

DATE

PAGE

ARTERIAL

ARCHES

The Arteries of body develop from two sources

- pharyngeal (aortic) arch arteries,
- dorsal aorta.

- aortic arches $\xrightarrow{\text{gives rise to}}$ arteries of head and neck.
- dorsal aorta \longrightarrow arteries of rest of body.

PHARYNGEAL ARCH ARTERIES AND THEIR DERIVATIVES.

1. First artery to appear in embryo \rightarrow right & left primitive aorta.
they become continuous with primitive heart tubes.

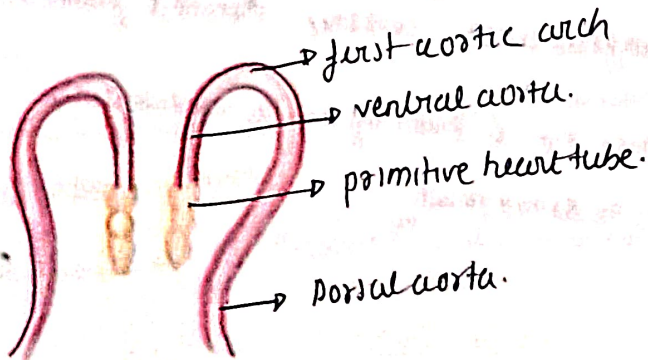
2. Each primitive aorta is divided to

- \rightarrow ventral aorta.
- \rightarrow first aortic arch artery.
- \rightarrow dorsal aorta.

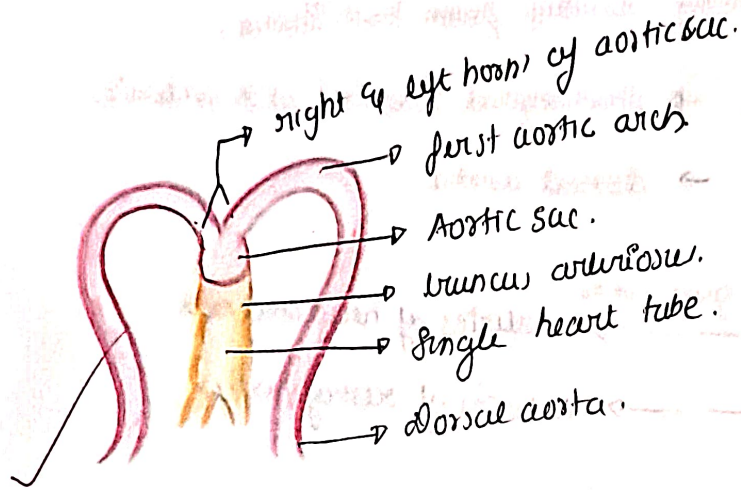
• part ventral to foregut \rightarrow ventral aorta.

• part dorsal to gut \rightarrow dorsal aorta.

