

وسهلا



أهلا

يُمنع أخذ السلايدات بدون
إذن المحرر واي اجراء
يخالف ذلك يقع تحت طائلة
المسؤولية القانونية
جميع المعلومات للاستخدام
التعليمي فقط

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

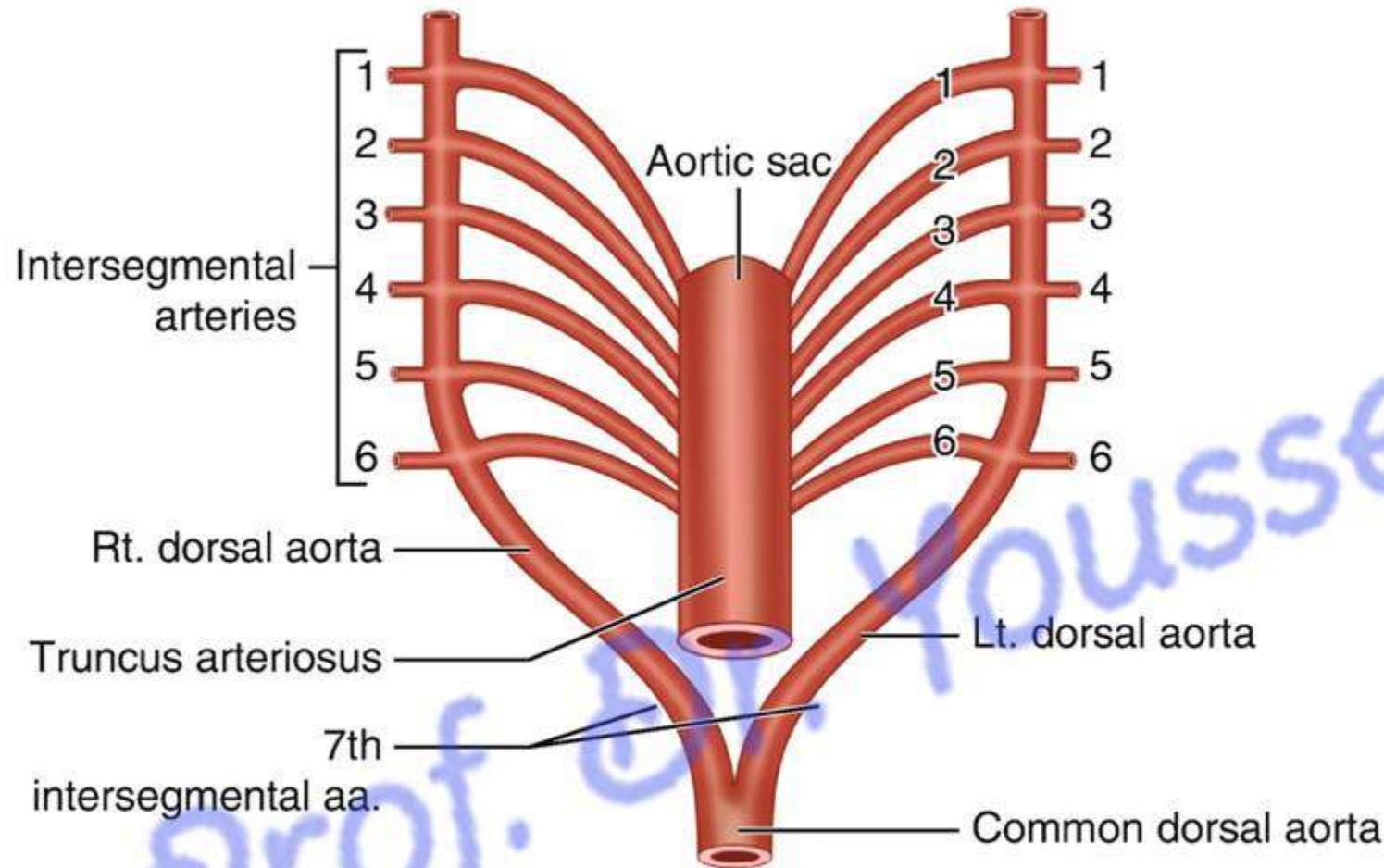
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Development of blood vessels

