Intraoperative TEE: interpretation and judgement

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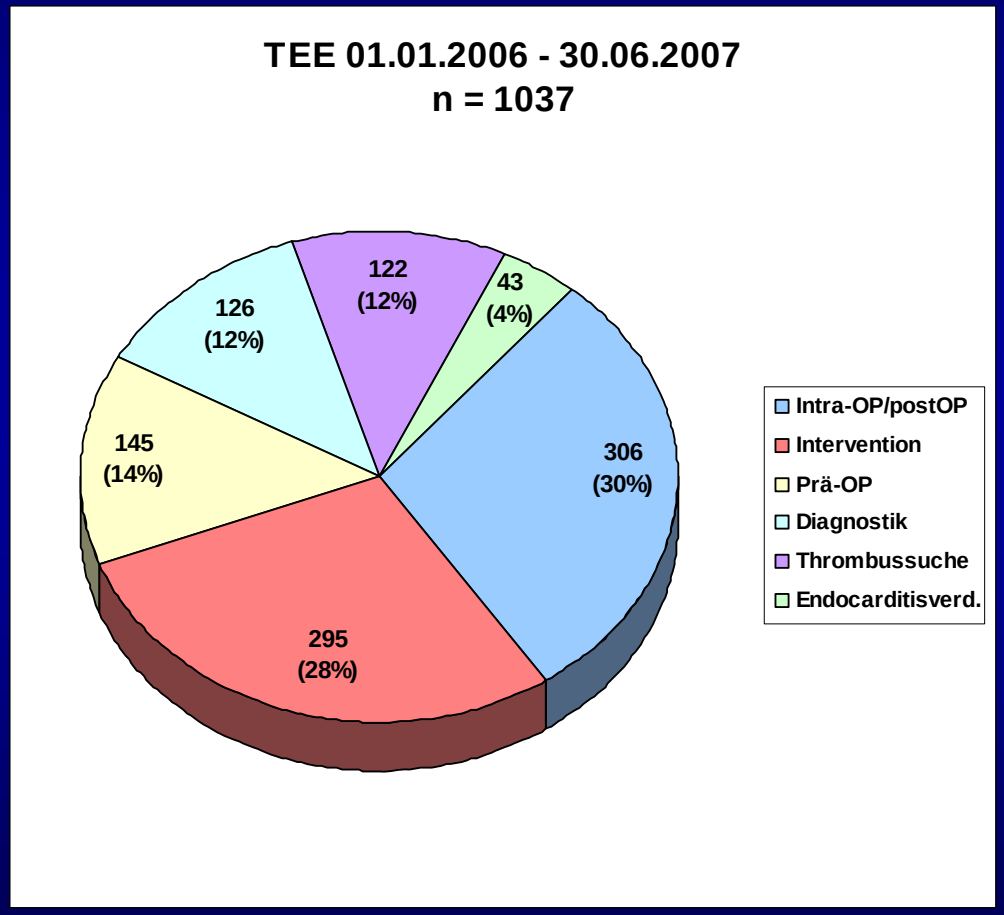
TEE indications DHM

7000 TEE in 14 y



iTEE sign. Impact: 14%

Why should we perform iTEE?

- Online measurement of surgical quality
- iTEE helps avoiding reoperation
- Mayo Clinic: n=1002, prosp. Study:
  major impact pre/post 14% (Lit 12 - 19%)
- DHZ: retrospective n=1037, major impact 14%
- iTEE is cost-effective and good for patients
- ASA Guidelines: iTEE category I indication

Guidelines ASA: Anaesthesiology 1996;84:986-1006
Randolph. J Thorac Cardiovasc Surg 2002;124:1176-82

Who should perform iTEE?

- Who should perform the TEE?
  - best skilled in TEE, morphology and hemodynamics of CHD
- Who should have an I-TEE?
  - any patient with intracardiac repair/great arteries
  - not indicated in surgical PDA/PFO-closure
  - children >3 kg of weight

Stevenson J Am Soc Echocardiography 1999,12;3:165-72

TEE complications

- adults: 0.2 - 0.3% major and minor
- pediatric: 1.6 - 4.9% major and minor
  - related to weight: <3 kg elevated risk
  - major complication: perforation of pharynx
  - airway obstruction 3% <15 kg
  - *mild mucosal injury 44% <9 kg, 24 %>9kg during intraoperative TEE (mean 248 min.)
  - Cave: Microdeletion 22Q11 - hypopharynx

***Greene Chest 1999; 116:1247-50**

How to do iTEE?

- Put the probe in before the operation
- Place it under visual control (with intubation)
- Leave it in the stomach not oesophagus
- Freaze the echomachine – no warming at the tip
- Wait some minutes after weaning from bypass

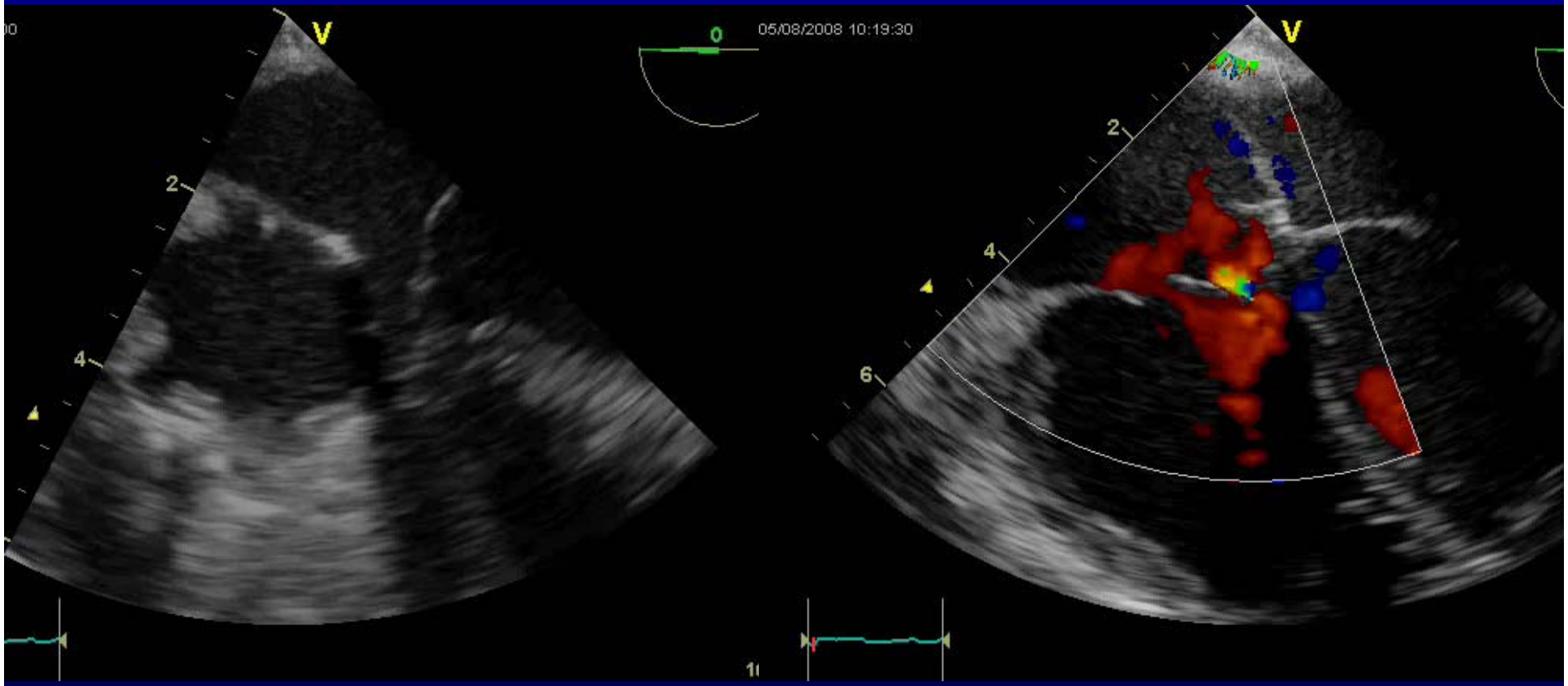
Congenital iTEE indications

- Septal defects (ASD, VSD, AVSD)
- AV-valves (Ebstein, AVSD, MVP)
- Complex intraatrial rerouting
    - Senning, Mustard, LVCS->RA
- Complex intraventricular rerouting
    - Rastelli, Nikaido,
- Semilunar valve surgery
    - Ao (David-OP, replacement),
- Hybrid operations

