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Anesteziologové a peroperační TEE v ČR

Jan Kunstýř

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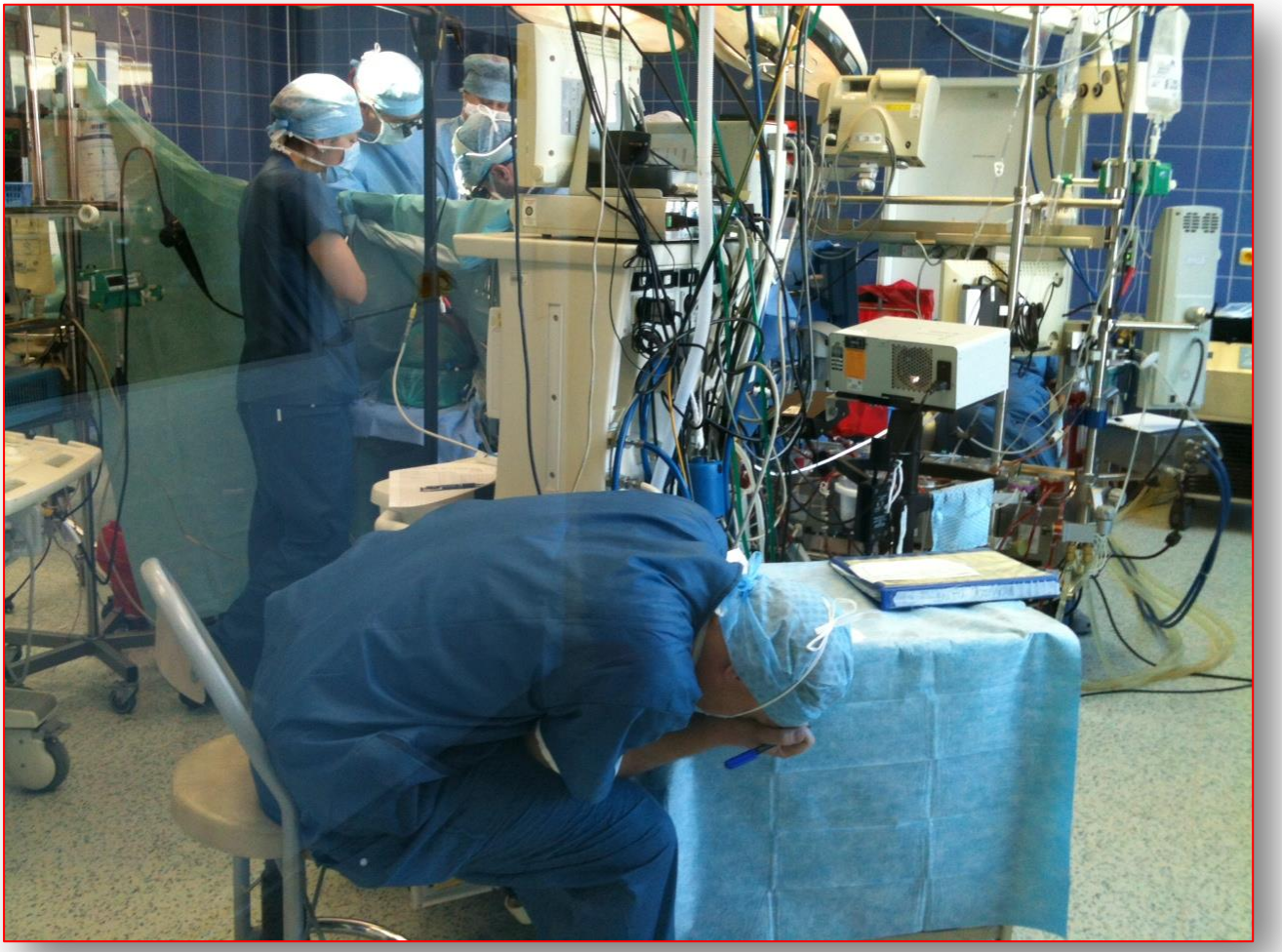

TEE na operačním sále

British Journal of Anaesthesia 97 (1): 77–84 (2006)
doi:10.1093/bja/ael122 Advance Access publication June 1, 2006

BJA

Transoesophageal echocardiography (TOE) in the operating room

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tion coming from the echo machine. In current practice in the UK, TOE is said to account for around 10% of all echocardiograms performed, but of these TOEs, 90% are performed not by cardiologists but, by cardiac anaesthetists.