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Primitive aorta



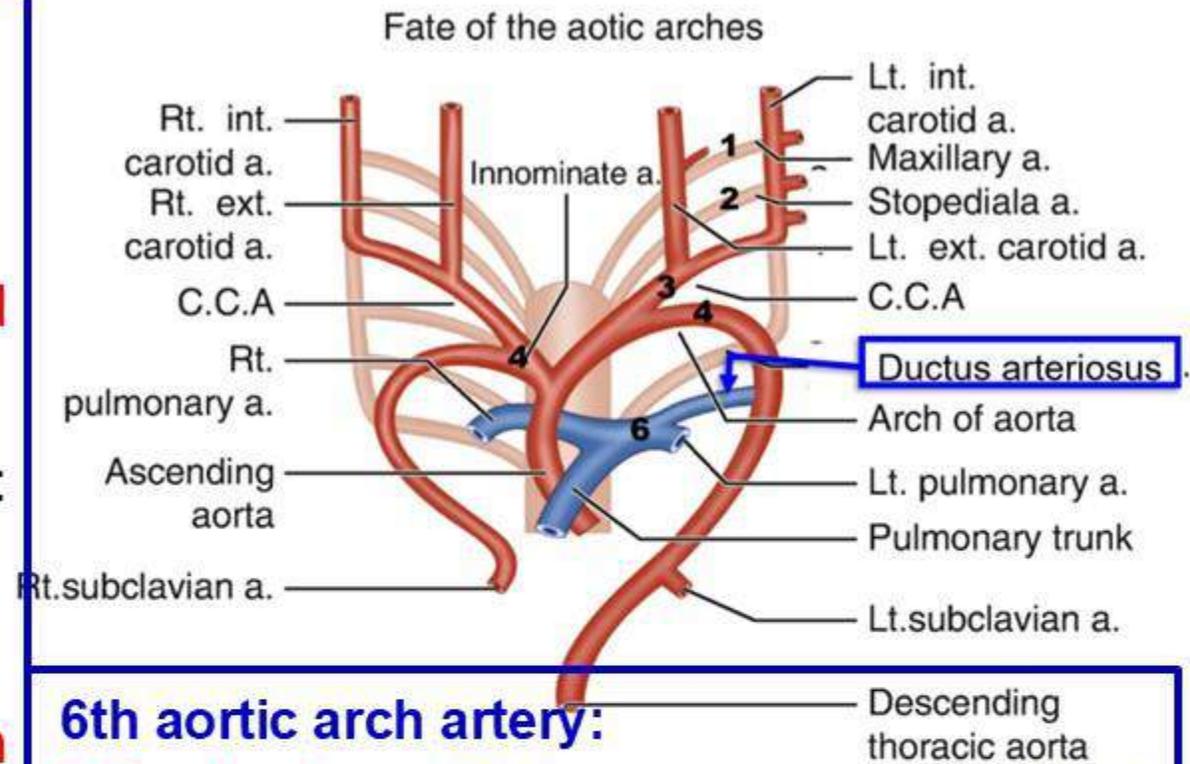
1- 2 dorsal aortae. After lateral folding of the embryo, the 2 dorsal aortae caudal to the 4th thoracic somite fused and form one **common dorsal aorta**.

2- 2 ventral aortae fused together to form **aortic sac**.

3- 6 pairs of pharyngeal arch arteries connect the 2 dorsal aortae with aortic sac.

- **Derivatives of the pharyngeal arch arteries**

- **1st arch artery (M):** forms **maxillary artery**.
- **2nd arch artery (S):** forms **stapedial (caroticotympanic) artery**.
- **3rd arch artery (C) (3 carotid arteries):** common, internal and external carotid arteries.
- **4th aortic arch artery:** differs on the 2 sides:
 - a- On the **left side:** forms part of the **arch of aorta**.
 - b- On the **right side:** forms distal part of right **innominate (brachiocephalic) artery** and proximal part of the **right subclavian artery**.
- **5th aortic arch artery:** disappears on both sides



6th aortic arch artery:

1. Proximal part Pulmonary arteries on **both sides**.

2. Distal part: a) Right side **degenerated**

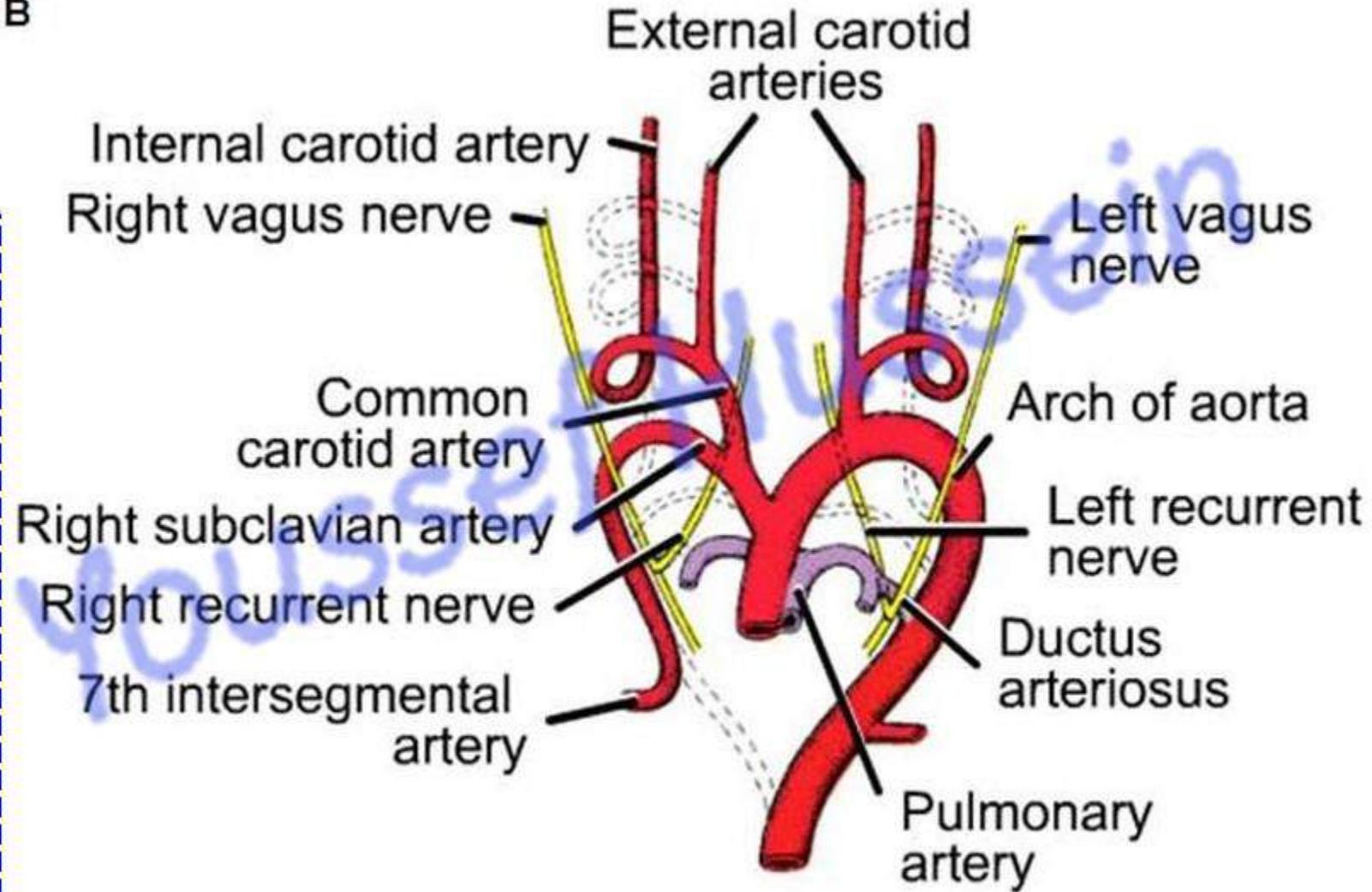
b) Left side: Ductus arteriosus between left pulmonary artery and arch of aorta. After birth; it is obliterated and forms **ligamentum arteriosum**.

