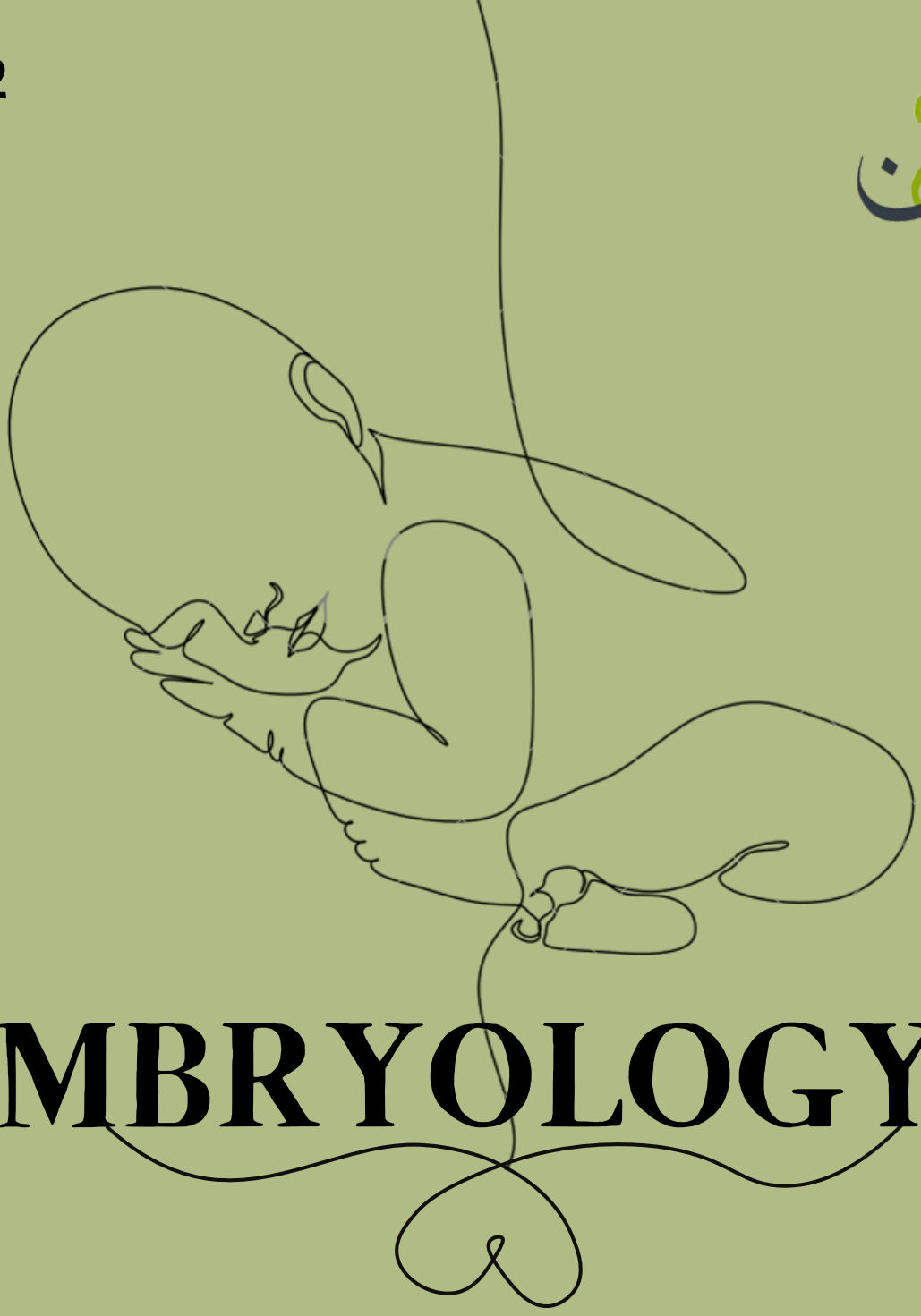
Sheet no. 2



CVS EMBRYOLOGY

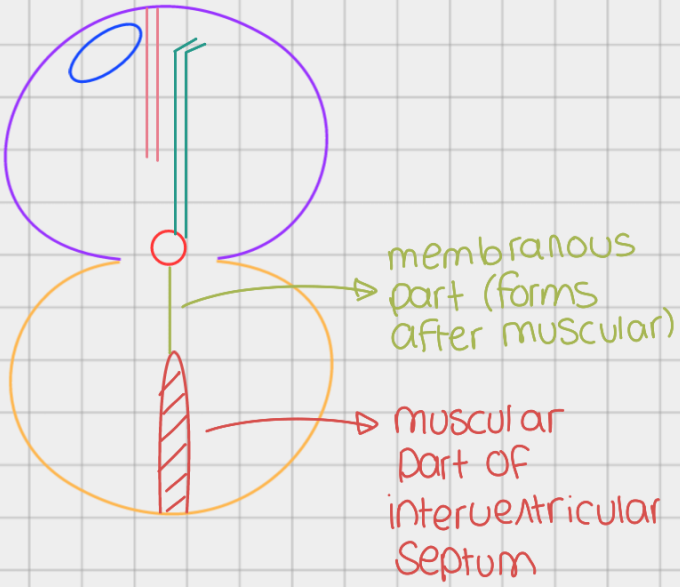
Written by Inssaf Alammouri

Corrected by Dr.Ahmad Alsalman

#الفريق_العلمي

EMBRYOLOGY (lec 2)

formation of the interventricular septum



* structures that contribute to the formation of the postnatal ventricular septum:
  1. the muscular ventricular septum
  2. the proximal parts of the outflow cushions (spiral septum or proximal bulbar septum)
  3. atrioventricular endocardial cushions

- the ventricular septum begins its development as a projection from the base or inf. wall of ventricle
- as it enlarges, the septum forms 2 horns which reach up to the corresponding a-v endocardial cushions
- the upper crescentric border of the septum bounds a temporary connection between the 2 ventricles called the interventricular foramen
- the ventricular septum forms the muscular part of the interventricular septum

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general notes about congenital anomalies (septal defects)

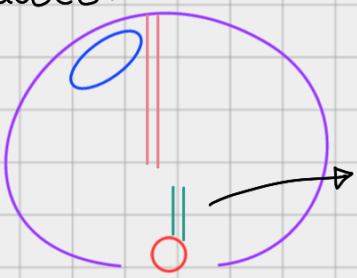