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Journal of Cardiothoracic and Vascular Anesthesia, Vol 28, No 1 (February), 2014: pp 54–63

Multinational Institutional Survey on Patterns of Intraoperative Transesophageal Echocardiography Use in Adult Cardiac Surgery

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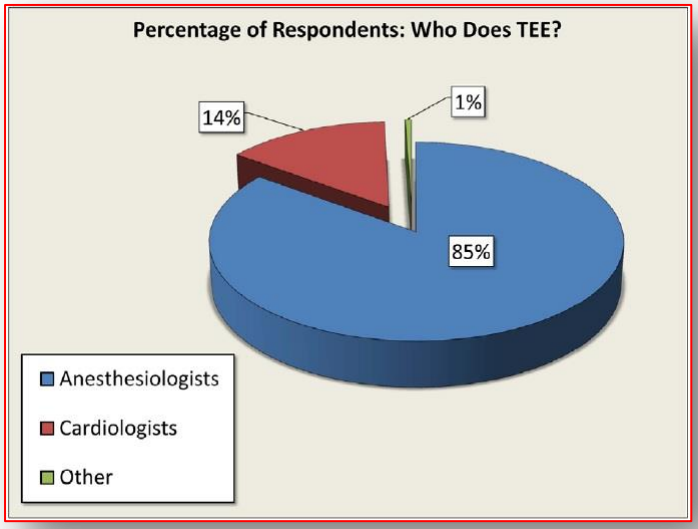

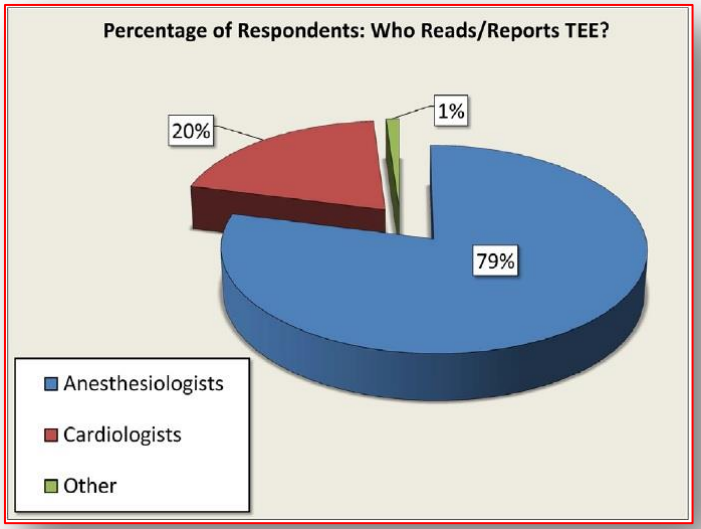

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Peroperační TEE v rukou anesteziologů?!

- Specifické podmínky během vyšetření
  - UPV
  - celková anestezie
  - supinní poloha
  - polohování srdce
  - mimotělní oběh
  - mechanické podpory
- Časová náročnost
  - opakovaná vyšetření za různých HD podmínek
  - stav „před“ a „po“ + návaznost na ICU
  - množství vyšetření (mezi indikace I A patří HD nestabilita během jakékoliv operace)
- Ekonomická náročnost

Peroperační změna chir.postupu

Anaesthesia
Journal of the Association of Anaesthetists of Great Britain and Ireland

Anaesthesia, 2009, **64**, pages 947–952 doi:10.1111

The impact of intra-operative transoesophageal echocardiography on cardiac surgical practice

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Summary

The use of transoesophageal echocardiography during cardiac surgery has increased dramatically and it is now widely accepted as a routine monitoring and diagnostic tool. A prospective study was carried out between September 2004 and September 2007, and included all patients in whom intra-operative echocardiography was performed, 2 473 (44%) out of a total of 5 591 cases. Changes to surgery were subdivided into predictable (where echocardiographic examination was planned specifically to guide surgery) and unpredictable (new pathology not diagnosed pre-operatively). A change in the planned surgical procedure was documented in 312 (15%) cases. In 216 (69%) patients the changes were predictable and in 96 (31%) they were unpredictable. The number of predictable changes increased between 2004–5 and 2006–7 (8% vs 13%, $p = 0.025$). In these cases, intra-operative echocardiography was specifically requested by the surgeon to help determine the operative intervention. This has implications for consent and operative risk, which have yet to be fully determined.

