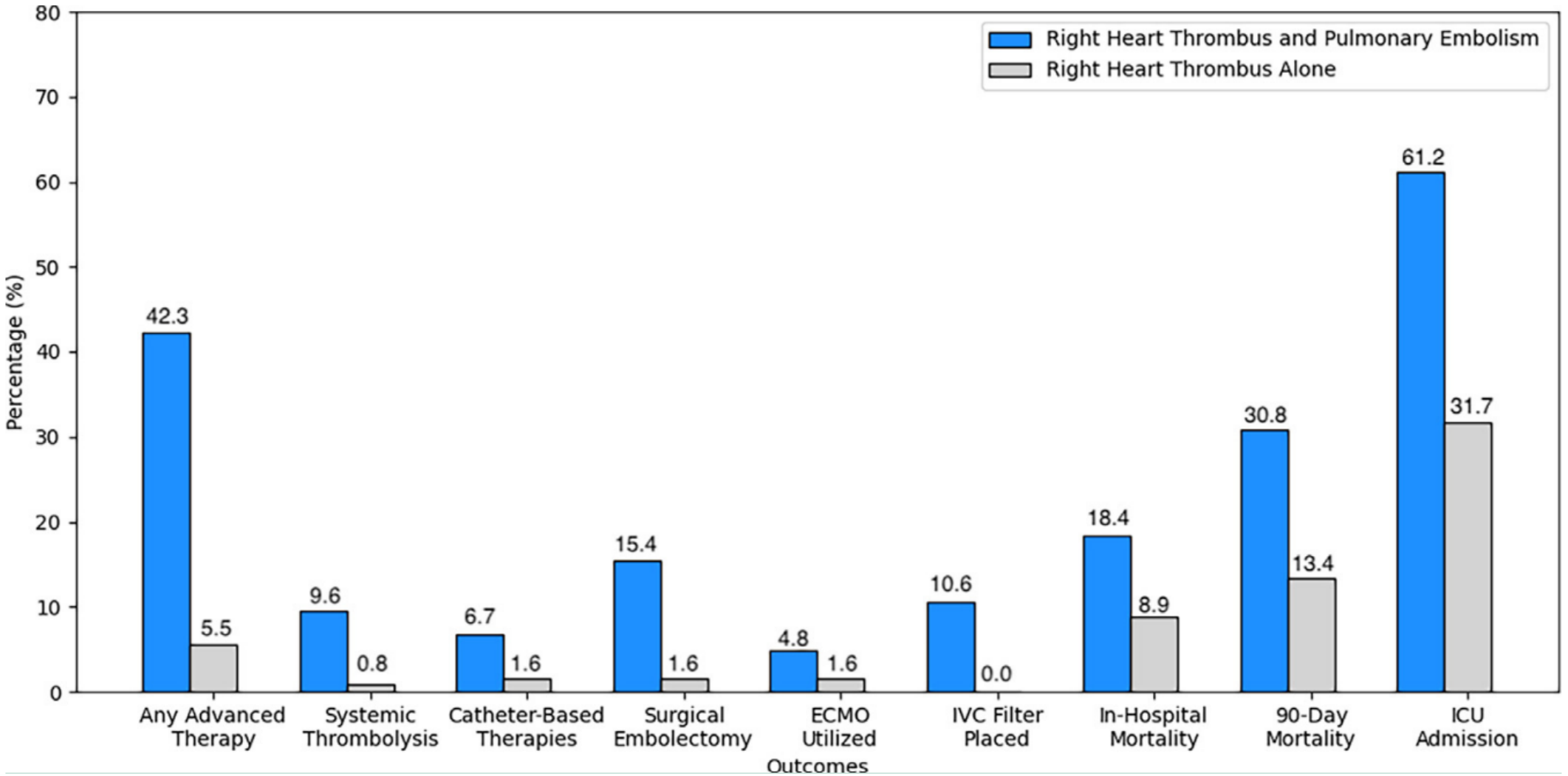
3 měsíce: 29% vs 16%, P=0,036

Trombus typ A vs. B

Mortalita 42% vs. 4%



The American Journal of Medicine (2023) 136:1109–1118



The American Journal of Medicine (2023) 136:1109–1118

Outcome of patients with right heart thrombi: the Right Heart Thrombi European Registry

