

## D

### **Damus–Kaye–Stansel Operation**

- Surgical operation performed in TGA, single ventricle, and restrictive VSD causing subaortic stenosis.
- Side-to-side aorta and pulmonary artery connection to provide unrestricted blood flow from the systemic ventricle to the aorta.

### **D-Dimers**

- High negative predictive value for PE and DVT.
- Positive D-dimer results with medium–high clinical probability of PE should be followed by CTA.

### **Dextrocardia**

- Anomalous cardiac position with the apex pointing the right chest wall.
- Cardiac anatomy may be normal.

- Check for other congenital cardiac lesions.
- *Differential diagnosis*: in case of abnormal heart position, look for congenital absence of pericardium.

## **Diastolic Dysfunction**

- See section “[Heart failure](#)”.

## **Diastolic Tail**

- See section “[Aortic coarctation](#)”.

## **DiGeorge Syndrome**

- Genetic disease on chromosome 22 leading to thymic hypoplasia with low T cell count, hypoparathyroidism with hypocalcemia, and outflow tract defects of the heart (ToF, truncus arteriosus, interrupted aortic arch, right-sided aortic arch, aberrant right subclavian artery).

## **Dilated Cardiomyopathy**

- Impaired systolic function with dilatation of cardiac chambers.
- Diastolic function can be normal or impaired.
- Causes: inherited (25 %), myocarditis, metabolic, nutritional, and persistent tachycardia. Usually diagnosis of exclusion.

- *Differential diagnosis*: ischemic heart disease, valvular disease, adult congenital heart disease, left ventricular noncompaction, iron-overloaded cardiomyopathy, alcoholic cardiomyopathy, hypertensive heart disease.
- See also section “[Cardiomyopathies](#)”.

## Dipyridamole

- Indirect vasodilator agent used in stress MR.
- Increase endogenous levels of adenosine blocking cellular uptake.
- Dipyridamole dose: 0.56 mg/kg IV over 4 min.
- Prolonged action (~30 min).
- Low-dose protocol: infusion of a total dose of 0.56 mg/kg dipyridamole in 4 min, with imaging started immediately after completion of the 4 min infusion.
- High-dose protocol: adds a second injection of 0.28 mg/kg dipyridamole for 2-min duration, with imaging initiated at 8 min after the beginning of the first injection (a total dose of 0.84 mg/kg dipyridamole is injected in the high-dose dipyridamole infusion protocol).
- Patients should avoid methylxanthine-containing products for 24 h prior the scan.
- Contraindications: (1) high-grade AV block; (2) asthma or COPD; (3) sinus bradycardia; (4) systemic hypotension (BP <90 mmHg); (5) severe carotid stenosis.
- Side effects: transient heart block, transient hypotension, transient tachycardia, bronchospasm.
- Antagonist: aminophylline, 50–100 mg over 1 min, injection can be repeated up to 250 mg total dose.
- See also section “[Perfusion imaging, myocardial](#)”.

## Dobutamine

- Positive inotropic agent used in stress MR.
- Increases heart rate and myocardial contractility.
- High-dose protocol: IV dobutamine infusion at 3 min stages (10, 20, 30, 40  $\mu\text{g}/\text{kg}/\text{min}$ ).
- Target heart rate:  $(220 \text{ age}) \times 0.85$ . If not reached at 40  $\mu\text{g}/\text{kg}/\text{min}$ , atropine in 0.25 mg fraction (2 mg max.) if heart rate response is poor.
- Low-dose protocol: 5–10  $\mu\text{g}/\text{kg}/\text{min}$ .
- Contraindications: (1) severe hypertension ( $>220/120 \text{ mmHg}$ ); (2) congestive heart failure; (3) unstable angina (4) aortic valve stenosis (peak gradient  $>50 \text{ mmHg}$ ); (5) HCM; (6) complex arrhythmias; (7) myocarditis; (8) pericarditis.
- See also section “[Perfusion imaging, myocardial](#)”.

## Dominance, Coronary

- Coronary artery dominance refers to which artery supplies the posterior part of the heart.
- In 85–90 % is the right coronary artery (right dominance).
- In 8–10 % is the circumflex artery (left dominance).
- In 5 % the inferior wall is vascularized both from RCA and Cx (codominant or balanced circulation).

## Dose Length Product

- DLP:  $\text{CTDI}_{\text{vol}} \times \text{scan length}$ .
- It is an indicator of total exposure for a complete CT scan, which allows us to compare the dose with several adjustments of technical parameters in order to optimize patient protection.

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## Double Outlet Right Ventricle

- >50 % of great vessels arise from the right ventricle.
- Large subaortic VSD.
- Wide abnormalities spectrum: from Fallot type to transposition of the great arteries.
- Can be associated with RVTO stenosis.
- *MR*: (1) vascular connection, (2) ventricular volumes and function, (3) RVTO stenosis, (4) shunts.

## Dressler Syndrome

- A myocardial infarction-associated pericarditis with delayed onset typically 1 week after infarction to several months.
- Suspected autoimmune etiology.

## Ductus Arteriosus or Ductus Botalli

- A fetal blood vessel connecting the pulmonary artery to the aortic arch.
- Fibrosis and closure at birth (ligamentum arteriosum).

## Ductus Arteriosus, Persistent

- Left-to-right extracardiac shunt caused by patent ductus arteriosus.
- *MR*: (1) shunt detection; (2) quantification of shunt degree.

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## Dyslipidemia

- Primary hyperlipidemias: (1) familial hyperchylomicronemia; (2) familial hypercholesterolemia; (3) familial defective apoprotein B-100; (4) polygenic hypercholesterolemia; (5) familial combined hyperlipidemia; (6) dysbetalipoproteinemia; (7) familial hypertriglyceridemia; (8) type V hyperlipoproteinemia.
- Secondary hyperlipidemias: (1) renal failure; (2) nephrotic syndrome; (3) hypothyroidism; (4) type II diabetes and obesity; (5) alcohol abuse; (6) cholestasis; (7) drugs.
- Normal range for plasma lipid levels: (1) total cholesterol, 150–250 mg/dL; (2) LDL cholesterol, <160 mg/dL; (3) HDL cholesterol, 30–75 mg/dL; (4) triglycerides, 70–175 mg/dL.

## Dyssynchrony, Cardiac

- Three types: (1) atrioventricular (PR > 120 ms); (2) interventricular (delay between RV and LV contraction); (3) intraventricular (differences in regional wall motion).

## Dystrophies, Muscular

- Hereditary muscle disease causing progressive severe skeletal muscle weakness, which can lead to dilated cardiomyopathy.
- Most common: Duchenne, Becker, limb girdle muscular dystrophies.
- *MR*: (1) left ventricle dysfunction; (2) myocardial edema and inflammation; (3) late enhancement similar to myocarditis.

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## Suggested Reading

- Khoo JP et al (2012) Stress cardiovascular MR in routine clinical practice: referral patterns, accuracy, tolerance, safety and incidental findings. *Br J Radiol* 85:e851–e857
- Mavrogeni S et al (2013) CMR detects subclinical cardiomyopathy in mother-carriers of duchenne and becker muscular dystrophy. *JACC Cardiovasc Imaging* 6:526–528
- Quarta G et al (2011) Cardiomyopathies: focus on cardiovascular magnetic resonance. *Br J Radiol* 84:S296–S305
- Warnes CA et al (2008) ACC/AHA 2008 guidelines for the management of adults with congenital heart disease. *Circulation* 118:e714–e833