ATRIAL SEPTAL DEFECT

Isolated (valve-incompetent) patent foramen ovale (PFO) is a common echocardiographic finding during infancy but usually it is of no hemodynamic significance and **not considered an ASD**.

ASD can be divided into 3 types; primum, secundum, & sinus venosus. **ASD Secundum (Ostium Secundum Defect)** It is the **most common** form of ASD & constitutes ≈ **7% of all CHD**,

Female>Male, it located in the region of fossa ovalis. The majority of cases are **sporadic**; AD inheritance occurs as part of the

Holt-Oram syndrome or in **families** which may be associated with heart block. **Path.** The **degree of Lt to Rt shunt** is depend on; size of the defect, relative compliance of the right and left ventricles, and the relative

vascular resistance in the pulmonary and systemic circulations. The **paucity of symptoms in infants** is related to the **structure of the**

right ventricle in early life when its muscular wall is thick and less

compliant, thus **limiting** the left-to-right shunt, but as the infant becomes older and pulmonary vascular resistance (PVR) drops, the large blood flow through the right side of heart results in enlargement of the right atrium and ventricle with dilatation of the pulmonary artery. Despite the large pulmonary blood flow, pulmonary arterial pressure is usually **normal** throughout childhood because of the **absence** of a high-

pressure communication between the pulmonary and systemic

circulations. **C.M.**

Hx. Most children with ASD secundum is **asymptomatic** & discovered

accidentally, even an extremely large defect **rarely** produces clinically evident HF in childhood; however, younger children may have **subtle**

FTT & older children may have **exercise intolerance**.

Platypnea (dyspnea on standing, relieved when supine) and

orthodeoxia (desaturation on standing, relieved when supine) may occur when right to left shunting occurs through on ASD.

Ex. Mild left precordial **bulge**, **loud** 1st heart sound; the 2nd heart sound is characterized by **wide fixed splitting** in all phases of respiration (sometimes with pulmonic ejection click); the **systolic ejection murmur**

(usually without thrill) is produced by the **increased flow across the**

right ventricular outflow tract into the pulmonary artery (i.e. **not** by

the low-pressure flow across the ASD); it is best heard at the left middle

and upper sternal border. **Mid-diastolic murmur** produced by the increased blood flow across the

tricuspid valve is usually indicate **Qp : Qs ratio** is at least 2:1. **Inv.** **CXR;** mild cardiomegaly with ↑ pulmonary vascularity. **ECG;** right ventricle volume overload & QRS axis may be normal or exhibit right axis deviation. **Echo & Doppler** studies are diagnostics. Catheterization is also diagnostic but usually not required. **Cx.** Secundum ASDs are well tolerated during childhood, and symptoms

do **not usually appear until the 3rd decade & later** or during the increased volume load of **pregnancy**; these Cxs include: pulmonary hypertension, atrial dysrhythmias, tricuspid or mitral insufficiency, & HF. ***Note:*** *Infective endocarditis is* ***very rare****, thus antibiotic Px* ***usually not*** *required*

in ASD secundum. **Rx.** Small ASD secundum with minimal shunt usually **not require Rx**;

however, **transcatheter or surgical device closure** is advised for all

symptomatic patients or the Qp : Qs ratio at least 2:1 (even if patient is

asymptomatic). **Pg.** ASD secundum in **term** infants may become smaller or close spontaneously. **ASD (Ostium) Primum** It is situated in the **lower** portion of the atrial septum and overlies the

mitral and tricuspid valves which are often abnormal resulting in **insufficiency** (especially the mitral). In **AV Canal (Septal, Endocardial Cushion) defect**, ASD is contiguous (continuous) with **VSD** & associated with markedly **abnormal AV valves**.

In **complete** form of AV Canal defect, a **single AV valve** is common to

both ventricles. This lesion is common in patients with **Down syndrome**.

Path. ASD Primum is basically **similar** to ASD Secundum **combined** with valvular insufficiency. In AV septal defects, the left-to-right shunt occurs at **both** the atrial and ventricular levels as well as additional shunting may occur **directly** from the left ventricle to the right atrium (due to

absence of the AV septum). **Pulmonary hypertension** and the tendency to ↑ PVR may occur as early as **6-12 mo** of age which eventually → Eisenmenger physiology. **C.M.** ASD **Primum** symptoms may be **similar** to those of ASD **Secundum**,

whereas **AV Canal** defect symptoms may be **similar** to those of **VSD** &

usually appear in early infancy e.g. HF, rcurrent RTI, & FTT. ASD Primum may produce harsh **apical holosystolic murmur** due to mitral insufficiency; manifestations of HF may also present. **Inv.** **CXR;** cardiomegaly with ↑ pulmonary vascularity. **ECG;** there are many charecteristic changes in complete AV Canal defect *(see the text)*.

 Echo; diagnostic & may show a "gooseneck" deformity of the left ventricular outflow tract. **Doppler** (pulsed & color flow) study; show quantity & direction of the shunt. Catheterization & angiocardiography is rarely required. **Rx. Early surgery. Pg.** Most patients with ASD Primum (like Secundum) may **not** be symptomatic until 3rd decade or later!, whereas patients with complete

AV Canal defect may **die in early infancy** (due to HF) if they not operated early

. **Sinus Venosus ASD**

It is situated in the **upper part** of the atrial septum close to the entry of **superior vena cava** where one or more pulmonary veins (usually from the right lung) drain anomalously into this defect, therefore it is part of **Partial Anomalous Pulmonary Venous Return (PAPVR)**.

All other features are **similar** to those of ASD Secundum.