Neočekávané změny indikace

Change to planned surgical procedure	Procedure added	Procedure not performed
Aortic valve replacement	13	9
Mitral valve replacement or repair	7	17
Tricuspid valve repair	20	1
Repair or replacement of aortic root or ascending aorta	5	4
Myomectomy	7	0
Thrombectomy	5	0
Closure of atrial septal defect or patent foramen ovale	5	0
Other	3	0
Total	96	

A Review of 364 Perioperative Rescue Echocardiograms: Findings of an Anesthesiologist-Staffed Perioperative Echocardiography Service

Nicholas W. Markin, MD, Benjamin S. Gmelch, MD, Matthew J. Griffee, MD, Timothy J. Holmberg, MD, David E. Morgan, MD, and Joshua M. Zimmerman, MD, FASE

Objective: Review the findings and use of rescue echocardiography performed by the Division of Perioperative Echocardiography and its impact on patient management.

Design: Retrospective observational study.

Setting: Single institution, tertiary care hospital.

Participants: Three hundred sixty-four consecutive rescue echocardiograms in the perioperative setting.

Interventions: Rescue transesophageal or rescue transthoracic echocardiography.

Measurements and Main Results: Of a total of 1,675 perioperative echocardiograms performed in a 28-month period, 364 (21.8%) were rescue studies. Of these, 95.9% were transesophageal and 4.1% were transthoracic. Location at time of rescue echocardiography was intraoperative (55.5%), postoperative (44.2%), and preoperative (0.3%). No single diagnosis predominated the intraoperative or postoperative environment, and the frequency of common etiologies did not allow for assumption. There was a change in management for 214 patients (59%) as the result of findings. The methods used in performing rescue echocardiography at the authors' institution are reported.

Conclusions: The heterogeneity of diagnoses and the frequency with which rescue echocardiography changed management further supports the growing body of evidence that the hemodynamically unstable perioperative patient benefits from its use.

KEY WORDS: rescue echocardiography, hemodynamic instability, transesophageal echocardiography, transthoracic echocardiography, intraoperative hypotension

Table 3. Characteristics of the Rescue Echocardiograms Performed

Type of Echocardiogram	TEE n (%)	TTE n (%)
Total (%)	349 (95.9%)	15 (4.1%)
Location of rescue study		
Preoperative	1 (0.3%)	0
Intraoperative	199 (57.0%)	3 (20%)
Postoperative	149 (42.7%)	12 (80%)
PACU	0	7 (43.8%)
ICU	149 (42.7%)	5 (33.3%)

Změny terapie na základě „rescue“ TEE/TTE

Table 5. Management Changes as a Result of Rescue Echocardiography Findings

Management Changes	Number of Rescue Echocardiograms Showing Management Change		
N = 364	Total (%)	Intraoperative n = 202 n (%)	Postoperative n = 162 n (%)
All management changes*	214 (58.8%)	126 (62.4%)	87 (53.7%)
Fluid administration	113 (31.0%)	83 (41.1%)	30 (18.5%)
Inotropes	64 (17.6%)	34 (16.8%)	30 (18.5%)
Epinephrine	38	27	11
Milrinone	14	5	9
Dobutamine	8	2	6
Ephedrine	1	1	0
Unspecified	7	2	5
Vasopressors	40 (11.0%)	25 (12.4%)	15 (9.3%)
Vasopressin	25	17	8
Norepinephrine	19	10	9
Phenylephrine	39	9	0
Methylene Blue†	1	0	1
Unspecified	3	1	2
Inhaled vasodilators	8 (2.2%)	3 (1.5%)	5 (3.1%)
Diuretics	5 (1.4%)	1 (0.5%)	4 (2.5%)
Surgical changes‡	27 (7.4%)	9 (4.5%)	17 (10.5%)
Other medical changes	18 (4.9%)	11 (5.4%)	7 (4.3%)

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REVIEW

Volume 28 • Number 1 • February 2015

CURRENT OPINION

Expanding role of perioperative transesophageal echocardiography in the general anesthesia practice and residency training in the USA

W. Brit Smith, Albert R. Robinson III, and Gregory M. Janelle

- **TEE u neKCH operací vedlo ke změnám léčby až v 60%**
- **Cévní chirurgie**
  - pacienti často současně trpí i kardiálním onemocněním
- **Ortopedie**
  - embolizace především během intramedulárních výkonů
- **TRX jater**
  - v současnosti 38% center používá při TRX jater TEE rutinně
- **Neurochirurgie**
  - vzduchová embolie při kraniotomiích v sedě
- **Urologie**
  - grawitz tu prorůstající do kaválního systému
- **Intenzivní péče**
  - miniaturizovaná, biplane TEE sonda na jedno použití