Marcin Koć[1], Maciej Kostrubiec[1], Waldemar Elikowski[2], Nicolas Meneveau[3], Mareike Lankeit[4], Stefano Grifoni[5], Agnieszka Kuch-Wocial[6], Antoniu Petris[7], Beata Zaborska[8], Branislav S. Stefanović[9], Thomas Hugues[10], Adam Torbicki[11], Stavros Konstantinides[12] and Piotr Pruszczyk[1] for the RiHTER Investigators

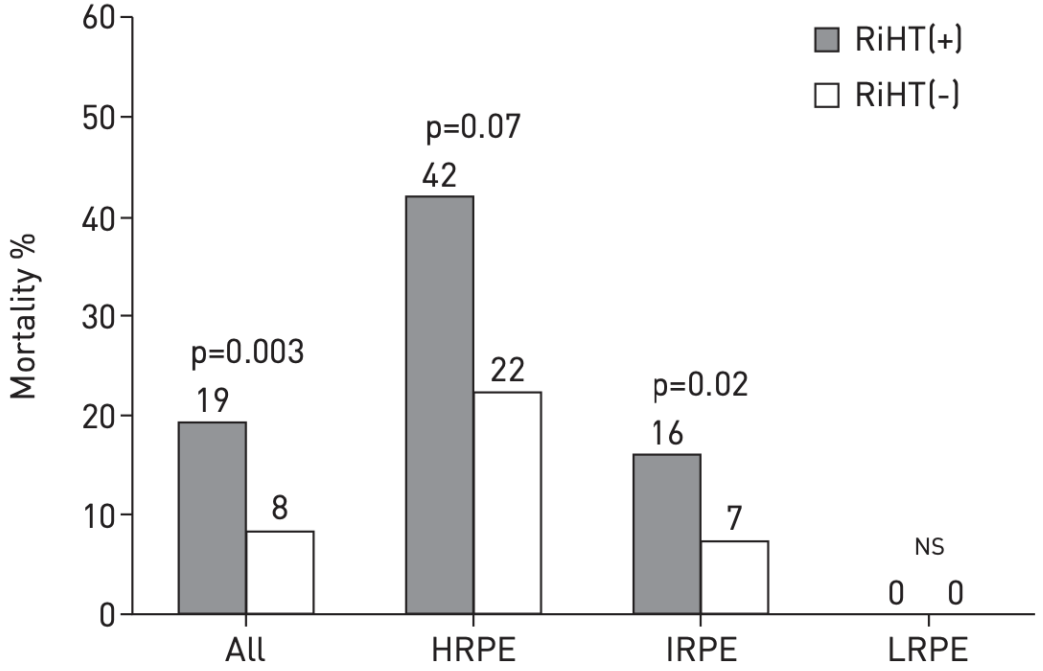


FIGURE 2 30-day pulmonary embolism-related mortality in 138 patients with right heart thrombi (RiHT(+)) and 276 propensity score-matched controls (RiHT(–)). HRPE: high-risk pulmonary embolism; IRPE: intermediate-risk pulmonary embolism; LRPE: low-risk pulmonary embolism.