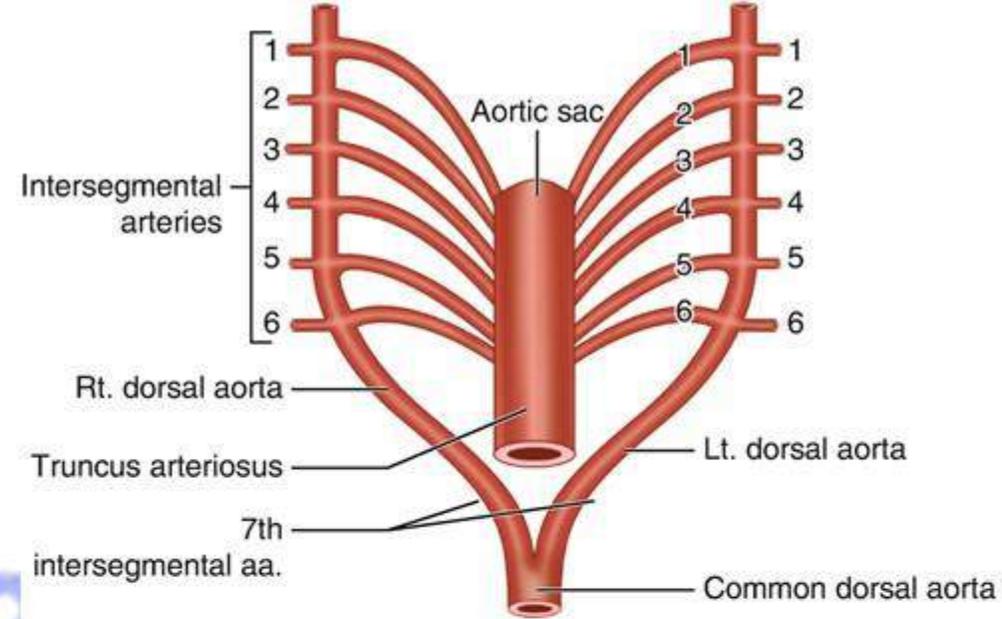
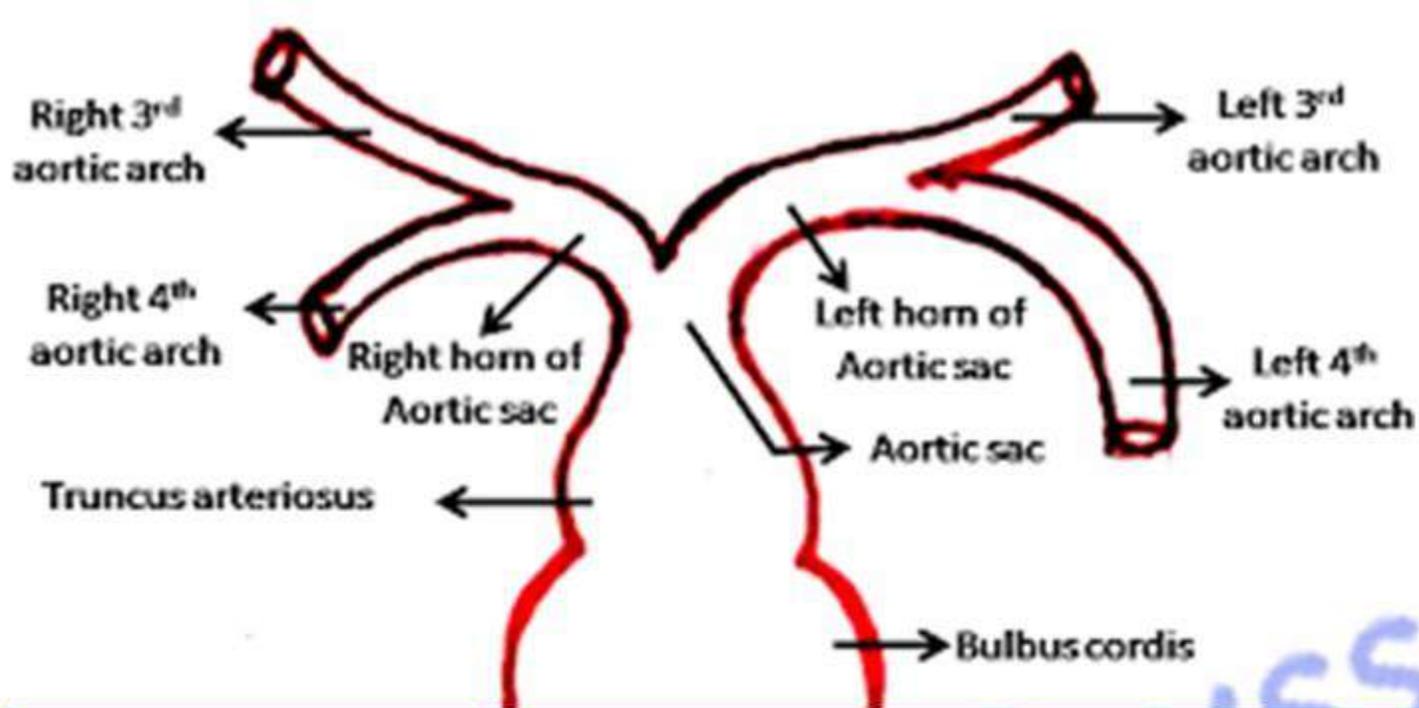
N. B. During the development of the arteries:

1- **The right recurrent laryngeal nerve** turn around the **right subclavian in the neck** because degeneration of the distal part of the right 6th arch artery.