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Doporučení pro peroperační TEE

■ PRACTICE GUIDELINES

Anesthesiology
1996; 84:986–1006

Lippincott–Raven Publishers

Practice Guidelines for Perioperative Transesophageal Echocardiography

A Report by the American Society of Anesthesiologists and the Society of Cardiovascular Anesthesiologists Task Force on Transesophageal Echocardiography

ASE/SCA Guidelines for Performing a Comprehensive Intraoperative Multiplane Transesophageal Echocardiography Examination: Recommendations of the American Society of Echocardiography Council for Intraoperative Echocardiography and the Society of Cardiovascular Anesthesiologists Task Force for Certification in Perioperative Transesophageal Echocardiography

Jack S. Shanewise, MD*, Albert T. Cheung, MD†, Solomon Aronson, MD‡,

SPECIAL ARTICLES

Anesthesiology 2010; 112:1084–96

Practice Guidelines for Perioperative Transesophageal Echocardiography

*An Updated Report by the American Society of Anesthesiologists and the Society of Cardiovascular Anesthesiologists Task Force on Transesophageal Echocardiography**

Recommendations for cardiac and thoracic aortic surgery. For adult patients without contraindications, TEE should be used in all open heart (*e.g.*, valvular procedures) and thoracic aortic surgical procedures and should be considered in coronary artery bypass graft surgeries to: (1) confirm and refine the preoperative diagnosis, (2) detect new or unsuspected pathology, (3) adjust the anesthetic and surgical plan accordingly, and (4) assess the results of surgical intervention. In small children, the use of TEE should be considered on a case-by-case basis because of risks unique to these patients (*e.g.*, bronchial obstruction).

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Využití peroperační TEE kardioanesteziology v České republice

- Národní dotazníkový průzkum
- Cílem bylo zjistit, jak je českými kardioanesteziology používána TEE
- Elektronický dotazník:
  - počty anesteziologů, kteří mají akreditaci z TEE či se na ní připravují
  - typy operací a situací, kdy je indikována TEE
  - důvody, proč není TEE častěji používána
  - zájem anesteziologů o echoedukaci

Výsledky průzkumu

- Dostupnost TEE – 100 % center 7/24, zajištěna převážně kardiology
- Anesteziologové, akreditovaní v perop. TEE – 13 %
- Centra, kde anesteziologové v ČR rutinně TEE provádějí – 25 %
- Zájem o další edukaci v TEE – 92 %
- Nejčastější příčiny, proč se TEE neprovádí:
  - nedostatek techniky
  - nedostatek erudovaného personálu

Indikace k TEE

	Centra, v nichž je vždy TEE pro danou indikaci použita	
	n	%
Záchovné chlopenní operace	12	100
Korekce zkratových vad	10	83
Rozhodování o inotropní podpoře před odpojením od MTO	7	58
Operace pacientů s dysfunkcí LK	1	8
Náhrady chlopní	1	8
Všechny KCH operace	0	0

Evropská TEE akreditace

Adult Transesophageal Echocardiography (TEE)

The successful completion of the EAE/EACTA certification provides the formal and European recognition for individuals, governed by a scientific society.

ECHO INDIVIDUAL CERTIFICATION

EUROPEAN ASSOCIATION OF Echocardiography

The TEE exam will take place in Athens during the EUROECHO & other Imaging Modalities Congress 2012, on **7 December 2012 from 8:00 to 13:00**. Online Registration will be available until the **26 November 2012.**

- **1. část: 2x za rok test – EuroEcho, EACTA**
  - 50 smyček/obrázků, 60 min MCQ 1/5
  - 100 otázek z teorie, 180 min MCQ 1/5
  - 65 % cut off
- **2. část:**
  125 dokumentovaných TEE reportů / 12 měsíců
- **Platnost akreditace 5 let, obnovení po předložení 250 reportů a 30 CME kreditů**

Účely evropské TEE akreditace

- Umožnit, aby se pacientům dostalo vždy vyšetření od kvalifikované osoby
- Připravit lékaře na to, aby byli schopni provádět samostatně rutinní peroperační TEE vyšetření
- Nicméně, právo autorizovat závěry těchto vyšetření je v jednotlivých zemích definováno tam platnými zákonnými předpisy a nařízeními

