

Subject: cyanotic heart disease

Cong. H.D. & Family Hx \rightarrow incidence \uparrow pregnancy \rightarrow incidence \uparrow (circled)

① most cong. H.D inheritance is multifactorial

② not specific gene unless ass. with syndrome.

- Pre natal Dx \rightarrow fetal tachycardia >120 \rightarrow \uparrow risk of arrhythmia

\rightarrow structural defect

\rightarrow small size of Lt. vent.

[aortic valve problem.
mitral valve problem.

- Murmur as incidental finding

\rightarrow suggestive for cong. H.D.

Critical lesions \rightarrow early in life, usually first week

b/c Ductal dependent lesions

P.S. Ductus Arteriosus = connection btw pulm. A & thoracic aorta.

① closes after delivery

② lesion in left side of heart (obstruction), coarctation A.

, aortic stenosis \rightarrow depends on duct to be opened

to live (flow from Rt \rightarrow Lt) if this duct closes

* there is obstruction \rightarrow no B. flow to body.

③ So symptoms of H. failure v. early (1st week) \rightarrow think of

(ductal dependent) DD lesion

▶ Subject :

⊗ Some Ptn come with late H. failure (2nd month) →
think of (LT to RT shunt)

⊗ LT to RT shunt → ↑ Flow in RT side → ↑ Flow to Pulmonary circulation
→ ↑ Flow on Lungs.

LT to RT shunt → after 1 month. due to increased flow to Pulm. circulation

why not early on → b/c after delivery pr on the right side
is high > Lt side Pressure,
with growing → pr on the rt side decreases
& systemic vascular resistance ↑ → pr on Lt ↑↑
So flow from Lt to Rt.

C/P → symptoms of H. failure

tachypnea, tachycardia, murmur

⊗ Ductal dependent lesions → (Lt side LES)

Lt side obstruction → COA, AS, TS

DD lesion means when ductus Arteriosus close → symptoms appear.

Subject:

Pic 6 → Deoxygenated Blood from systemic circulation sent 70%

↓

RT atrium → RT ventricle → pulm. circulation

oxygenated Blood from lungs to Lt Atrium → Lt vent

↓

circulation

④ most common presentation of H. failure in peds is

- Poor feeding →

sweating in forehead during feed, irritability, weight gain.

- FTI → b/c higher demands ↑

- Gallop rhythm = S₁ S₂ S₃

⑤ when Lt sided H.f → backflow to lungs

↓

tachypnea, Rales & cough ...

⑥ with Rt sided H.f → systematic symptoms →

hypertrochally

peripheral edema

Neck vein distention Y84

P.S peripheral = dependent → supine position → saeral → Lt edema.

most definitive cardiac test = Echo cardiogram.

Subject:

hyperoxia test → its historical (sad face) due to echo ✓

Cong. H.D cyanosis (Pneumonia, asthma) lung dis.

(Pneumonia, asthma) lung dis.

! Salivations

Resp < 7250 (mmHg) < arterial PO₂ arterial PO₂ < 100 (mmHg)

Cong. H.D arterial PO₂ < 100 (mmHg)

!!! Cyanosis Cong. H.D grey zone ~ 2.50, 100 (mmHg)

⊗ VSD, ASD, PDA, AVSD → they all Lt to Rt shunt ✓

⊗ AS, COA → obstructive lesions.

D.S. → HLH = hypoplastic left heart.

VSD - 1/5 20:100. F.M. 1:1 ✓ = defect in septum b/w Rt & Lt vent.

⊗ defect in upper part of septum = perimembranous MC

embryology → upper part: membranous

lower part: muscular.

Subject:

inlet type = v. high lesion part of AV canal.

~~high~~ rate of closure \rightarrow Muscular
Spontaneous

Pic 19 \rightarrow Deoxy blood \rightarrow Rt atrium \rightarrow Rt vent (sat 70-80%)

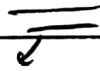
Oxy blood \rightarrow Rt Atrium \rightarrow Lt vent (sat 100%)

* Pr in LV $>$ RV \therefore Flow from high Pr to low Pr.



- So when left ventricle in systole (Contraction) \rightarrow some blood goes to systemic circulation & some to RV.

extra volume to Rt vent. \rightarrow so dilatation (volume overload) & extra blood to pulm. circulation & lungs.



- That's why tachypnea, gallop, cardiomegaly & SOB. b/c excessive B-flow towards pulm. circulation.

- blood to the systemic is 100% sat oxygenated \rightarrow so acyanotic
- so in VSD symp of HF without cyanosis

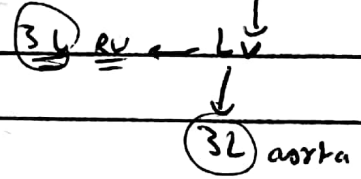
VSD appears \rightarrow 6w - 2m of life why late? b/c early the pr on Rt vent $>$ Lt vent.

example $3 \text{ L} \rightarrow 3 \text{ L}$

RA \rightarrow 3 liters of blood to the RV. \rightarrow 3 liters from LV



So 6L of blood \rightarrow Pulm. circulation \rightarrow 2A



Q_P / Q_A ratio = ratio btw pulm & syst. circulation.

2/1 \rightarrow 2 times blood goes to pulm. circulation.

⊗ the Right atrium is the only chamber that is not affected by VSD.

with time \rightarrow excessive flow in Pulm. Ar. \rightarrow \uparrow Pr \rightarrow Pulm. HTN.