2- **The left nerve** turn around the **ligamentum arteriosum in the thorax.**

B





- **Development of the Arch of aorta**

1st part, from the **aortic sac**.

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2nd part, from the **Left horn of the aortic sac** (The right horn forms the proximal part of brachiocephalic artery)

3rd part, from the **Left 4th pharyngeal arch artery**.

4th part, from the **left dorsal aorta** from the left 4th pharyngeal artery to the common dorsal aorta at 4th thoracic somite. **Right dorsal aorta disappear**

- **Truncus arteriosus of the bulbus cordis gives Ascending aorta and pulmonary trunk**

- **Intersegmental arteries**

- Blood vessels that originate from the embryonic dorsal aorta and supply blood to segments of the developing body,

1- Occipital intersegmental arteries, disappear.

2- Cervical intersegmental arteries:

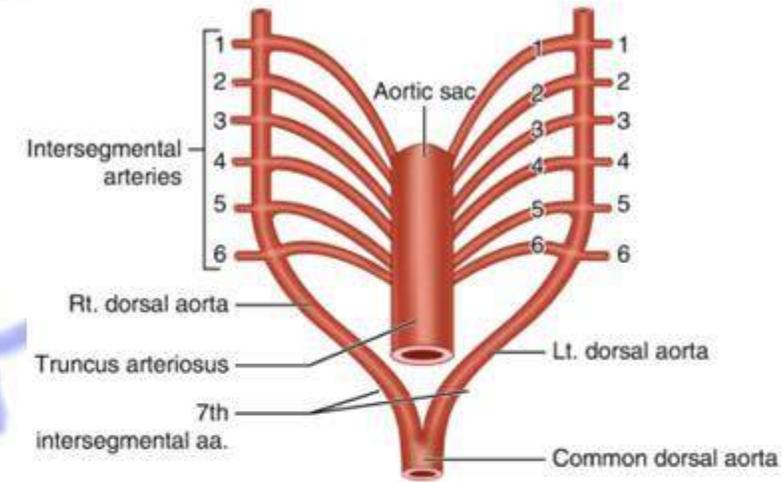
a- The upper 6 arteries disappear.

b- The 7th cervical intersegmental artery: gives subclavian artery

3- Thoracic intersegmental arteries: form posterior intercostal and the subcostal arteries.

4- Lumbar intersegmental arteries gives lumbar arteries

5. Sacral intersegmental arteries: form lateral sacral arteries.



Congenital anomalies of arch of aorta

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- **Double arch of the aorta:**

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- It is caused by persistence of the right dorsal aorta.