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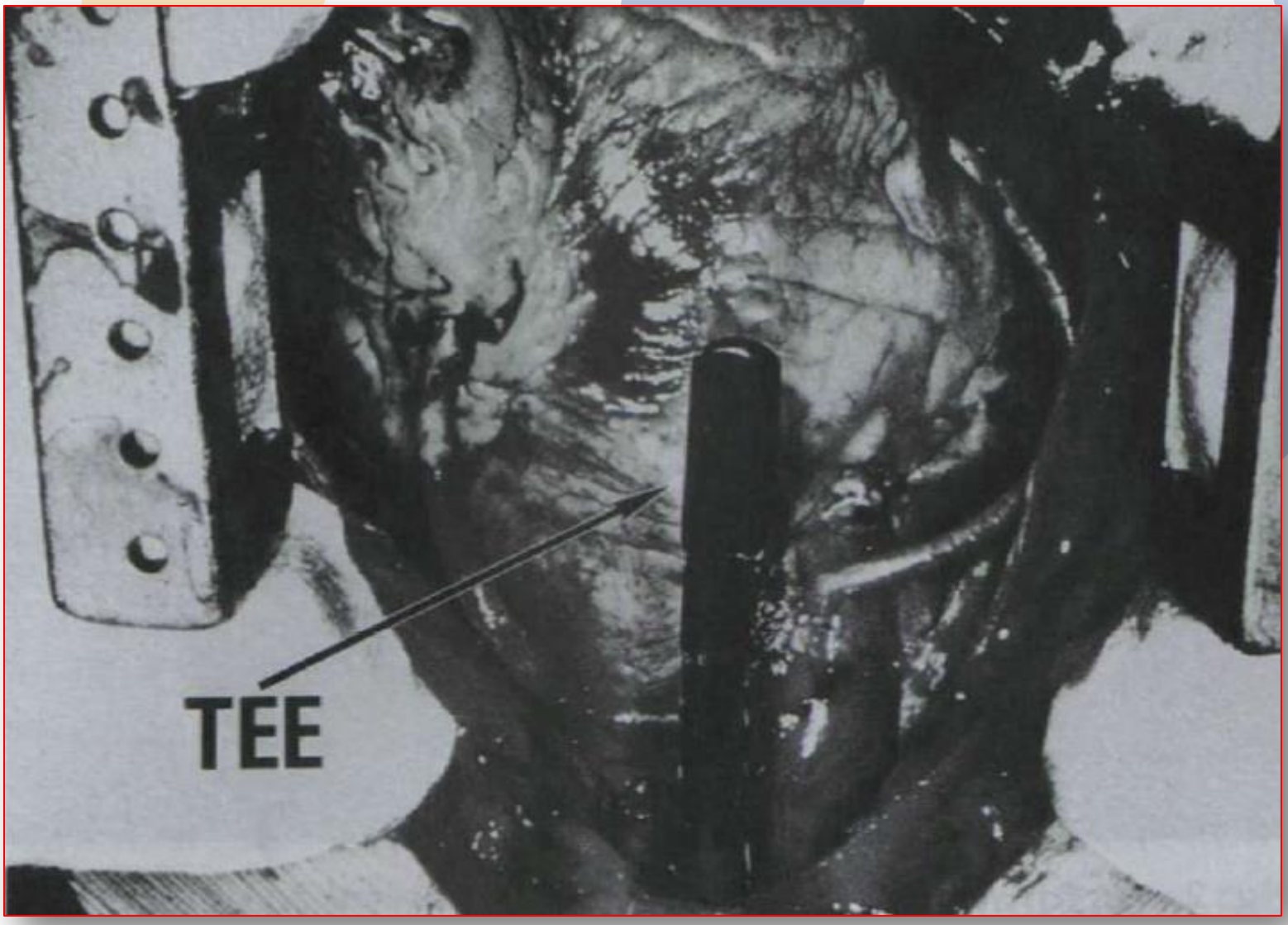
Závěr

- Implementace doporučení ASA/SCA nebude možná bez širšího zapojení anesteziologů
- Rozšiřuje se použití peroperační TEE i mimo kardiochirurgii
- Jsou nutné významné investice do techniky a edukace
- Spolupráce s kardiology v jednotlivých centrech i na úrovni vedení odborných společností
- Edukace vede ke zlepšení postavení českých lékařů na pracovním trhu
- Nastolené otázky:
  Forenzní důsledky?
  Platba pojišťoven?


TEE