* blood shifts between rt & lt atria according to difference in pressure between them (shift from rt to lt is more dangerous because it's deoxygenated blood → cyanosis)
* rt to lt shunt → cyanotic conditions
* lt to rt shunt → non cyanotic conditions
* lt to rt shunt causes:
  - increased blood flow & pressure to lungs → pulmonary hypertension
  - pulmonary Htn causes marked proliferation of tunica intima & media of pulmonary muscular As & arterioles
  - pulmonary resistance becomes higher than systemic resistance & causes rt to lt shunting of blood → late cyanosis (at this stage the condition is called Eisenmenger complex

Congenital anomalies:

① inter atrial Septal defect (ASD) → ♀ > ♂

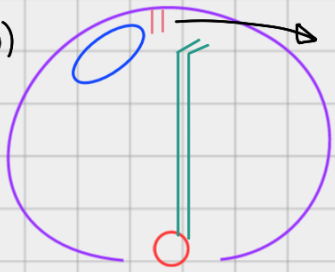
- causes:

a)



over degeneration of septum prime

b)



Septum secondum underdevelopment
- defect is above fossa ovalis level
- pressure lt > pressure rt → shift lt to rt
- no cyanosis / compatible with life

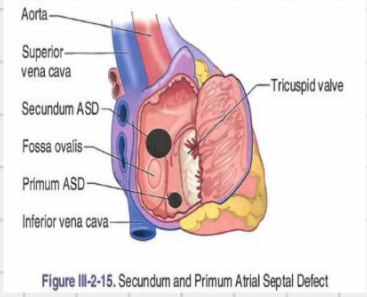
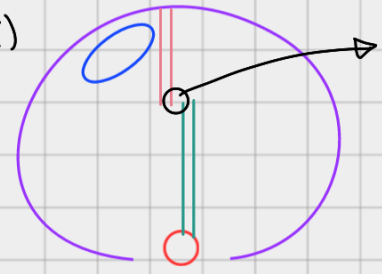
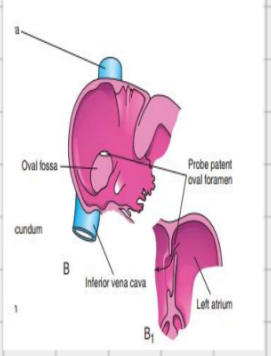


Figure III-2-15. Secundum and Primum Atrial Septal Defect

c)



probe patency (very small open foramen)