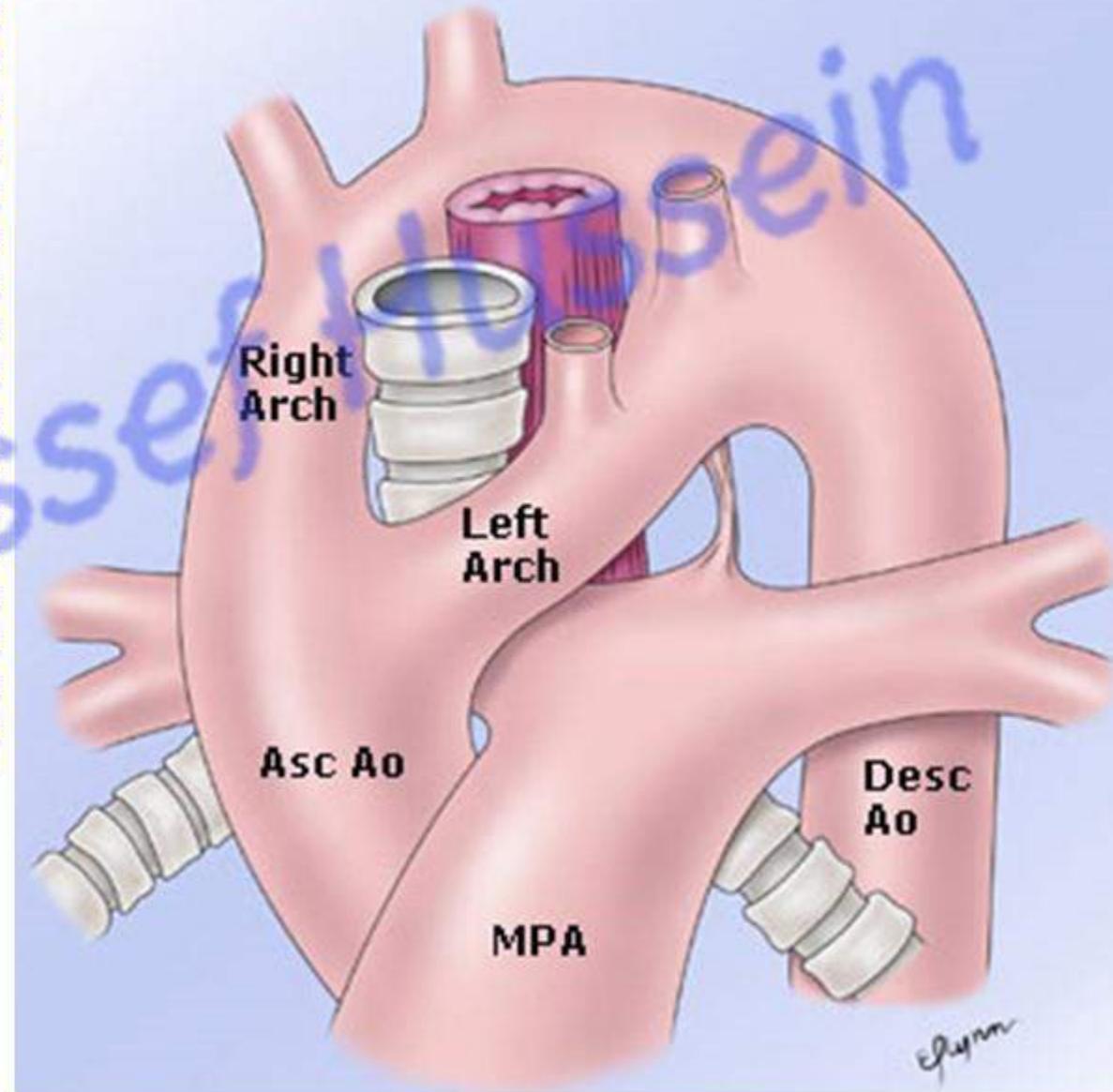
- **They form a ring around**

1. **Trachea** leading to difficult in breathing (*dyspnea*)

2. **Esophagus** leading to difficult swallowing (*dysphagia*).

Right side arch of aorta:

- due to persistence of right dorsal aorta and degeneration of the left dorsal aorta



- **Coarctation of the aorta:**

- It means narrowing of the aorta distal to the origin of the left subclavian artery.

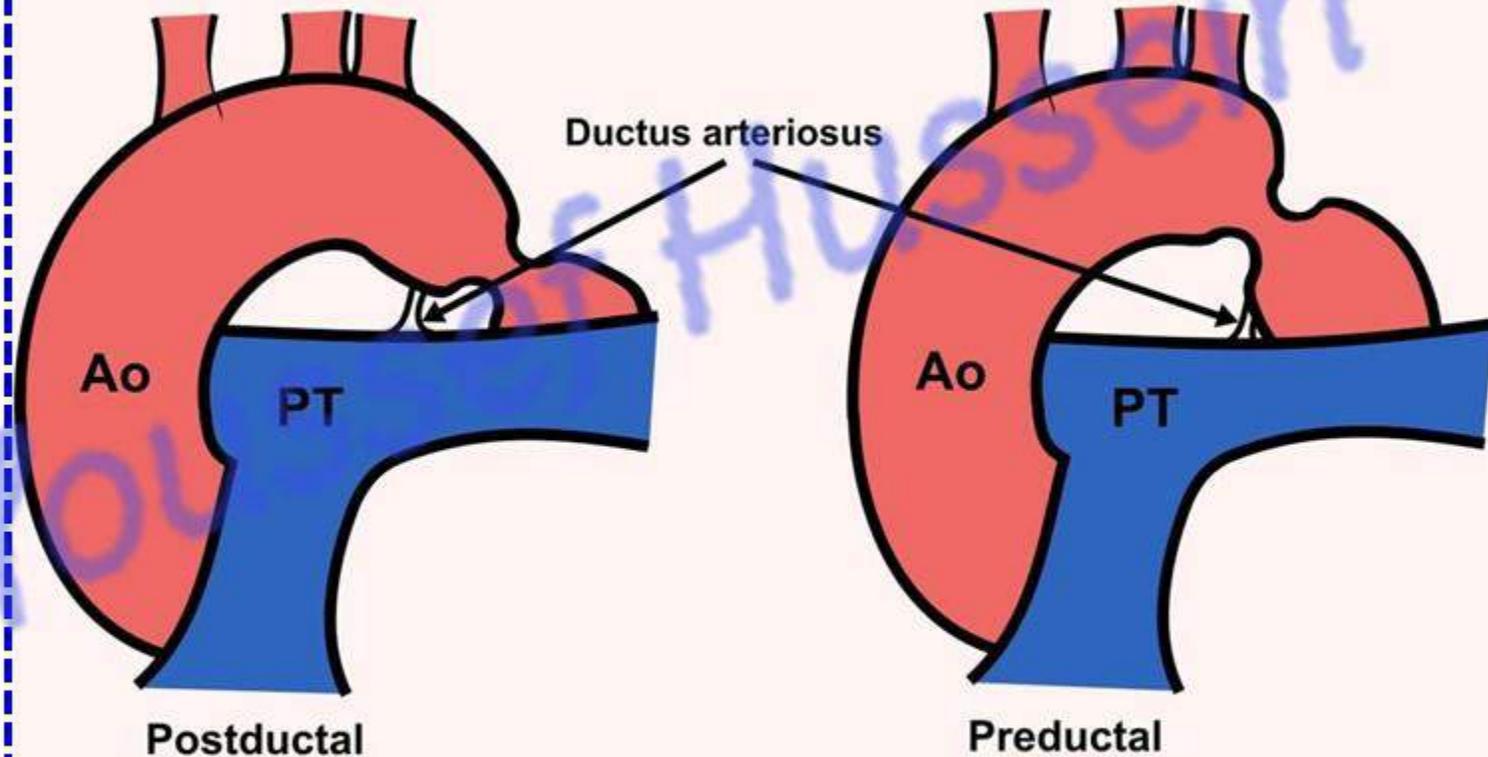
- **Causes,** Contraction and shortening of ductus arteriosus.

