Atrial Septal Defects

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ASD Fun Facts

- Accounts for 5-10% of congenital heart defects (6-8:1000 live births)

- Symptoms not often seen in infancy or early childhood

- Often not correctly identified until later in life
Cardiac Looping
Atrial Septation
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- Superior vena cava
- Septum secundum
- Right atrium
- Septum primum
- Left atrium
- Foramen secundum
- Foramen ovale
- Muscular ventricular septum
- Sectioned atrioventricular septum
- Right ventricle
- Inferior vena cava

Blood flow

Early 7th week (43 days)
Three Common Types of ASD

Ostium Secundum Atrial Septal Defect

Ostium Primum Atrial Septal Defect

Sinus Venosus Atrial Septal Defect
Ostium Secundum Atrial Septal Defect
Ostium Primum Atrial Septal Defect
Sinus Venosus Atrial Septal Defect
Case Study

- 6 year old girl
- Cardiac murmur detected at 4 years of age
- Growth and development slightly retarded
- Some limitation of exercise tolerance
- No cyanosis or clubbing
- Increase in the number of respiratory infections between the ages of 4 and 6 years
Physical Examination

- Slight asymmetry of the thorax
- Prominence of the precordium
- Heart not markedly enlarged
- No palpable thrills
- Systolic murmur audible along left sternal border
  - Max. intensity heard in the 2nd left intercostal space
Sounds of the Heart

Sounds of aortic semilunar valve are heard in 2nd intercostal space at right sternal margin.

Sounds of pulmonary semilunar valve are heard in 2nd intercostal space at left sternal margin.

Sounds of mitral valve are heard over heart apex, in 5th intercostal space in line with middle of clavicle.

Sounds of tricuspid valve are typically heard in right sternal margin of 5th intercostal space; variations include over sternum or over left sternal margin in 5th intercostal space.
Physical Examination

- Electrocardiogram showed right axis deviation and incomplete right bundle branch block
- Cardiac catheterization verified the diagnosis
  - Information about size and location of defect
- Fluoroscopic exam
  - Dilation of right heart and pulmonary arteries
  - Pulsation of pulmonary artery branches
  - Increased vascularity of the lung fields
Diagnosis

Atrial septal defect – ostium secundum type
Causes of Atrial Septal Defects

- **Unclear**
  - Chance 2:1 prevalence in female vs. male
  - Rubella (German measles)
  - Diabetes
  - Medications
    - Isotretinoin (accutane)
    - Lithium (eskalith) Alcohol
  - Heredity
    - Appear to run in families
    - 1/3 children with Trisomy 21 also have a heart defect
Symptoms

- Fatigue
- Sweating
- Rapid or difficulty breathing
- Shortness of breath
- Tiring easily when playing
- Poor growth
- Frequent respiratory infections

*Often resemble other conditions or medical problems*
Diagnostic Tests - Echocardiogram

Images from http://www.kumc.edu/kumcpeds/cardiology/asddfct.html
Other Diagnostic Tests –

- Chest X-Ray
- Electrocardiogram (ECG)
- Cardiac Catheterization
- MRI
Other Problems Associated with ASD

- Right atrial and ventricular enlargement
- Tricuspid regurgitation
- Pulmonary hypertension
- Rhythm disturbances
- Stroke
Treatment

- Recommended that the ASD is treated during childhood
- Treatment of ASD depends on severity of the defect on the heart
- Four treatment options
  - Observation and Monitoring
    - Holter Monitor
  - Medical Management
  - Surgery
  - Non-surgical closure (new)
Holter Monitor

Non-surgical Closure - Occluder

Questions?
Sources

- Dr. Brauer’s class notes.