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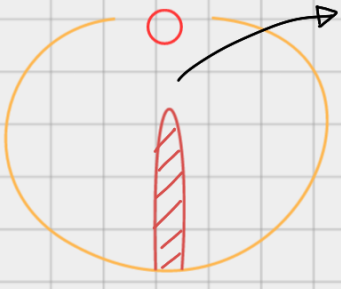
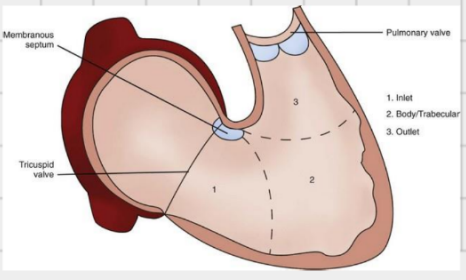
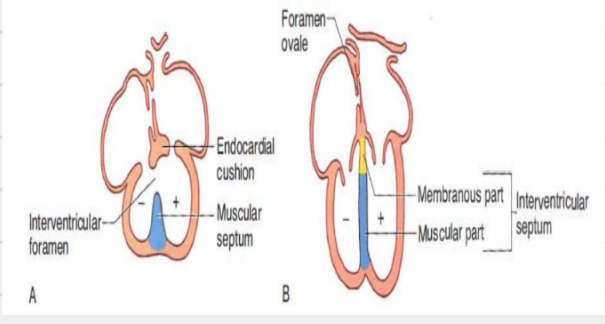
② inter ventricular Septal defect (VSD) → ♂ > ♀



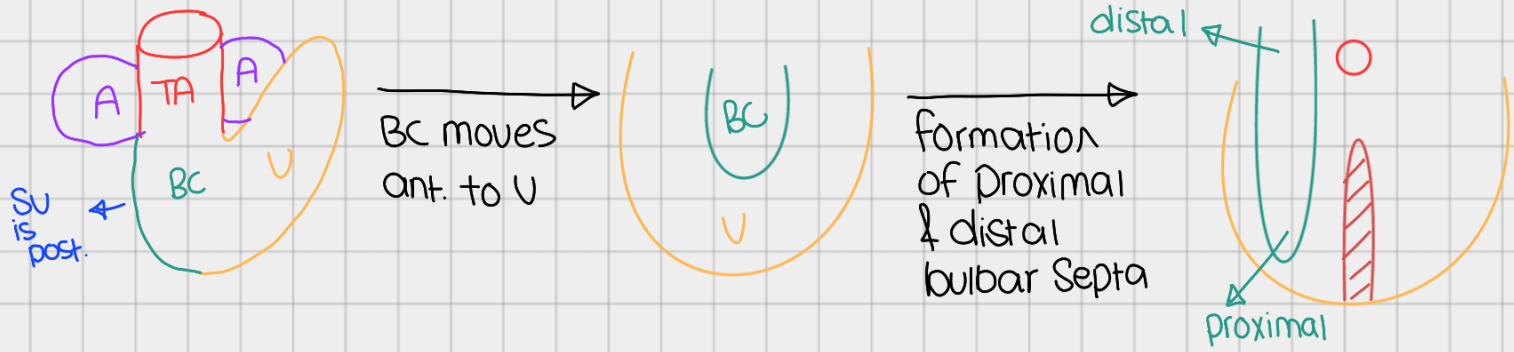
lt ventricle pressure > rt → Shift of blood from lt to rt (no cyanosis) → more blood to rt ventricle need to be pumped to pulmonary trunk → rt ventricle hypertrophy ↓↑ resistance → rt ventricle pressure > lt → Shift of blood from rt to lt (cyanosis) ⇝ Eisenmenger complex

- membranous part defect is because there is dynamic blood flow in the area of fusion between the 3 septa. (muscular interventricular, atrioventricular, proximal bulbar)

