Pharyngeal Arch Derivatives: 3rd Arch

The pharyngeal arches (also known as branchial arches) are a fundamental aspect of vertebrate head and neck development. They are all derived from mesoderm and appear early in the third to fourth gestational week, and differentiate into terminal structures by the seventh to eighth gestational week. They are comprised of cartilage support (serving as a precursor to skeletal elements), arterial supply (from the aortic arch system) and cranial nerve supply. The third pharyngeal arch cartilage develops into the greater horn of the hyoid. The muscle derived from the third pharyngeal arch is the stylopharyngeus. The cranial nerve supply to these structures is CN IX (glossopharyngeal nerve). The six pairs of pharyngeal arch arteries have varying fates, and the third pair produces the common and internal carotid arteries.

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Cartilage

Greater Horn of Hyoid
Greater Horn of the Hieroglyph
The hyoid is a horseshoe-shaped bone that is located in the anterior neck at the level of C3. It is located between the mandible and the thyroid cartilage. The second pharyngeal arch gives rise to the lesser horn of the hyoid, while the third pharyngeal arch gives rise to the greater horn of the hyoid.

Muscles

Stylopharyngeus
Stylus-pharaoh
The stylopharyngeus originates from the styloid process of the temporal bone and inserts on the thyroid cartilage. It acts to elevate the pharynx during swallowing and speech. Since this muscle develops from the third pharyngeal arch, it is innervated by CN IX (glossopharyngeal).

Nerves

CN IX (Glossopharyngeal)
Cranial Nerve (9) Lollipop with Glass-pharaoh
CN IX is also known as the glossopharyngeal nerve. It is a motor and sensory nerve that has various functions, including swallowing and taste sensation for the posterior one-third of the tongue.

Arteries

Common Carotid
Commoner Carrot
The third pharyngeal arch is tightly associated with the third aortic arch. This aortic arch develops into the common carotid artery and proximal part of the internal carotid artery. The right common carotid arises from the brachiocephalic artery. The left common carotid arises from the aortic arch.

Internal Carotid
Internal Carrot
The third pair of pharyngeal arch arteries develops into the common carotid artery and proximal part of the internal carotid artery. The internal carotid arteries arise from the common carotid arteries.

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