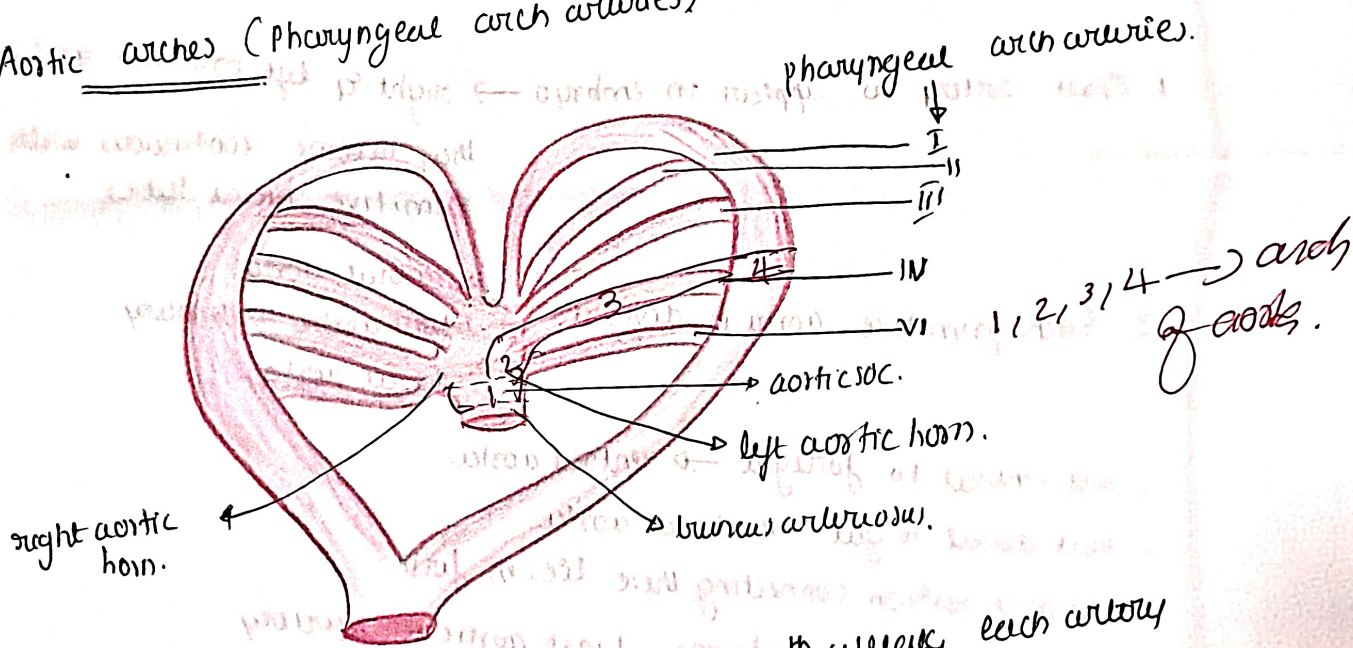
• arched portion connecting these lies in first pharyngeal arch \rightarrow forms first aortic arch artery.



Formation of aortic sac and its fusion with single heart tube.



Aortic arches (Pharyngeal arch arteries)



As pharyngeal arches develop during 4th & 5th weeks, each artery is supplied by → pharyngeal arch artery. derived from aortic sac.

∴ aortic sac gives rise to 6 pair of aortic arch artery. 7th pair appears to disappear.

DERIVATIVES OF AORTIC ARCH ARTERIES.

Arch artery

Derivatives

First arch artery

maxillary artery.

Second arch artery.

Hyaloid and stapedial arteries in fetal life only

Third arch artery

Common carotid, proximal part of internal carotid, external carotid.

Fourth arch artery.

left side → part of arch of aorta.
right side → proximal part of right subclavian artery.

Sixth arch artery

left side → left pulmonary artery duct, arteriosus.