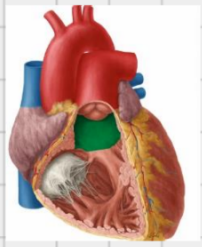


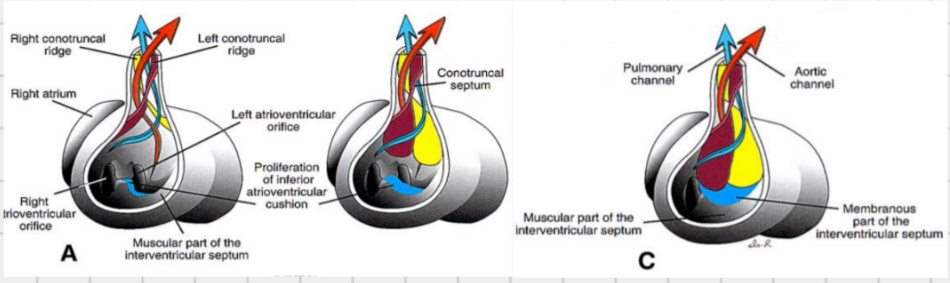


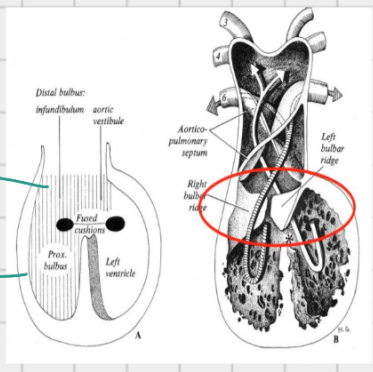
formation of truncal & bulbar Septa



* proximal bulbar Septum shares in:
  ① closing interventricular foramen (involved in forming the membranous part of the interventricular Septum)
  ② enters wall of ventricle & forms the outflow part (incorporated into walls of definitive ventricles in several ways: into the infundibulum & vestibule, forms aortic vestibule)







distal Septum ←
proximal Septum ←

* distal bulbar Septum involves in the formation of semilunar valves

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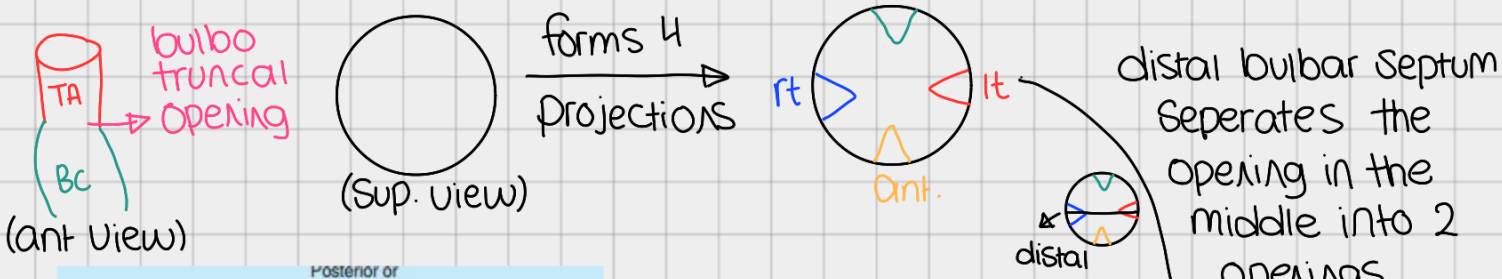
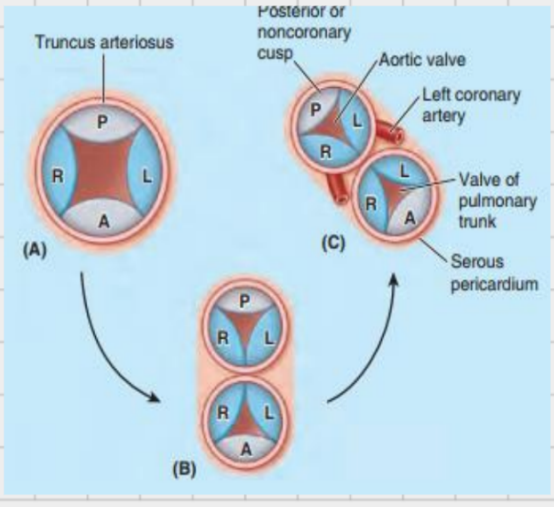
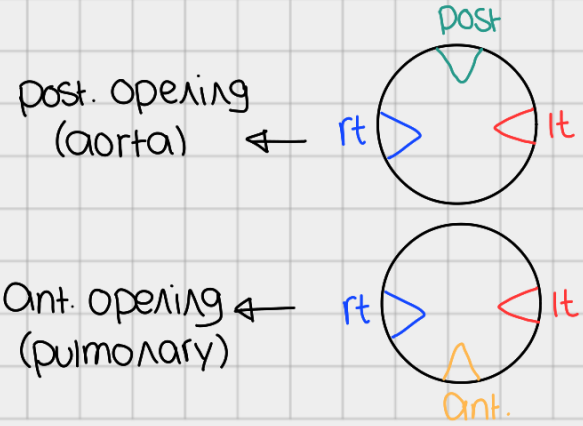
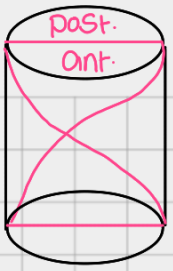
bulbotrunkal opening:



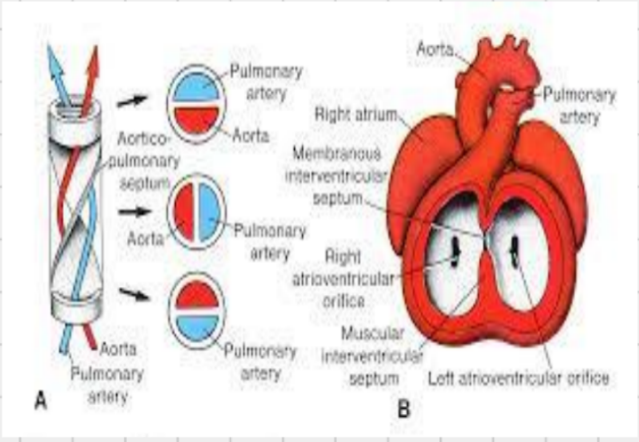






truncal septum (spiral aortico pulmonary septum:
spiral shaped septum/seperates aorta from pulmonary trunk

C → the upper part of the truncus (ant. ridge becomes lt & post. ridge becomes rt)
B → the middle part of the truncus (rt ridge becomes ant. & lt ridge becomes post.)
A → the lower part of the truncus (ridges are rt & lt as traced upwards)



note:
- ridges developed in truncus arteriosus after their fusion are called truncal septum
- ridges developed in the lumen of bulbus cordis after their fusion are called bulbar septum

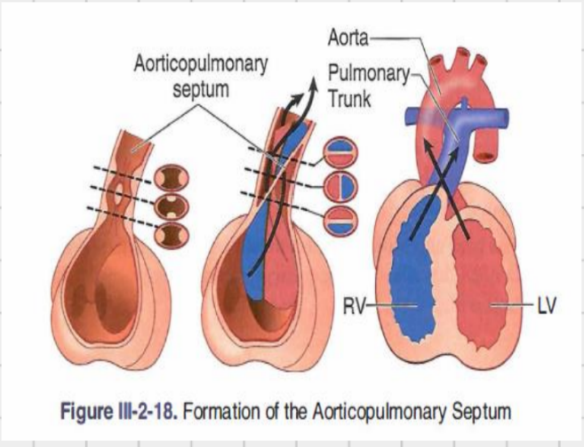


Figure III-2-18. Formation of the Aorticopulmonary Septum

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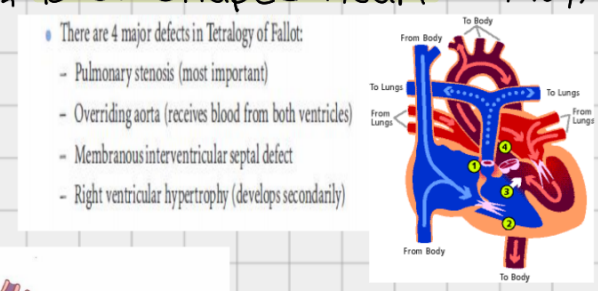
* congenital defects (truncus arteriosus defects)

① fallot tetralogy
- the most common cyanotic congenital heart defect that occurs with defects in the development of aorticopulmonary septum & is related to the failure of neural crest cells to migrate into trun us arteriosus
- aorticopulmonary septum fails to align properly & shifts ant. & to the rt → unfair aorticopulmonary septum → larger aorta & smaller pulmonary → pulmonary stenosis → ↑ pressure → rt ventricle hypertrophy → blood shift from rt to lt → cyanosis & boot shaped heart (in X ray)



② transposition of great vessels
the septum isn't spiral → pulmonary (rt) & aorta (lt) → aorta carries deoxygenated & pulmonary carry oxygenated / usually comes with VSD or ASD → helps patient until surgery

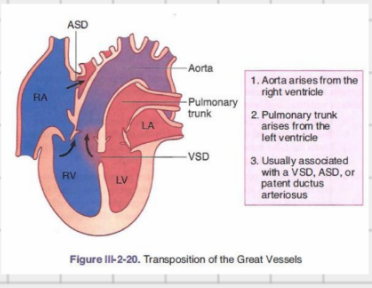


Figure III-2-20. Transposition of the Great Vessels

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reviewed by
Dr. Ahmed Salman