Goals of iTEE

- Complete evaluation of the whole heart!
- Monitoring of the surgical procedure
- Monitoring of ventricular function
- Monitoring of potential side effects
  - Vein damage after cannulation
  - Vascular damage after cannulation
- Initiate a process of decision finding

Septal defects: ASD I

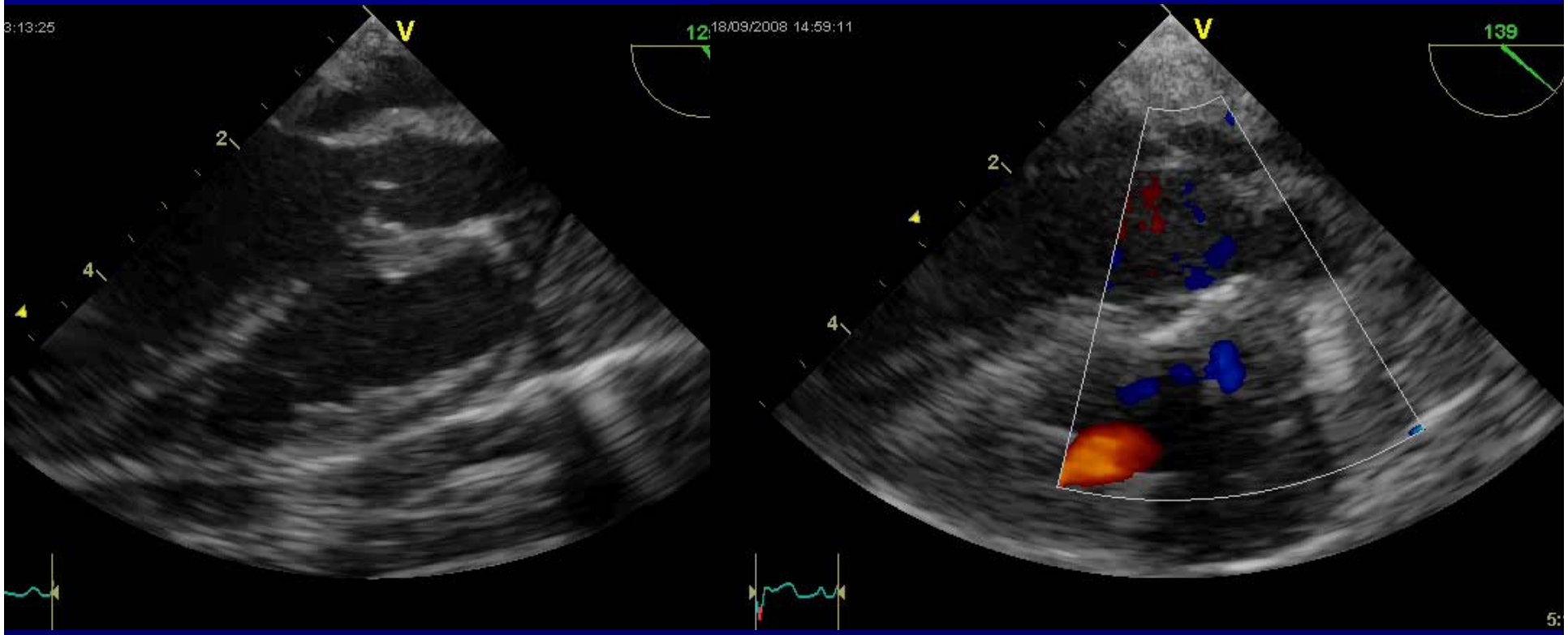


Pre-OP

10 y boy

Post-OP

Septal defects: VSD

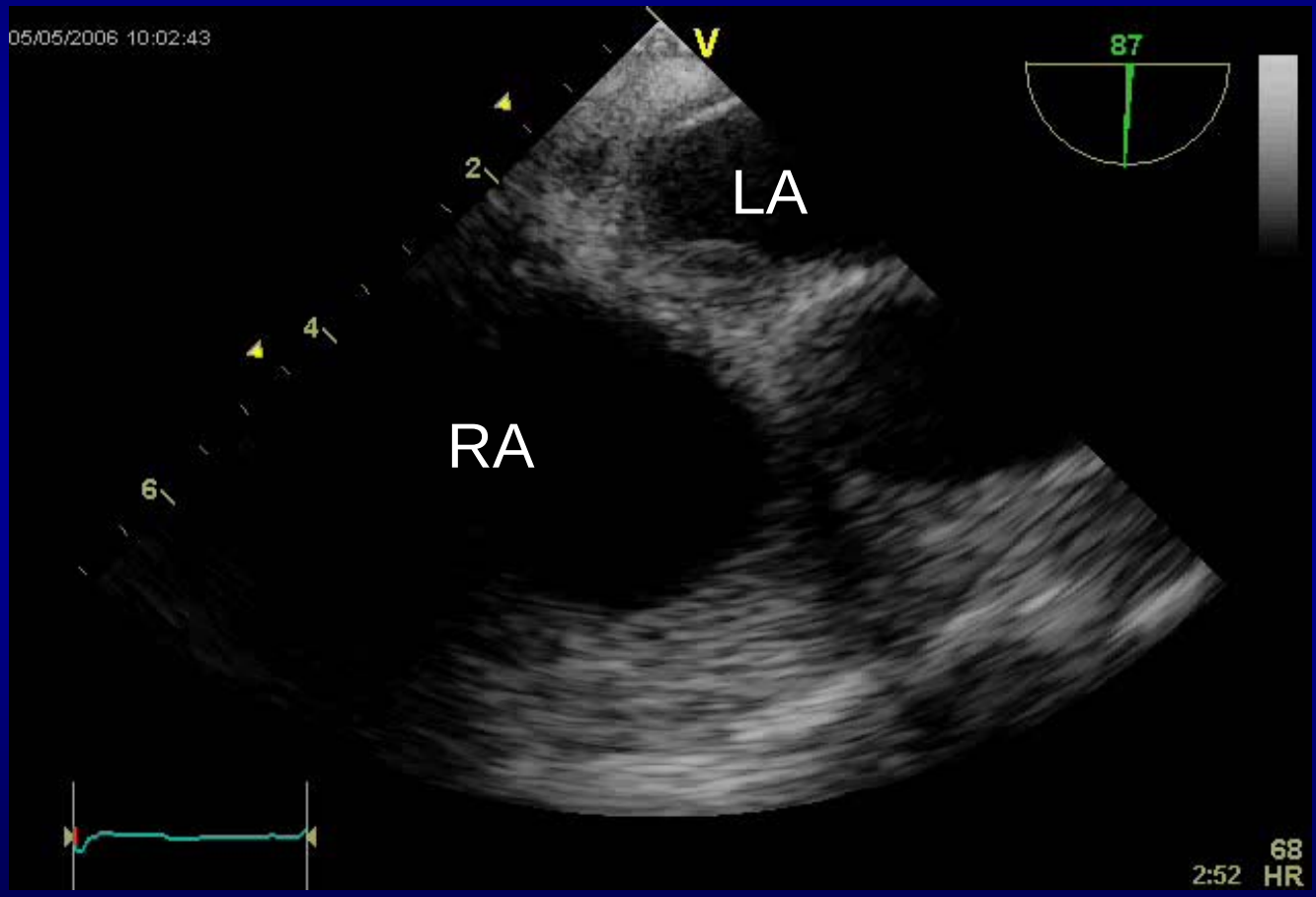


Pre-OP

4 months boy

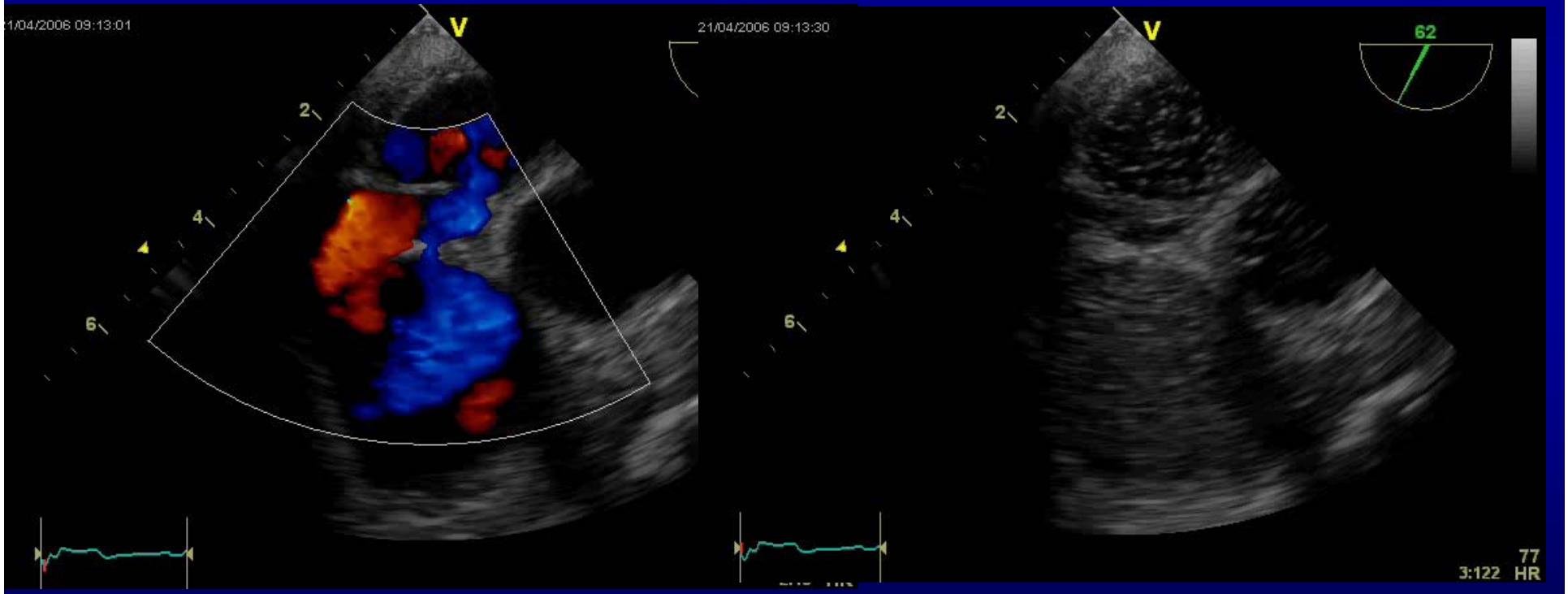
Post-OP

Should we screen simple leasions?



6 y boy, 6 months VSD/PFO-closure. After OP: unclear cyanosis

Should we screen simple leasions?