So Pr in Pulm Ar \rightarrow systemic circulation

RT to LT shunt \rightarrow Deoxy. blood goes to systemic circulation

Eisenmenger synd = (RT \rightarrow LT) net shunt \rightarrow net shunt

(net shunt)

Subject:

/ /

Size of defect \rightarrow smaller = hear murmur \uparrow

larger \rightarrow murmur \downarrow but risk of H.F $\uparrow\uparrow$

Small defect VSD \rightarrow ~~only~~ may be only murmur

- increased flow in pulm. valve \rightarrow PSM \rightarrow Primary Mur?
 left lower sternal border

- pulm. HTN & Eisenmenger \rightarrow loud S₂ b/c pulm. part of S₂ is high

if Q_P/Q_A \rightarrow 2:1 \rightarrow (6L) to LA \rightarrow so \uparrow flow in mitral valve
 \rightarrow Diastolic murmur apical

Pic 2A \rightarrow cardiomegaly, prominent pulm. vasculature
 in 2 months baby \rightarrow one of DDA \rightarrow VSD \checkmark

Pic 3a \rightarrow cardiomegaly \rightarrow cardio thoracic ratio $> 60\%$

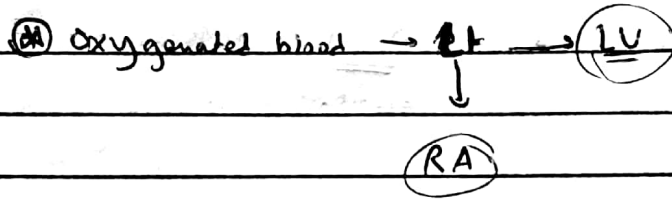
other type of VSD (not muscular or perimembranous) \rightarrow indication for surgery

► Subject :

ASD

Secundum = MC, ^{fossa ovalis} central part of septum

primum = lower part of atrium septum, part of AV ^{canal}



⊖ LA pr is low ⁽⁵⁻¹⁰⁾ → so no pr overload on Rt side

So no pr gradient toward Pulm. A

That's why No Pulm. HTN & Eisenmenger

⊖ In VSD there is pr gradient btw Rt & Lt vent.

⊖ so overload in RA → RA dilatation → overload RV.

Same QP/QA 2:1

⊖ the chamber not affected in ASD → LV

⊖ ASD is asymptomatic diagnosed by incidental finding
↓
murmur

Subject :

adult with RA dilatation arrhythmia etc

- older children may present with exercise intolerance

⊛ → Rt atrium flow ↑ → RV → Pulm. A ↓ flow

✓ Pulm. valve open → دوبل قسط / قسطان

fixed splitting of S₂ b/c of increase flow in Pulm. valve.

Murmur? ESM / normal growth / No H.F. like USD.

with osium premium → may have H. failure.

Pic 41 → normal heart size → prominent Pulm. vasculature.

ECG → Rt atrium dilatation = Prominent P. wave.

no TTT b/c no doesn't affect childrens life.

PDA

Pic 47 Pulm. vein → liver & syst. circulation → IVC → Rt atrium.

aorta ← DA ← Pulm. A ← RV

⊛ 90% of fetal blood from P.A → aorta (oxygenated B. from mother Umbilical. V.)
- 10% to lung

oxygenated 90% lung

Intra uterine \rightarrow P_r in pulm. A is v. high. so easier for blood to be shifted through DA. \checkmark than pulm. A.

after delivery \rightarrow physiological closure \rightarrow first day of life
anatomical closure \rightarrow 2 weeks of life

! \rightarrow duct \rightarrow \rightarrow 1) oxygen exposure \rightarrow vasoconst. of vessels on duct.

PG deficiency \rightarrow 2) Prostaglandins keep patency of DA \rightarrow from placenta.
So after delivery No PG \rightarrow closure of DA.

⊗ if duct not closed after 4 months \rightarrow abnormal

Pathological PDA

- most common association of PDA is premature baby

⊗ after delivery = asymptomatic

⊖ when pulm circulation \downarrow & syst. v. R \uparrow \rightarrow flow from aorta to pulm. A \rightarrow continuous flow of blood in systole & diastole

! \rightarrow VSD & PDA \rightarrow same circ

- PDA \rightarrow constant flow in systole & diastole

- VSD only in systole

Subject :

Pulm. A. ^{volume} ↑ overload → so Rt ventricle contract against high volume of Pulm. A → Pr overload on Rt. vent.

& volume overload on left side of heart.

So Pr overload on Rt side & volume overload on Lt side.

⊙ Bounding collapsing pulse → b/c higher dynamic circulation

⊙ after diastole → blood to the shunt.
↓
wide pulse pr ← Pr difference btw sys & diastolic

- significant wide pulse pr → Pr difference btw systolic & diastolic > 45.

medical TTT → D ↓ pre load = ↓ fluid input.

indomethacin = NSAID → COX enzyme inhibitor

So ↓ PG level → duct close

= Renal Failure

Indomethacin is for pre term.

term → $\frac{0.13 \text{ g/kg}}{\text{ml}} \times 100 \text{ ml}$

↓
elective closure = $\frac{0.25 \text{ g/kg}}{\text{ml}} \times 100 \text{ ml}$

Paracetamol as alternative to indomethacin / or renal failure

but- it increases liver enzyme.

► Subject :

AVSD & AV canal

⊗ Endocardial cushion defect → Complete connection btw atria & ventricle

- combination of ASD & VSD.

Complete connection is called Rt → Lt shunt. It is usually associated with ⊗
btw Rt & Lt chamber

⊗ The most common in down synd.