- **Types:**

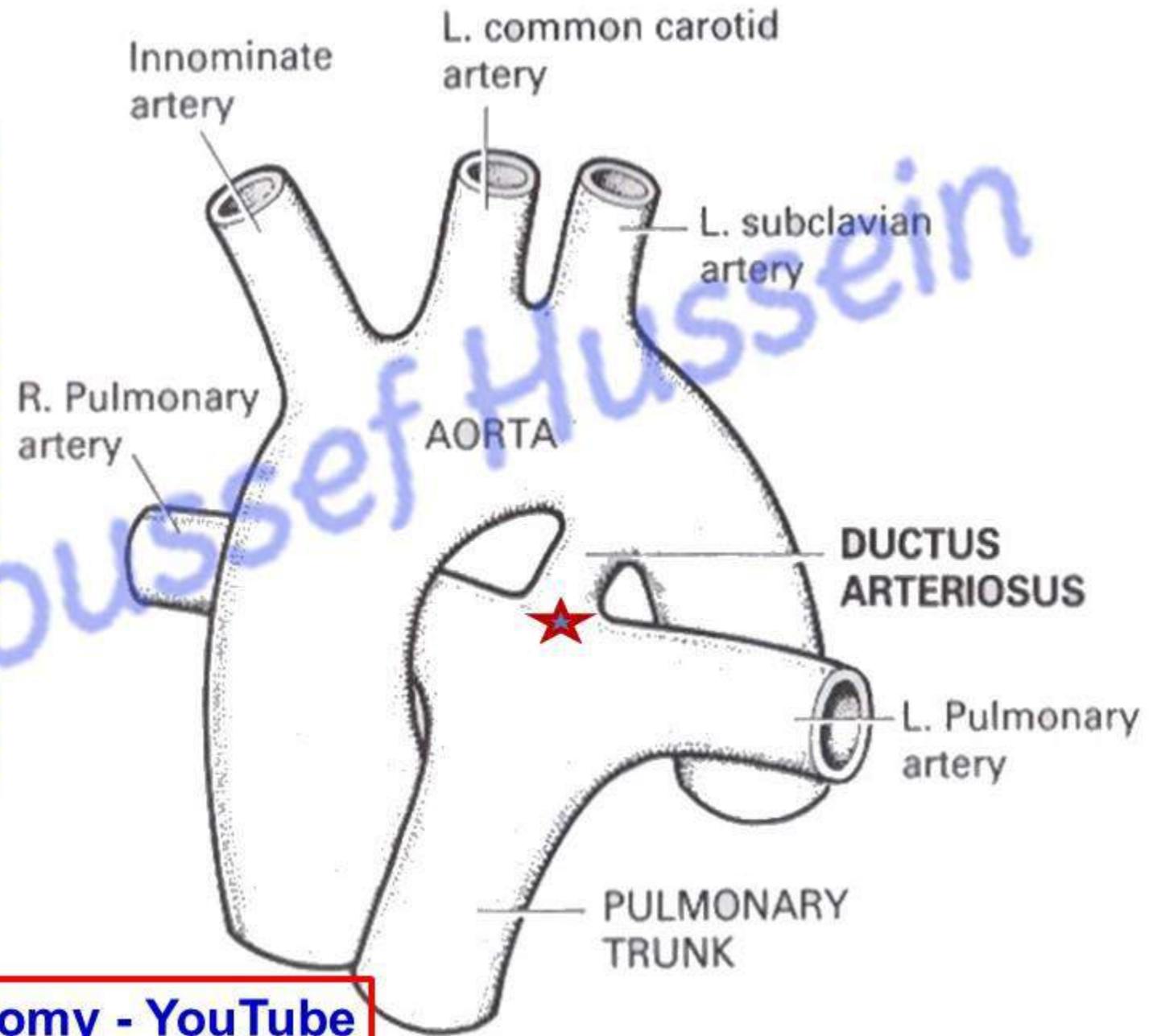
- a. **Preductal:** proximal to the opening of ductus arteriosus.

- b. **Postductal:** distal to the opening of ductus arteriosus.