6 y boy, 6 months VSD/PFO-closure. After OP: unclear cyanosis

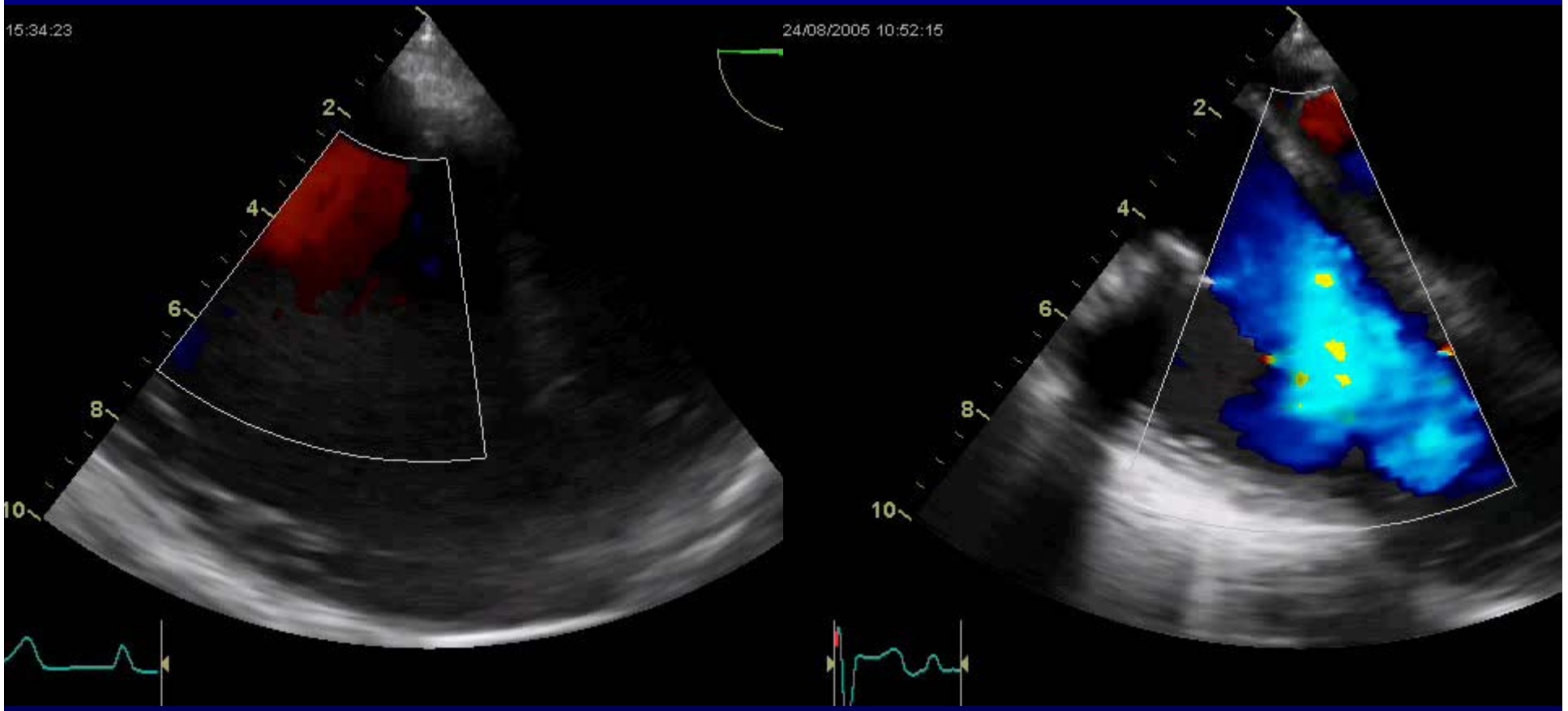
Tricuspid function

Pre-OP

12 y female Ebstein

Post-OP

Tricuspid function

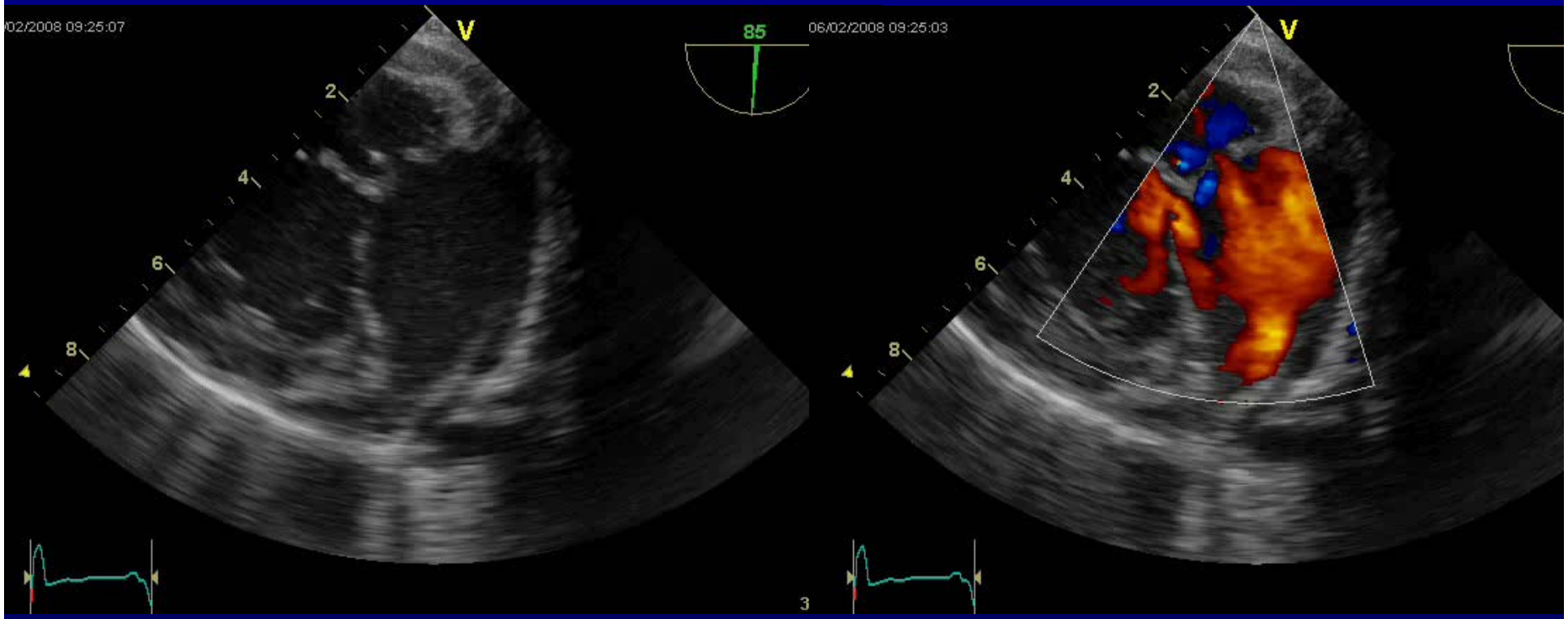


Pre-OP

