CT in Adult with Tetralogy of Fallot

The most common congenital cyanotic heart disease after 1 year of age accounting for 10% of all congenital heart disease

Long term survival in repaired TOF patients
- 74% 10 yr survival
- Approximately 86% survival at 32 yrs
- 10-, 20-, 30- and 36-year survival rates of 97%, 94%, 89% and 85%

Repaired TOF patients need imaging for reintervention or other disease

Outline

• What is TOF
• Associated cardiac anomalies
• Associated coronary anomalies
• Postoperative appearance
• Postoperative Complications
• Re-do- role of CCTA
Tetralogy of Fallot

- Large ventricular septal defect
- Over-riding aorta
- Obstruction of the right ventricular outflow tract
- Right ventricular hypertrophy
Associated Cardiac abnormalities

In 34.8 to 68%

- Coronary artery anomalies- 10-36%
- Right aortic arch- 25%
- ASD- 10- 23%
- Pulmonary artery narrowing or atresia - 13%
- PDA-10%
- Complete AV canal
- Anomalies of systemic venous return
- Valve abnormalities
Coronary artery in TOF

- Anomalous Orifice

- Anomalous Origin

- Anomalous Course

- Anomalous Termination

Pulmonary artery and valve anomalies

- Hypoplasia of the main pulmonic valve

- Main or branch pulmonary artery stenosis- 13%

- Atresia of a pulmonary artery- left 2.8%, right 0.7%

- Aneurysmal dilation of a portion of pulmonary artery- rare

- Right aortic arch-25%

- Postoperative appearance & complications
Indications for Cardiac CTA in adults with TOF

• Preoperative evaluation of previously repaired tet patient
• Assessment of aortopulmonary collaterals
• First assessment as an adult
• Coronary artery disease

CCTA in TOF

Advantages:
• Excellent 3D and multiplanar depiction of anomalies
• 3D anatomic relations of blood vessels and chest wall
• Can provide function, volume and mass
• Obviates need for sedation (may be needed for TEE)
• In postoperative patients- shunt patency, stenosis, fracture, pseudo aneurysm

• Limitations:
  - contrast contraindication
  - Heart rate and rhythm abnormalities
  - Radiation
Technique of CCTA in TOF

- Scan from above PA bifurcation to the diaphragm
- May scan entire thorax if needed
- Increased contrast concentration in saline chaser to visualize the right side
- Retrospective gating- to obtain function information

Redo in TOF

- Most common indication- **long-term complications of the right ventricular outflow tract**: severe pulmonary regurgitation, conduit failure
- Ventricular septal patch leak
- Severe tricuspid regurgitation
- Aortic insufficiency
- Arrhythmias- sustained ventricular tachycardia, supraventricular tachycardia etc
- Aneurysms of the right ventricular outflow tract
- Extracardiac findings
References

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