Coarctation of the Aorta

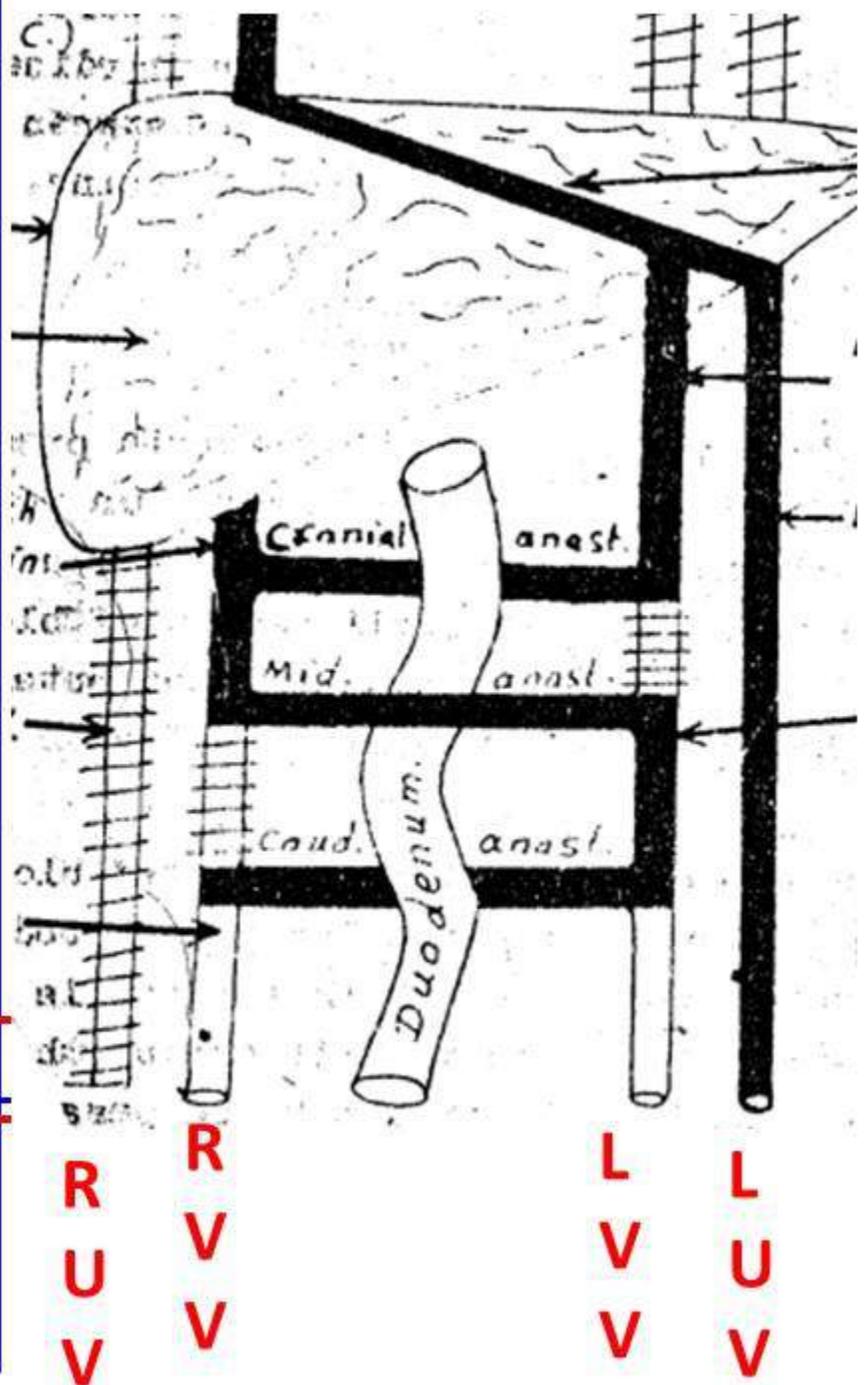


- **Patent ductus arteriosus**
- failure of obliteration of the ductus arteriosus leading to communication between the aorta and left pulmonary artery.



- **Development of the portal vein**

- * **3 transverse anastomotic veins** develop between the right and left vitelline veins around the duodenum.
- * The right and left vitelline veins caudal to the caudal transverse anastomosis **disappear**.
- * The right vitelline vein between the caudal and middle anastomosis **degenerated** while the left vein between the middle and cranial anastomosis **degenerated**.
- * These changes resulted in formation of **S-shaped vessel** that forms the portal vein.



Development of IVC

1- **Suprahepatic part:** from proximal part of **right vitelline vein.**

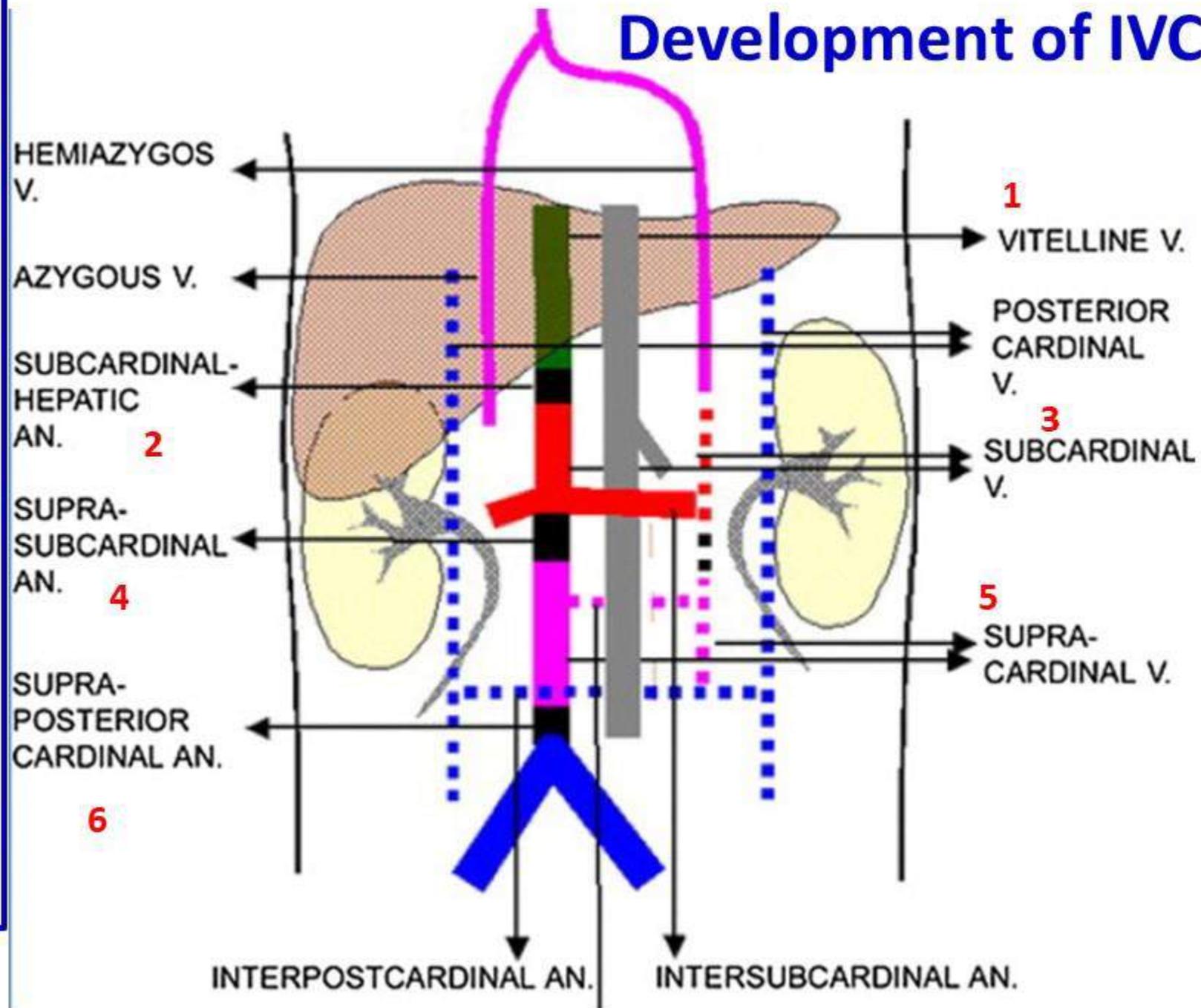
2- **Hepatic part:** from **anastomosis** between right vitelline vein and right subcardinal vein.