24 y female Ebstein

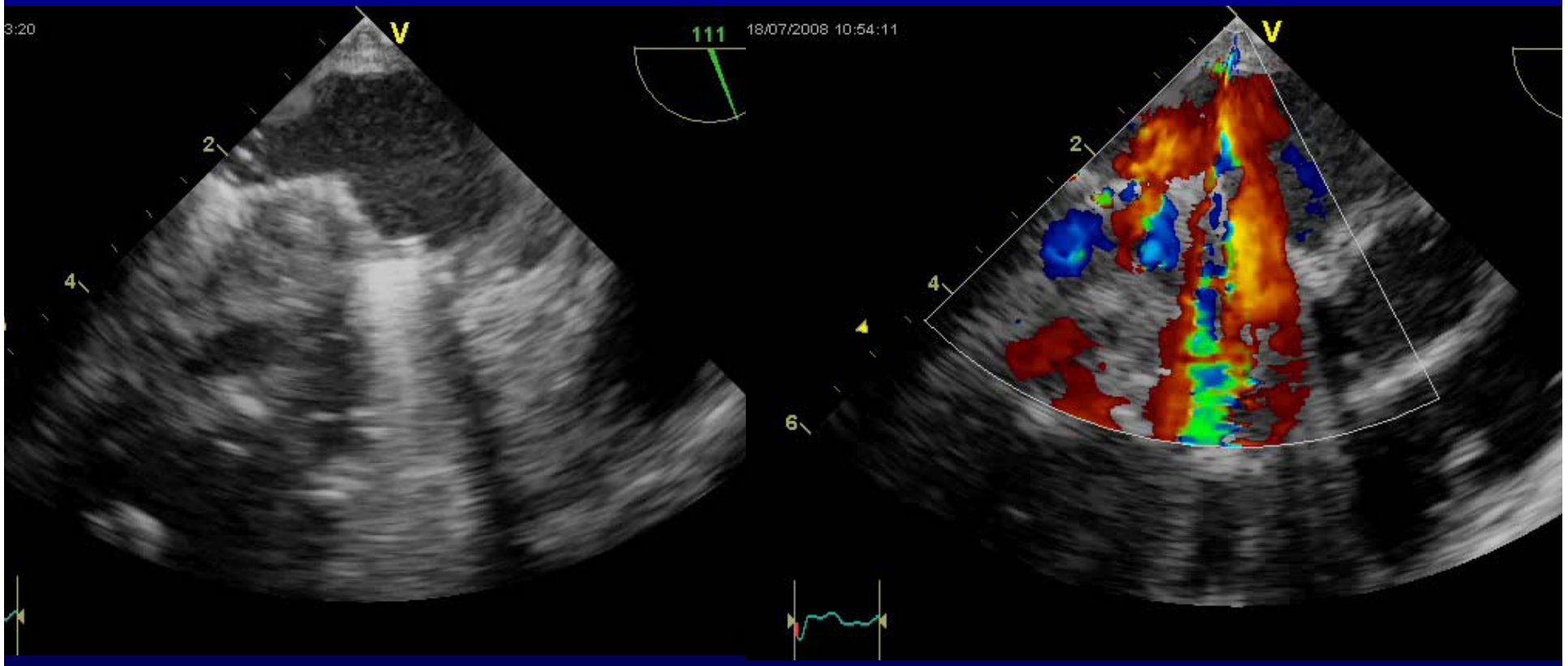
Post-OP

Mitral valve: double orifice



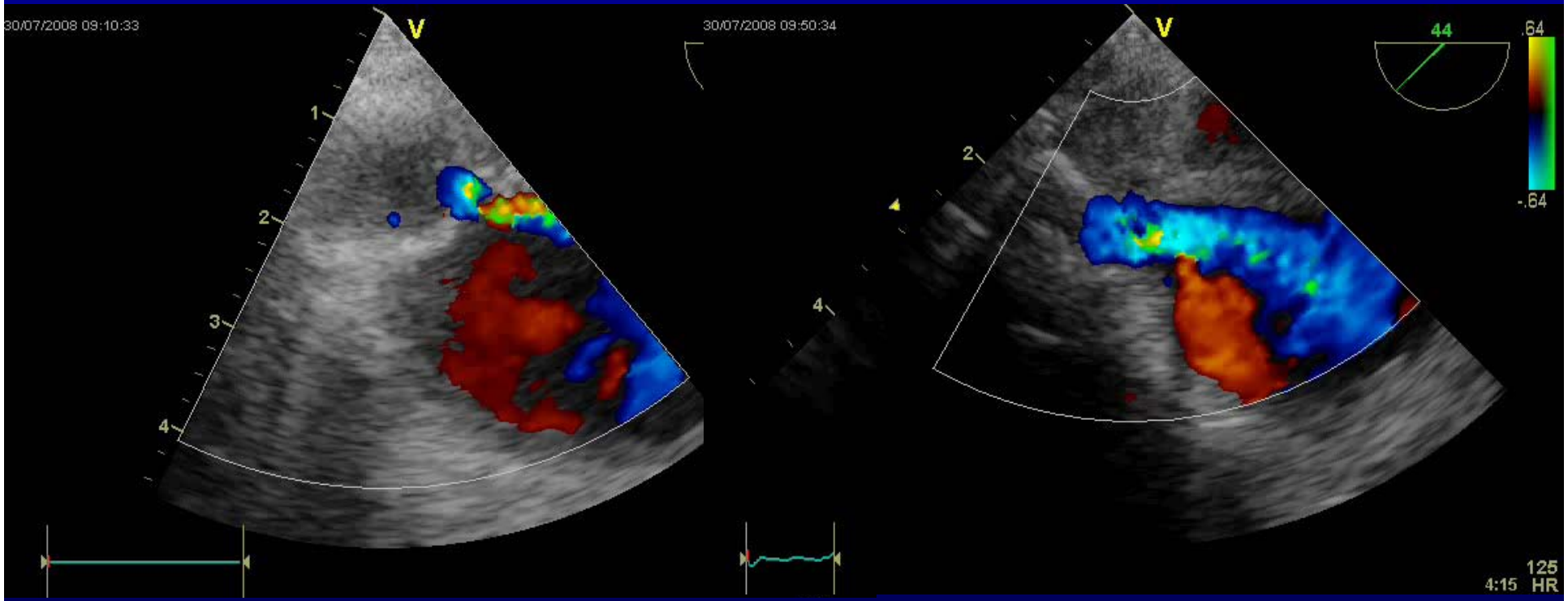
8 y girl: severe mitral regurgitation

Mitral valve replacement

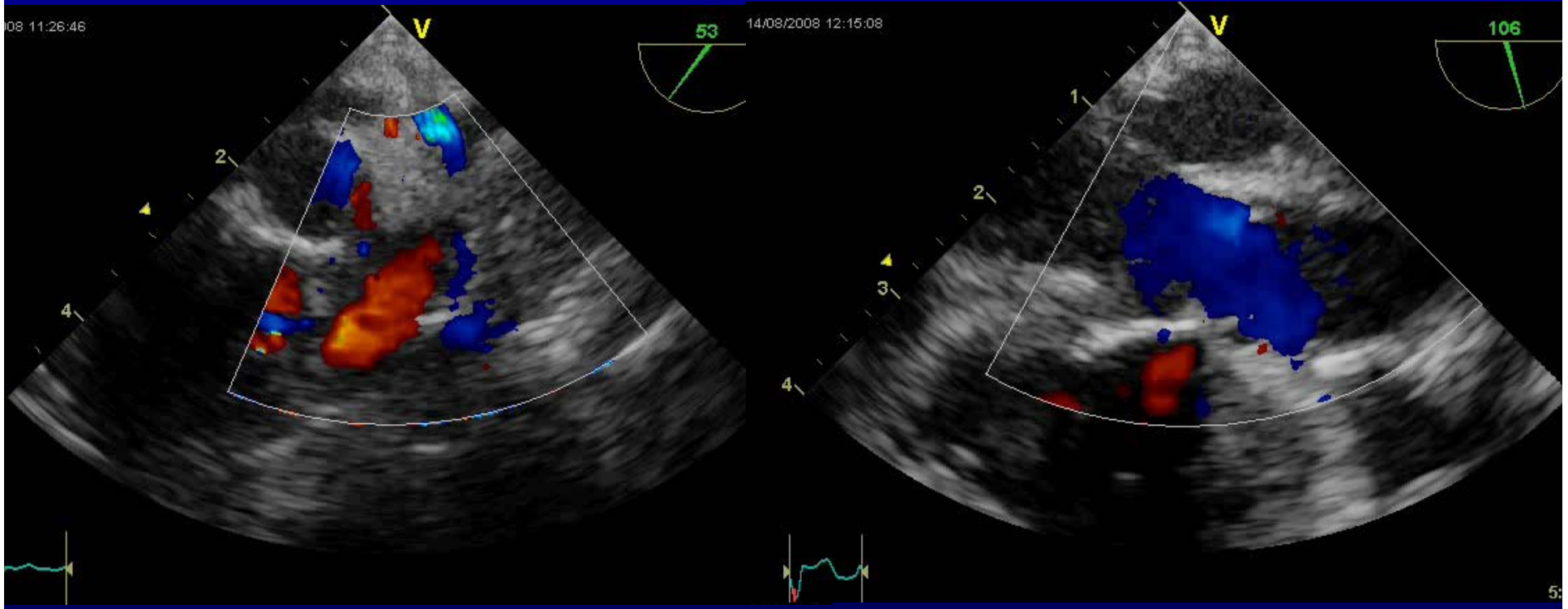


