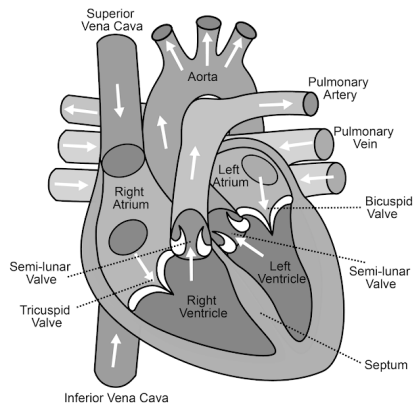


The Human Heart



Risk Factors

- Cardiac development occurs very early in fetal life
- maternal factors (rubella, alcohol, diabetes mellitus)
- Genetic factors (history of congenital heart disease)
- Trisomy 21 (Down syndrome)
- Presence of other congenital anomalies or syndrome.

Atrial septal defect (Acyanotic)

Opening in the atrial septum permitting free communication of blood between the 2 atria

Ostium primum (ASD1) open at lower end of septum

Ostium secundum (ASD2) open near the center septum

Pathophysiology

Atrial septal defect (Acyanotic) (cont)

- Blood flows from left to right (oxy to deoxy) because of the stronger contraction of the left side of the heart, causing an increase volume in the right.
- Right atrium enlarged, ventricular hypertrophy and increased pulmonary artery blood flow.

Signs and symptoms

- Dyspnea on exertion, fatigability, mild growth failure
- Cyanosis does not occur unless CHF is present.

Diagnosis

- ECG with color flow doppler reveal enlarged right side of the heart
- Cardiac catheterization reveal separation in atrial septum

Treatments

- Surgical or catheterization laboratory for ASD2
- Surgery : sutured, completed with catheterization
- Cardiopulmonary bypass : open heart surgery
- Silastic or Dacron patch : sutured in place

Complications

- Infectious endocarditis and eventual heart failure
- can cause emboli during pregnancy if not treated

Aortic Stenosis (Acyanotic)

Narrowing at above or below the aortic valve.

Supravalvular ascending aorta. least common

Valvular most common

Subvalvular subaortic. left outflow tract.

Signs & Symptoms

- Mild: exercise intolerance, easy fatigability, asymp.
- Moderate: Chest pain, dyspnea, dizziness & syncope
- Severe: weak pulses, left failure, hypotension, tachy and activity intolerance chest pain and sudden death.

Treatment

- Balloon valvuloplasty as the standard treatment
- Mild: activity should not be restricted
- Mod-severe: no competitive sports
- Cardiac catheterization: Balloon dilation
- Surgical valvotomy: if closed procedure doesn't work. done to older pts. when severe calcium deposits further obstruct the valve.
- Beta blocker or calcium channel blocker
- Antibiotic prophylaxis against endocarditis

C

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Acyanotic (Congenital heart defect)

Increased pulmonary blood flow

- Atrial septal defect
- Ventricular septal defect
- Patent ductus arteriosus
- Atrioventricular canal

Obstruction to blood flow from ventricles

- Coarction of the aorta
- Aortic stenosis
- Pulmonic stenosis

Diagnostic Tests

Echocardiogram	Cardiac Catheterization
Electrocardiogram	Chest X-ray
Echocardiography	MRI

Ventricular Septal Defect (Acyanotic)

Abnormal opening in ventricular septum, allows free communication between R & L ventricles

Small to moderate VSD: 3-6 mm, asymptomatic

Moderate to large VSD: symptomatic, require repair

Signs & Symptoms 4-8 weeks

- Easy fatigue, failure to thrive, dyspnea
- A loud, harsh murmur on left sternal border (3rd/4th)
- Thrill may be palpable, respiratory infections

Treatment

- Small VSD: no surgical intervention, just reassurance

Ventricular Septal Defect (Acyanotic) (cont)

• Symptomatic VSD: meds, afterload reducers, diuretics

• Moderate: cardiac catheterization

• Larger: 3mm open heart surgery

• Exceptionally large: Silastic or Dacron patch

Complications

- Cardiac or Heart failure
- Endocarditis due to recirculating blood flow

Indication for surgery: Large vsd with uncontrolled symptomatology, Ages 6-12 mo. with large vsd & pulmonary HTN

Pulmonary Stenosis (Acyanotic)

Narrowing of the pulmonary valve or PA that results in the obstruction of blood flow from the ventricles.

Signs & Symptoms

- Mild : Asymptomatic, split 2nd heart sound w/ delay
- Heart failure (right) & cyanosis with severe
- Systolic ejection murmur, Right ventricular enlargement
- Exercise intolerance

Treatment

- Mild: No intervention needed, close follow up
- Mid-severe: requires relieve of stenosis
- Balloon valvuloplasty, treatment of choice
- Surgical valvotomy is also a consideration.
- Open-heart needed only for more complex valve anomaly.

Cyanotic (Congenital heart defect)

Decreased pulmonary blood flow

- Tetralogy of Fallot
- Tricuspid atresia

Mixed blood flow

- Transposition of great vessels
- Truncus arteriosus
- Total anomalous pulmonary venous return
- Hypoplastic left heart syndrome

Atrioventricular Septal Defects (Acyanotic)

• Also called an **endocardial cushion defect**, results from incomplete fusion of the endocardial cushion. At the septum of the heart

• Consists of a low atrial septal defect continuous with ventricular septal defect & clefts of mitral & tricuspid, creating a large central AV valve

- Allows blood to flow between all heart chambers.

Signs and Symptoms

- CHF in infancy, Failure to thrive, recurrent infections
- Exercise intolerance, easy fatigability
- Cardiac enlargement on CX-ray

• Late cyanosis from pulmonary vascular w/ R to L shunt

Treatment

- Surgery is always required
- Treatment of congestive symptoms.
- Pulmonary banding maybe req. in premature or <5kg



Patent Ductus Arteriosus (Acyanotic)

Conduit between pulmonary artery & aorta fails to close and results in increased pul. blood flow (L to R shunt)

Ductus Arteriosus fetal structure that connects PA to the aorta. Closure at first breath and is incomplete bet. 7 to 14 days. closure not until 3 mos.

- blood will shunt from aorta (oxy) to the PA (deoxy) because of the increased pressure in the aorta.

Signs & Symptoms

- Small PDA: usually asymptomatic
- Large PDA: symptoms of CHF & growth restriction
- Bounding arterial pulses, Widened pulse pressure
- Enlarged heart, prominent apical impulse.
- Classic continuous machinery systolic murmur
- Mild-diastolic murmur at the apex.

Treatment

- Indomethacin, inhibitor of prostaglandin synthesis
- Surgical or catheter closure.

Same complications

Coarction of the Aorta (Acyanotic)

Narrowing of aorta due to a constricting band

Signs & Symptoms

- Diminution or absence of femoral pulses
- Higher BP in upper extremities, headache, vertigo
- Weak lower extremity pulses. decrease cardiac output
- Epistaxis & CVA not in children due to elevated BP
- Leg pain due to diminished blood supply

Treatments

- Surgical intervention, prevent left vent dysfunction
- Angoplasty is used by some centers
- Balloon angioplasty is the procedure of choice
- Antihypertensive - High BP post-op
- Antibiotic as prophylactic



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