Intraoperative Echocardiography – a new mandatory monitor?

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Intraoperative echocardiography means TOE/TEE

This requires training, accreditation and equipment. Cost implication

Class I recommendation for use TOE limited to cardiac surgery at present other than for haemodynamic instability

Most anaesthetist practicing intraoperative echo accredit with US/GB or EU boards

Answer No!
Possibly

TOE easy to perform, harder to interpret

Answers a lot of questions about haemodynamic instability

New technology and cheaper equipment will make it more widely available

In future maybe all anaesthetic department should have access to machine and TOE accredited anaesthetist
TOE Clinical Cases

Will now go through some of standard TOE views

Clinical cases to illustrate usefulness of TOE

15 spot the diagnosis questions if time
Easy one to start

54 year old male presents with central tearing chest pain radiating into his back!

TOE image of Aortic Arch

What is the diagnosis
AAORTA INTRAMURAL HAEMATOMA
A Large vessel in the body

- What vessel is it?
- What is the abnormality?
DESC AORTA LAX FLAP

St George's Hospital Theatre TOE

ID: 6T

*Cardiac
2:11:34 pm
20-Jul-05

2D
12 cm
9 f/s
f: 2.9 MHz H
DR: 65 dB
R: 0.0 G: 77

CFM
G: 58
f: 4.4 MHz
PRF: 7000Hz
LVR: 2.6cm/s

P: -2dB
Tls: 4.2
MI: 1.3

HR: 196 BPM
1:19:12
Your patient on ITU has a stroke

You do a TOE to exclude cardiac thrombus and aortic atheroma.

When you check the descending aorta you see this image.

Should you call the surgeons urgently?
? Fit for surgery

- 80 yr old male
- Presents with pulmonary oedema
- Echo results
Surgeon refuse patient

Any other options?
58 year old Male on CCU

4 days after posterior/septal Myocardial infarction
Sudden onset SOB, Sats 85% on 4 l/m
On examination – pansystolic murmer, basal creps
Diagnosis and Management

- Pulmonary oedema
- Cardiogenic shock
- Pneumonia
- PE
- Acute VSD
- Papillary muscle rupture
- ABC
- ICU
- Off load
- Inotropes
- CPAP
- Ventilation
Management of acute MR

- Preload ↑↓
- HR ↓ tx AF
- Maintain contractility
- SVR ↓
- PVR ↓

- Repair
- Replace
- Mechanical or Tissue Valve
24 year old student with 2 hours episode of dysarthria

- Previously fit and well
- 1 week history of URTI episode followed bout of coughing
- No history EtOH or Drug abuse
Investigation

- ECG normal
- CT head normal
- Transthoracic echocardiogram normal
- Transoephageal echocardiogram PFO
- Scheduled for Device closure with TOE guidance
Device closure of ASD

Device in place with cable still attached
VSD

- Congenital or Acquired
- Perimembranous, muscular, infundibular
- $L \rightarrow R$ shunt
- Restrictive $\leftrightarrow$ Large (PVR/SVR)
- Pul. HT. if $Q_p/Q_s = 2-4:1$
Assessing Ventricular Function

- Look at contractility wall thickening
- Measure Fraction shortening
- Measure Fractional Area of Contraction
- Stroke volume
- Best view is doughnut view. Transgastric short axis
Normal
Hypokinesis
Akinesis
Dyskinesis
Spot the Diagnosis Test

15 images
Write down diagnosis
Name on the answer sheet + subspecialty
Top score gets prize awarded by Dr Cregg
1. What is the major abnormality?
2. What are the two manmade structures visible in this heart?
3. Which Valve, what is wrong with it?
4. Which valve, mechanical or tissue?
5. View of IVC and RA. What is highlighted by red arrow
6. What is the problem?
7. What are the little white dots?
8. What congenital abnormality is this?
9. What is this?
10. The cardiologist said patient had an 80mmHg gradient across his AV. Intra-operative TOE showed normal AV. What’s going on!
12. 28 year old ODP presents with abdominal distension. What is the diagnosis
13. Patient had thoracic aortic stent two weeks ago. What’s wrong now?
14. Asian patient SOB. Abnormality?
15. Attempt by cardiologist to cross Intraatrial septum with catheter failed. Which vessel did they end up in?
Thank you

Hand paper to person on your right they can mark it. Hand in at end of session

Dr Roman Cregg will announce winner and award prize at end of meeting

Cardiologists and Cardiac anaesthetists automatically disqualified!