SJM 25 mm mechanical valve

Post-OP: high liver enzymes

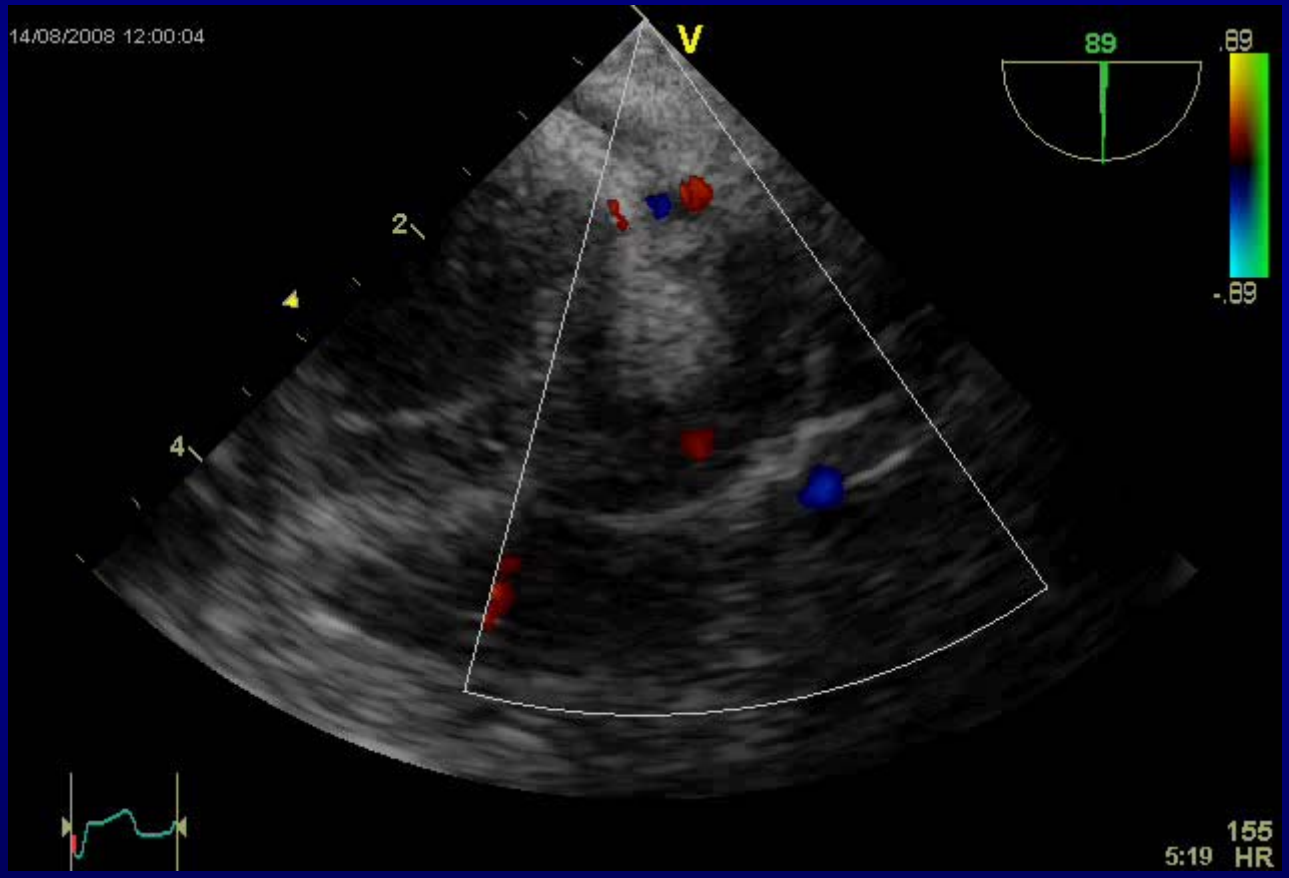


TOF repair



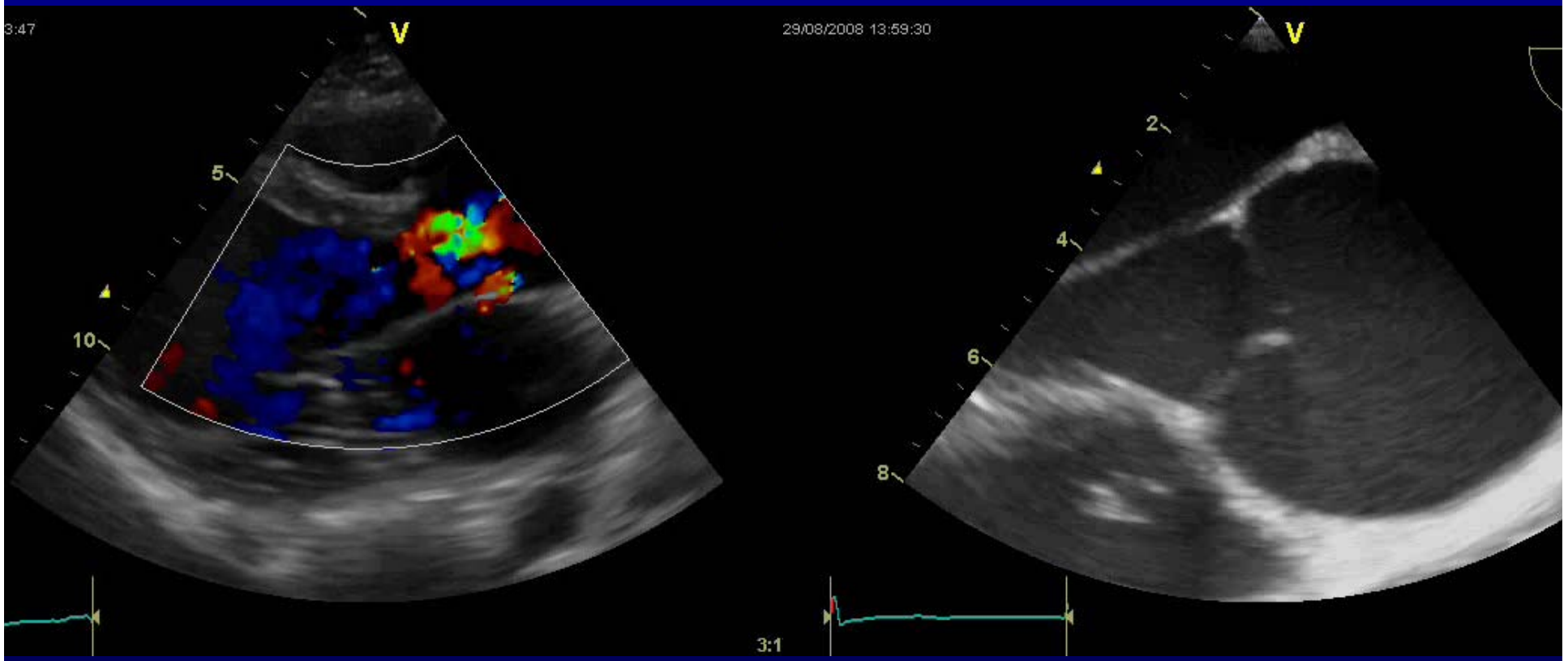
3 months old boy, transatrial resection plus limited TA-patch