Eur Respir J 2016; 47: 869–875

Original Article

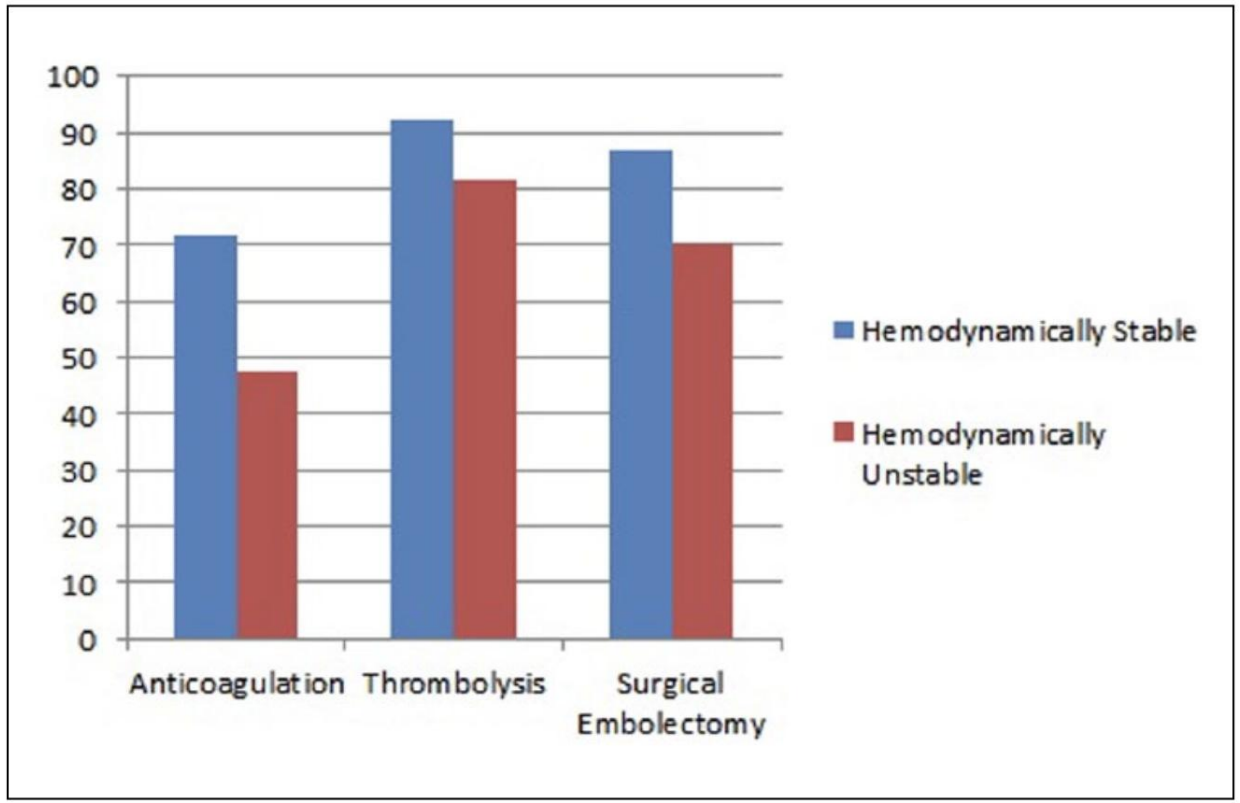
VASCULAR MEDICINE

Vascular Medicine
2015, Vol. 20(2) 131–138

DOI: 10.1177/1358863X15569009
vmj.sagepub.com
SAGE

Comparative efficacy of different modalities for treatment of right heart thrombi in transit: A pooled analysis

Ganesh Athappan, Prasanna Sengodan, Paul Chacko and Sanjay Gandhi



	Variable	OR	95% CI	*p*-value
I	**Univariate logistic regression analysis for predictors of survival**			
1	Age	0.97	0.95–0.99	0.01
2	Hemodynamic status			
	• Stable	1		
	• Unstable	0.44	0.20–0.97	0.04
3	Therapeutic approach			
	• No therapy	1		
	• Anticoagulation	16.92	2.05–139.87	0.009
	• Thrombolysis	61.76	7.42–513.81	0.000
	• Catheter-directed	40	1.98–807.1	0.016
	• Surgical embolectomy	44.54	5.42–366.32	0.000
II	**Multivariate logistic regression analysis for predictors of survival**			
1	Age	0.98	0.96–1.01	0.28
2	Hemodynamic status			
	• Stable	1		
	• Unstable	0.36	0.14–0.91	0.03
3	Therapeutic approach			
	• Anticoagulation	1		
	• Thrombolysis	4.83	1.51–15.36	<0.000
	• Surgical embolectomy	2.61	0.90–7.58	0.078

The total number of patients included in the multivariate analysis was 157. The anticoagulation, thrombolysis and surgical embolectomy arms had 29, 57 and 61 patients, respectively.

Závěr

Plicní embolie a PFO a systémové embolizace

- Považuje se za kauzální vztah
- Dobře dokumentovaná a popsaná komplikace PE
- Embolizace do CNS jsou častěji asymptomatické
- Není specifické doporučení pro postup u pacientů s PE

Plicní embolie a trombus v pravém srdci (*trombus-in-transit*)

- U plicní embolie je nález trombu relativně méně častý
- Trombus v pravém srdci – prediktor mortality
- Trombolýza a embolektomie je pravděpodobně výhodnější než konzervativní postup

Pro obě výše popsané klinické situace je relativně málo dat