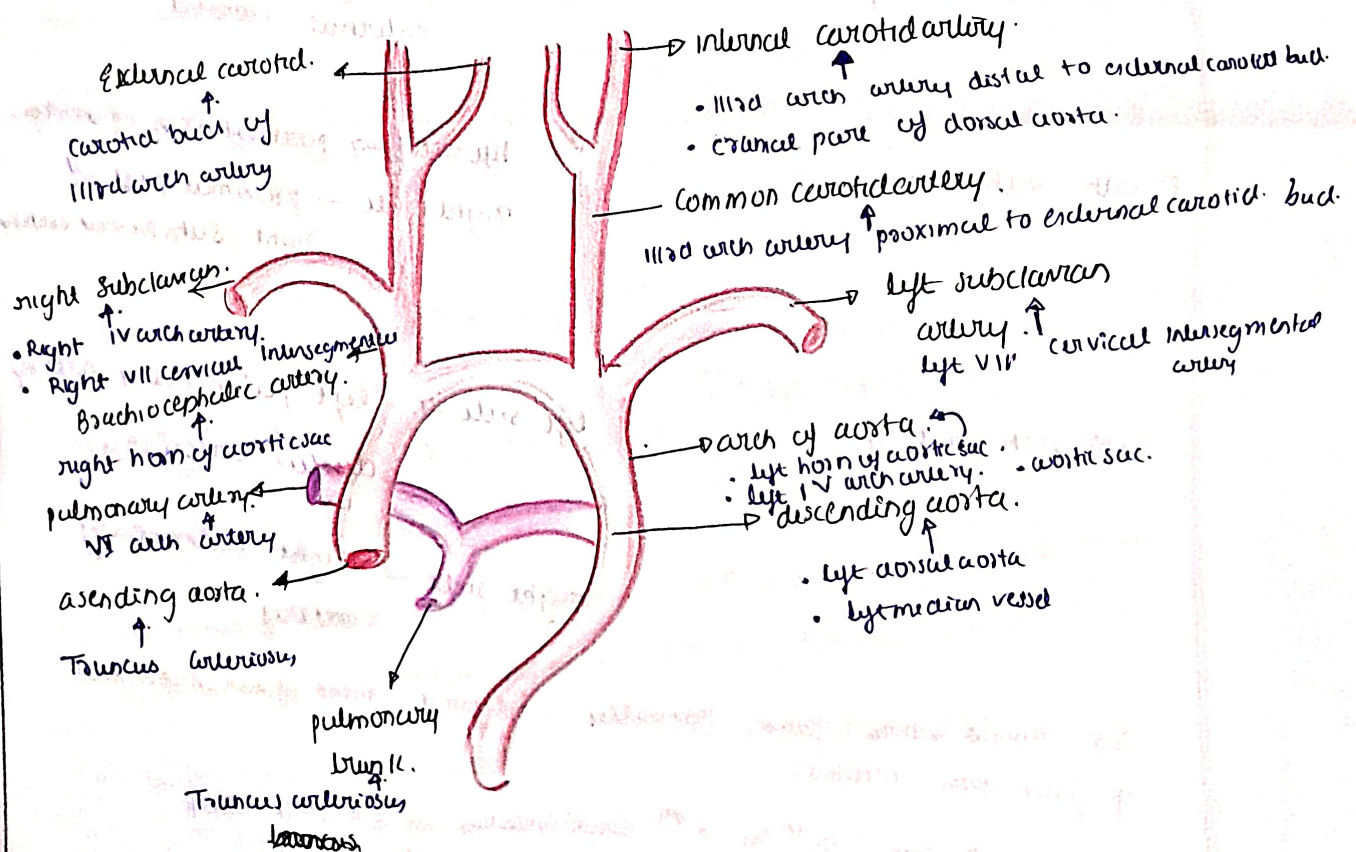
right side → right pulmonary artery.

• Two dorsal aorta grow caudally, beyond point of attachment of first arch arteries.

• Portion between 11th and 14th arch artery → carotid duct disappears

3. Right dorsal aorta below 4th arch artery disappears.
4. 6th arch artery → artery to developing lung bud
5. 3rd arch artery → external carotid artery.
6. 7th cervical intersegmental artery supplying upper limb bud on each side comes to be attached to dorsal aorta at site of attachment of 4th arch artery.

Right common carotid artery and right subclavian artery appear as branches of brachiocephalic artery.



SOURCES OF DEVELOPMENT OF MAIN ARTERIES.

Arteries

Source of development.

Arch of aorta.

(a) aortic sac (ventral part)

(b) left horn of aortic sac.

(c) left fourth arch with artery.

d, Part of dorsal aorta

Right horn of aortic sac.

Brachiocephalic artery

(a) proximal part from right 1st arch with artery.

Right subclavian artery

(b) distal part from right 7th cervical intersegmental artery.

Left subclavian artery.

Left 7th cervical intersegmental artery.

Common carotid artery

3rd arch artery proximal to external carotid artery bud.

Internal carotid artery.

3rd arch artery distal to the external carotid bud & cranial part of dorsal aorta distal to the attachment of 3rd arch artery.

External carotid artery

Bud from 3rd arch artery.

Pulmonary arteries

Part of 6th arch artery b/w pulmonary trunk & branch to lung bud on each side.

Descending aorta

(a) proximal part from left dorsal aorta distal attachment

of fourth arch with artery (b) distal part from fused dorsal aorta forming single median artery.

CLINICAL CORRELATION

- (1) Patent ductus arteriosus Preductal
- (2) Coarctation of aorta. Post-ductal.
- (3) Abnormal origin of right subclavian artery.
- (4) Double aortic arch.
- (5) Right arch of aorta.