TOF repair



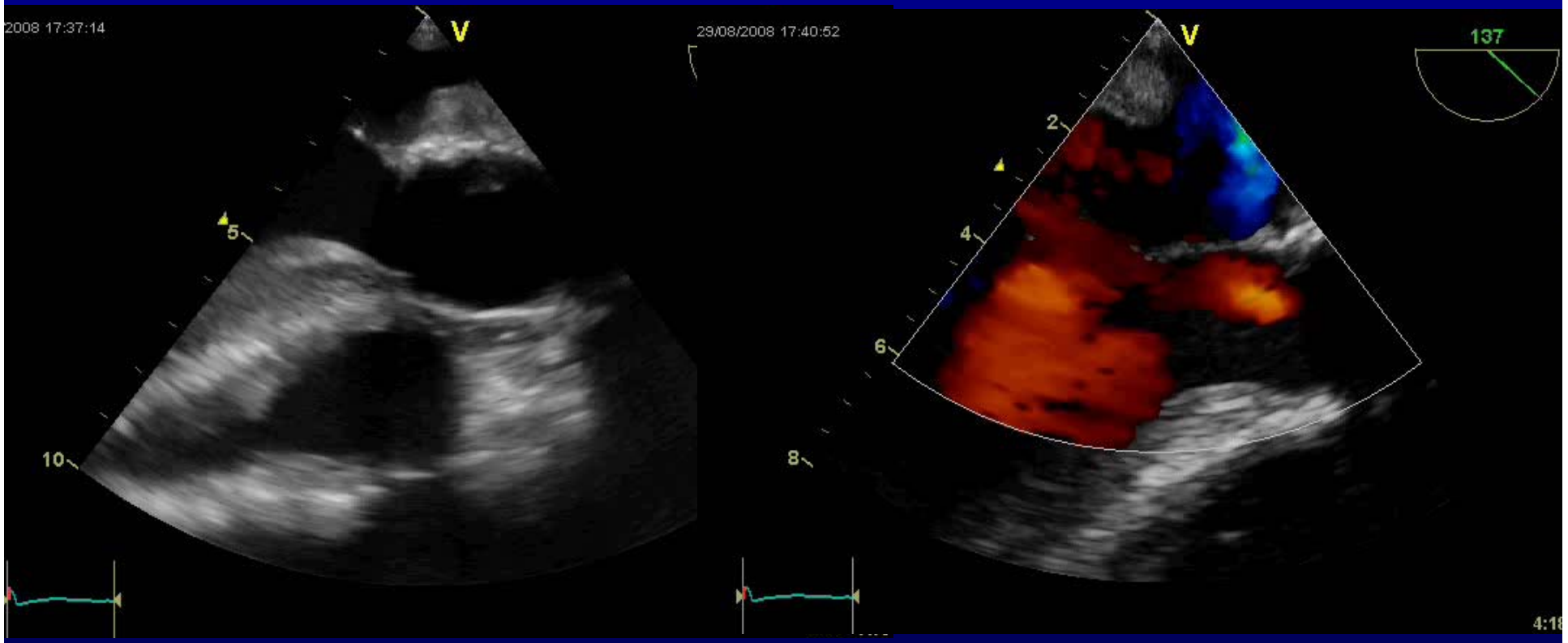
2nd pump run: gradient from 45 -> 30 mm Hg, mild/moderate regurg.

Aortic valve surgery



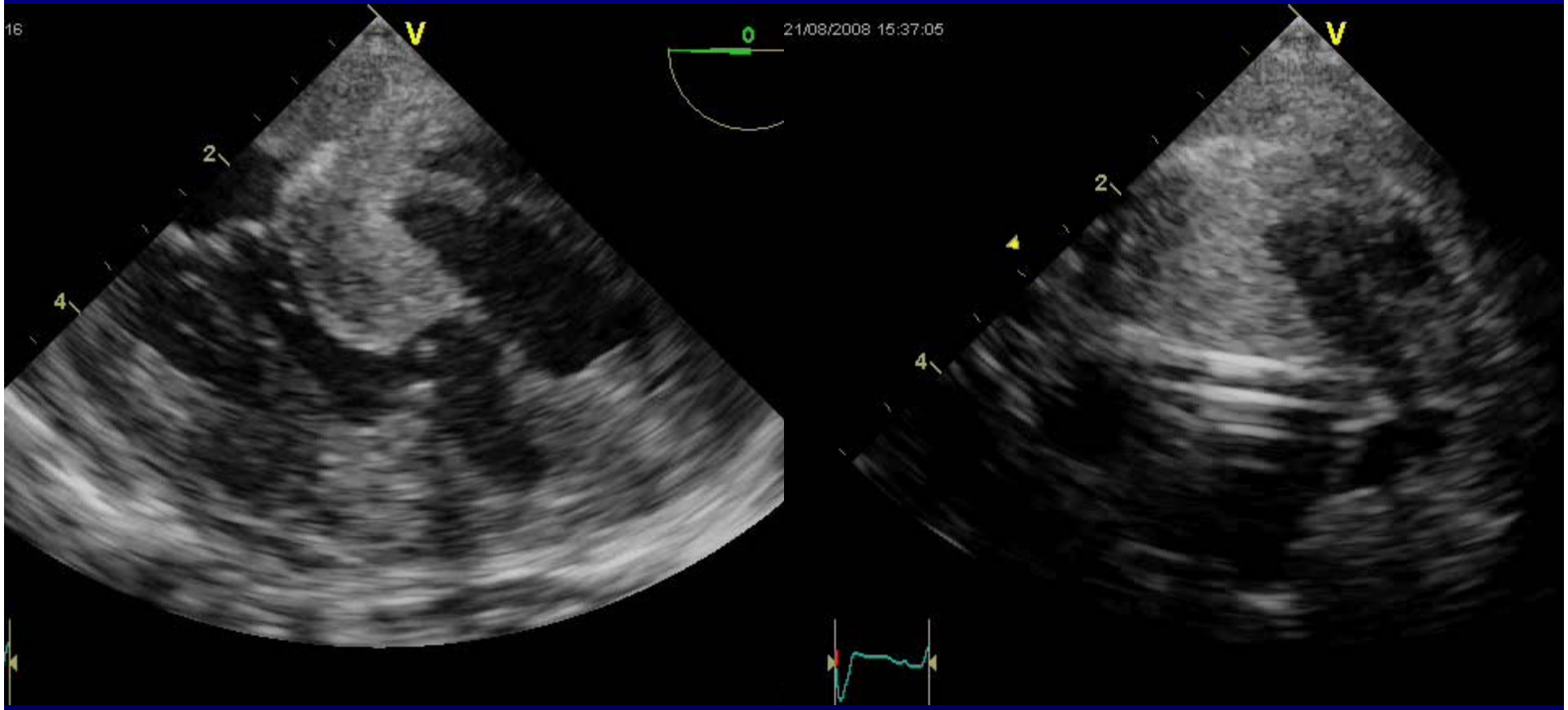
28 y woman Marfan, severe regurgitation, bulbus 55 mm