3- **Suprarenal (Pre) part:** from **right subcardinal vein.**

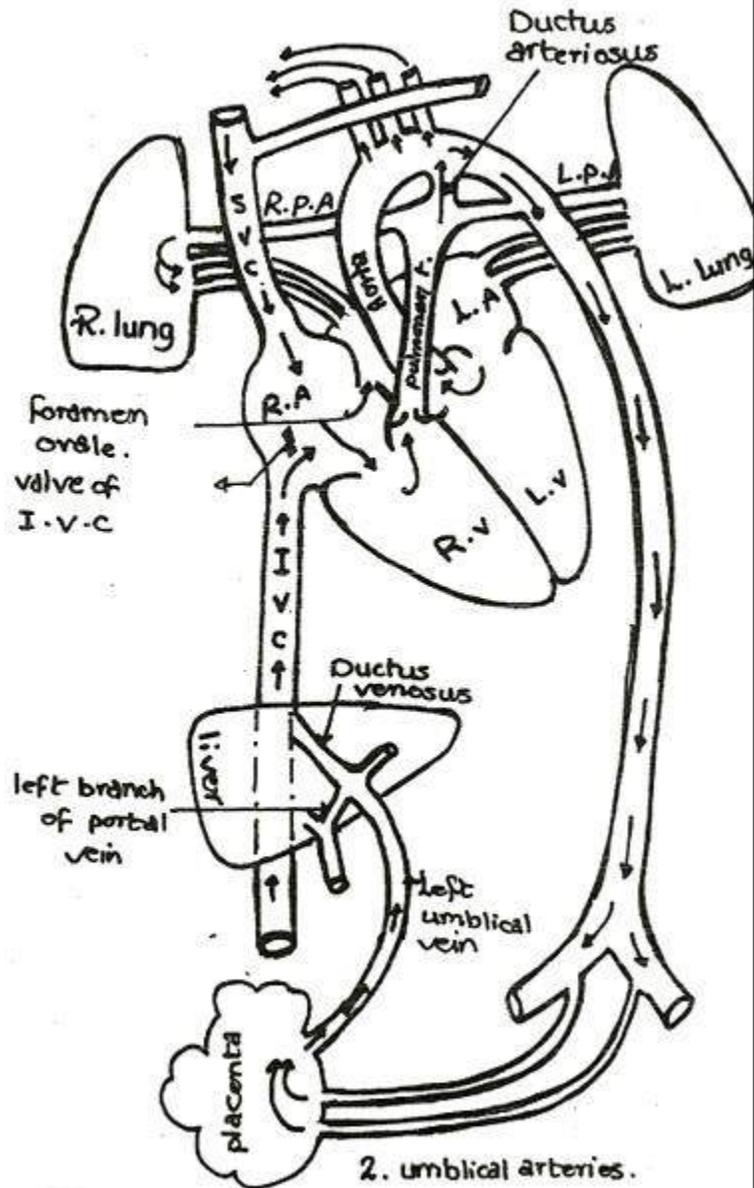
4- **Renal part:** from **anastomosis** between right subcardinal and right supracardinal veins.

5- **Infrarenal (post) part:** from **right supracardinal vein.**

- The left supracardinal and subcardinal veins mostly regress



Foetal circulation



- **Placenta** --oxygenated blood along the **left umbilical vein** – **liver** -- **Ductus venosus** --**IVC** (the oxygenated blood mixes with small amount of the venous blood coming from the lower half of the body) -- **Right atrium** --**foramen ovale** --**left atrium** - directed by 1. The opening of IVC lies opposite the foramen ovale, 2. Valve of IVC directs the blood toward the foramen ovale. **Through mitral valve to Left ventricle** -- **ascending aorta** – arch of the aorta to supply mainly the **heart and the upper half of the body** which are rapidly growth.
- **Venous blood from upper half of the body** ---**SVC** -- right atrium --**Nonoxygenated blood** mixed with small amount of oxygenated fall from IVC valve --Through tricuspid valve to **RV- pulmonary trunk** ---**Pulmonary arteries**-- **Ductus arteriosus** (between the left pulmonary artery and arch of the aorta, Because the lungs are not functioning during fetal life)---**descending thoracic aorta** --- **lower half of the body**
- **Blood return through** --**two umbilical arteries** -----**placenta**

Postnatal changes

- 1- Left umbilical vein** is obliterated to form **ligamentum teres** of the liver.
- 2- Ductus venosus** is obliterated to form **ligamentum venosum** of the liver
- 3- Closure of the foramen ovale:** to form **fossa ovalis**
- 4- Ductus arteriosus** is obliterated to form **ligamentum arteriosum.**
- 5- Two umbilical arteries** are obliterated to form **two medial umbilical ligaments** of the urinary bladder.

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Thank You
Questions

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