Aortic valve surgery



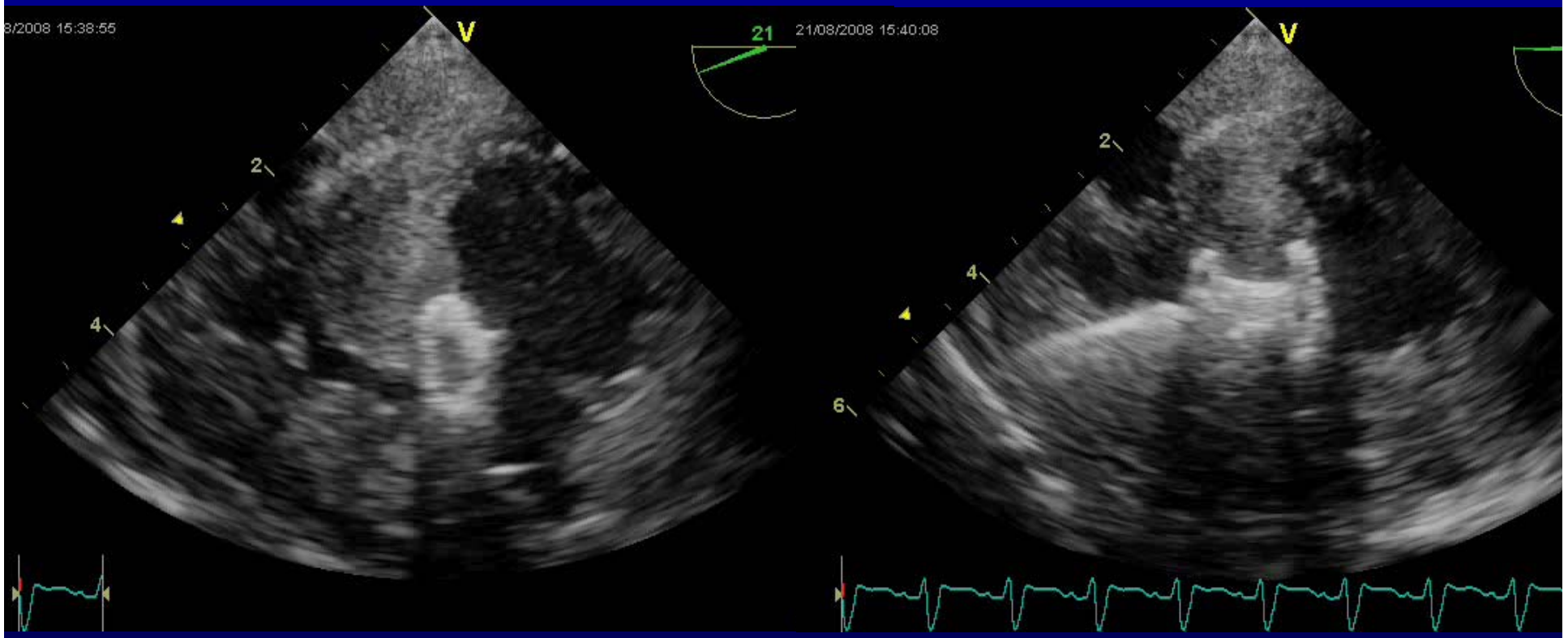
David Operation

Hybrid operation



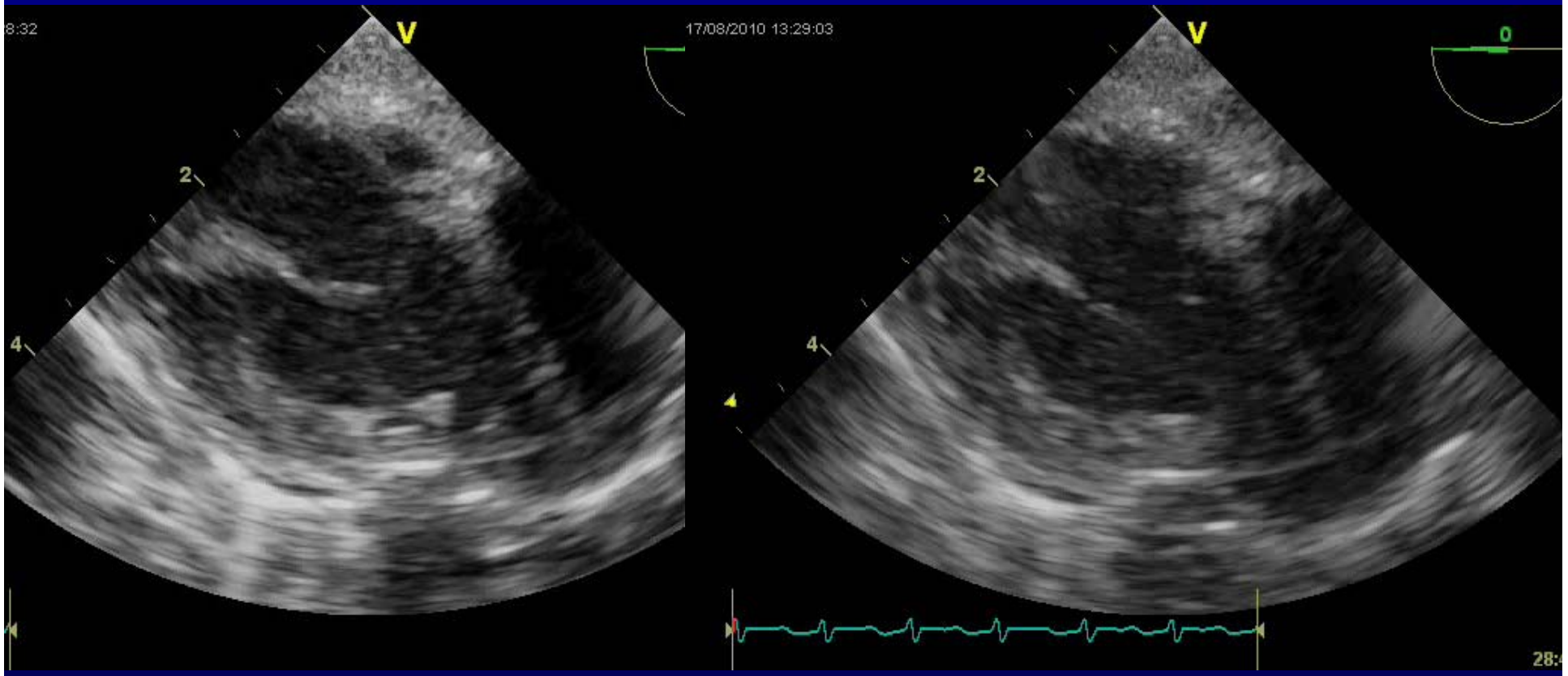
6 months boy, 5 kg, multiple musc VSD´s

Hybrid operation



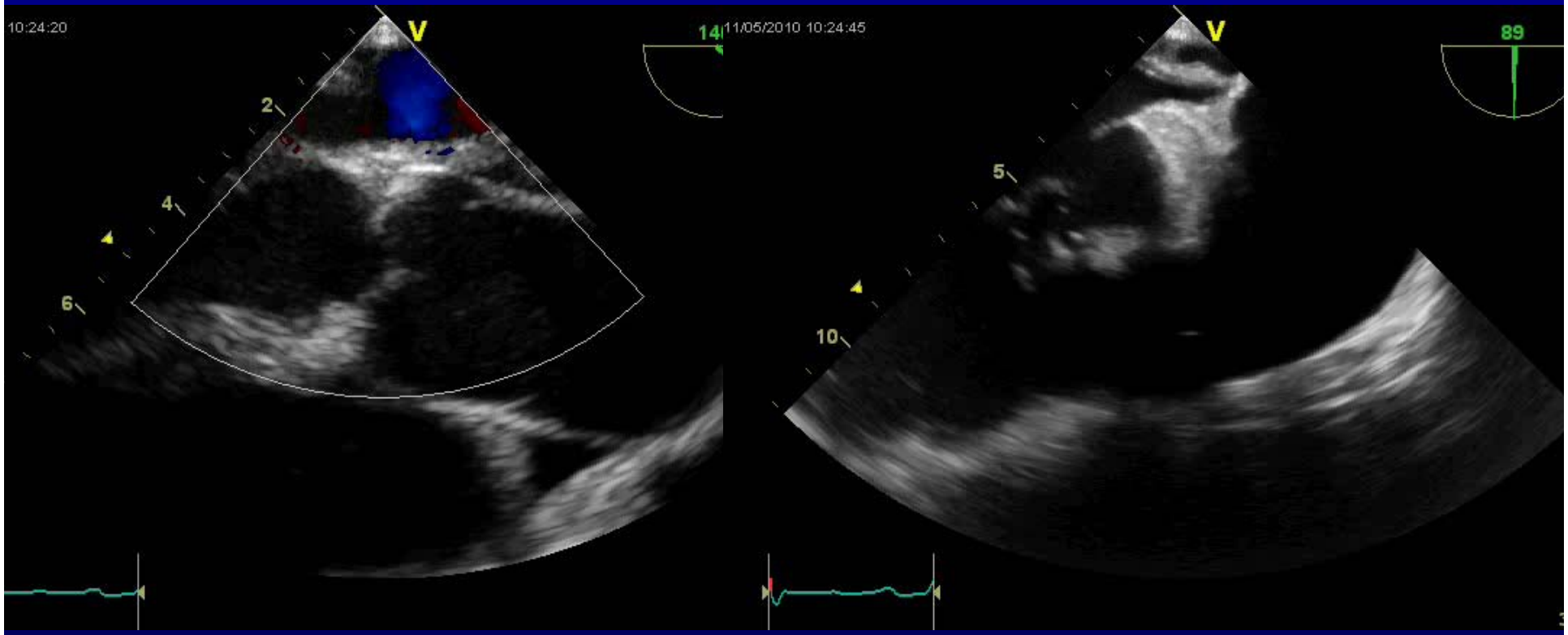
6 months boy, 5 kg, multiple musc VSD´s

Ventricular function - RV



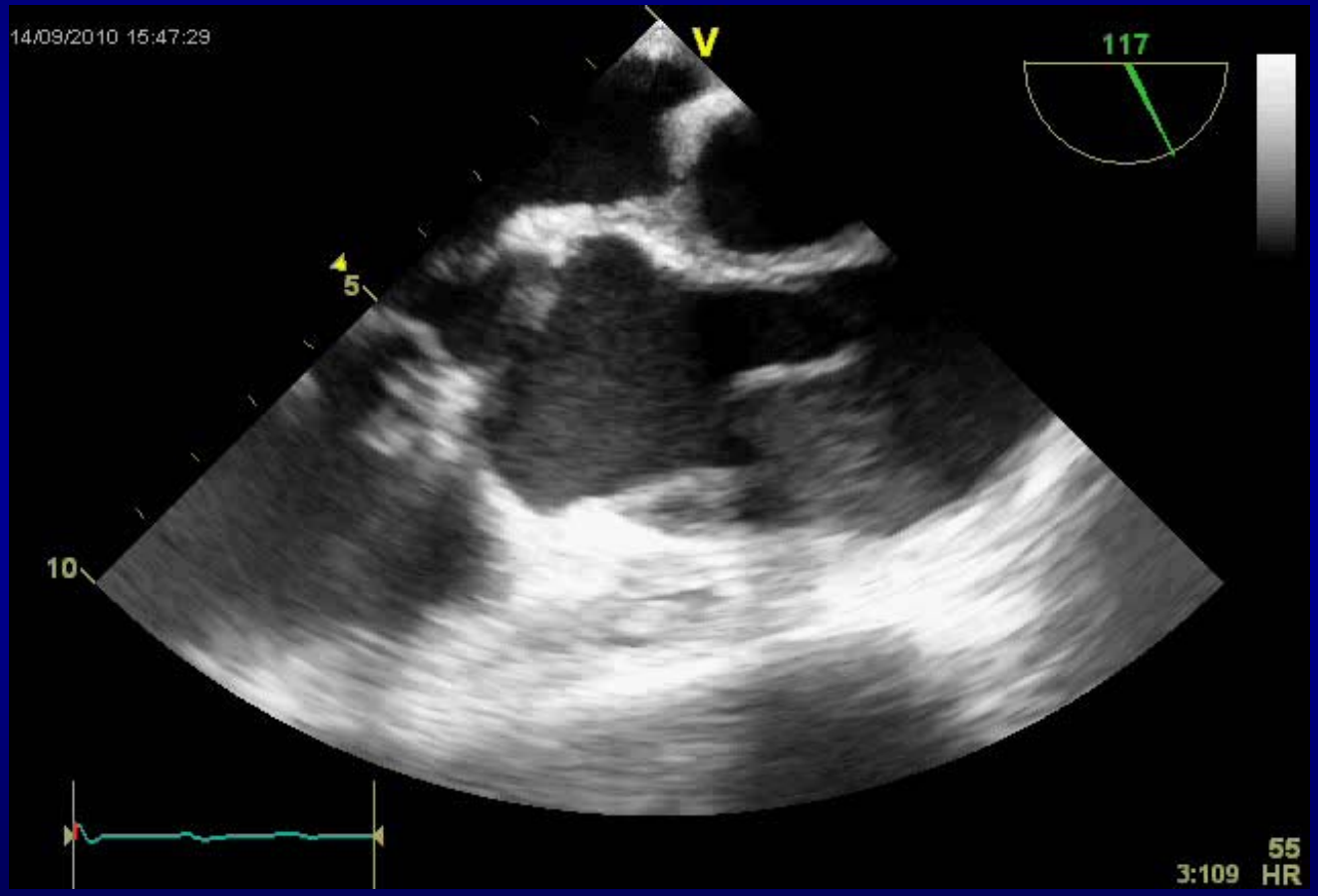
Newborn biventricular repair: before ECMO support

Vascular complication



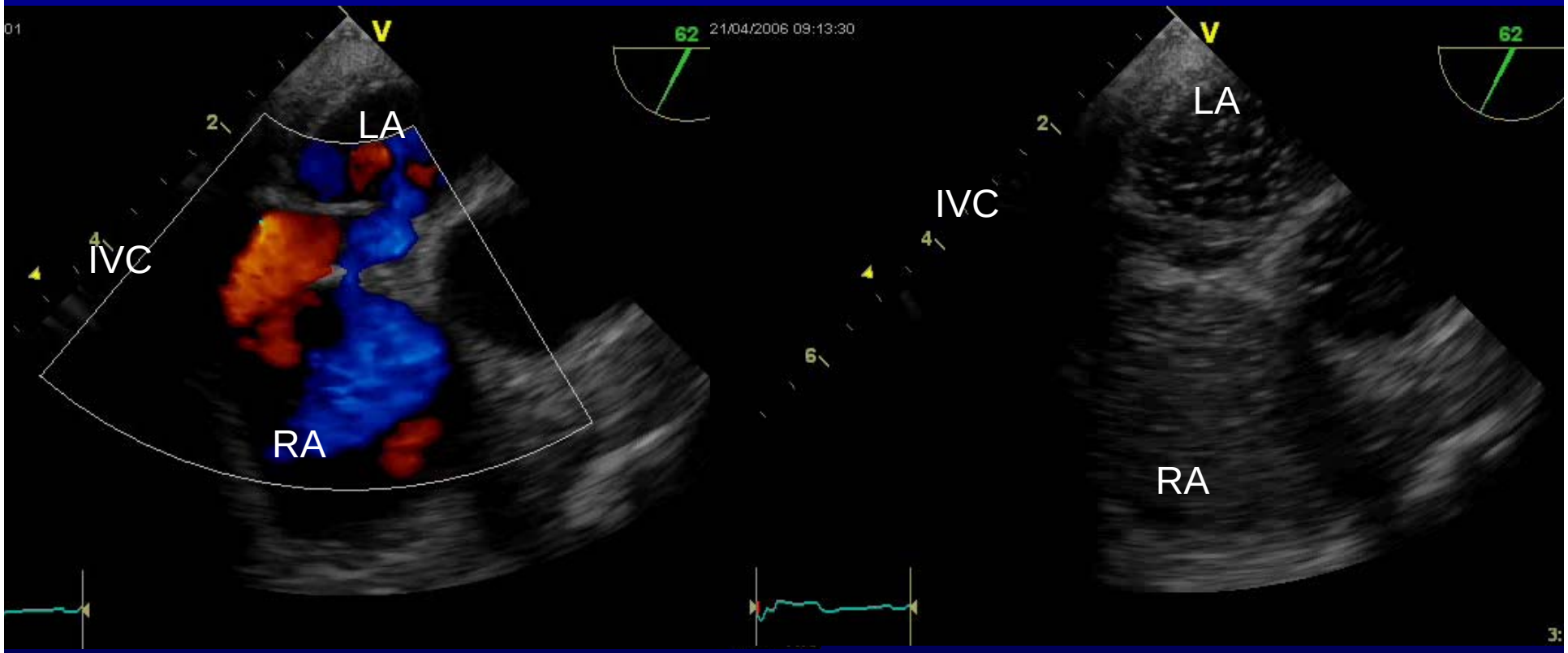
33y Philippine fem, PAVSD: PA - dilatation

Vascular complication



33y fem: 4 days post-OP: Ao dissection Type A

Vascular complications - veins



6y boy: VSD-closure with 5 months, cyanosis under stress

Summary

- iTEE should be done as a routine procedure in every intracardiac repair
- Decision making should be based on a team process (cardiologist - surgeon)
- iTEE is costeffectiv – avoiding reoperations
- Major impact of 10- 15% underlines importance of iTEE
- TEE expertise is necessary in congenital cardiology – at any age

Thanks for your attention!!

See you in Munich 2011