College of Veterinary Medicine

Date: 2024-2025

Unit of Scientific Affairs

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Lecture title: Embryonic development of digestive system / The branchial arches

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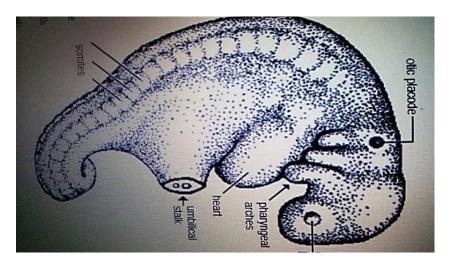
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Embryonic development of digestive system

The branchial arches

The skeletal components of each branchial arch are: Cartilage, Skeletal muscles, Vein, Nerve, Artery (aortic arch)



Derivatives of branchial arches:

| Branchial arches | Cartilage derivatives | Muscles | Nerve | Artery |
|--------------------------------|--------------------------|----------------------|------------|--------------|
| 1 st branchial arch | malleus , incus , | Mastication muscles, | Mandibular | First aortic |

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| (Mandibular arch) | mavillary prominence | mylohyoidous tonsor | division of | arch |
|--------------------------------|--------------------------|---------------------------|--------------|--------------|
| (Mandibular arch) | maxillary prominence | | | |
| called Meckel's | and mandibular | veli palatini, tensor | Trigeminal | (transitory) |
| cartilage in embryo | prominence . | tympani, anterior | nerve | |
| | | belly of digastricus | | |
| | | | | |
| 2 nd branchial arch | Stapes, styloid proces | Stapedius m., muscles | Facial nerve | Stapedial |
| (hyoid arch) called | of temporal bone, | of facial expressions | | artery |
| Reichert's cartilage | styloid ligament, | ,stylohyoideus, caudal | | (transitory) |
| embryo | stylohyoid bone . | belly of digastricus . | | , ,, |
| Cilibryo | stylolly old bolle . | belly of digustricus. | | |
| 3 rd branchial arch | ceratohyoid and othe | Stylopharyngeus | Glosso- | Common |
| | parts of hyoid bone . | caudalis muscle | pharyngeal | carotid & |
| | parts or riyola solic. | (dilator muscle of | nerve . | internal |
| | | | Herve . | |
| | | pharynx) . | | carotid |
| | | | | arteries |
| 4 th branchial arch | Laryngeal cartilages | Pharyngeal muscles | Vagus | Right |
| | except arytenoid . | except dilator, muscles | _ | subclavian |
| | except al yteriola. | - | | |
| | | of pharynx , levator | branch) | and aortic |
| | | veli palatini , extrinsic | | arch in the |
| | | muscles of larynx . | | left . |
| 6 th branchial arch | Arytenoid cartilages | Intrinsic muscles of | Vagus nerve | The part |
| o brancinar aren | 7 ii y cerioia car mages | the larynx . | (recurrent | between |
| | | the larytix. | • | |
| | | | laryngeal) | pulmonary |
| | | | | trunk and |
| | | | | dorsal aorta |
| | | | | |

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Derivatives of pharyngeal pouches:

| 1-First pharyngeal | pouch : give rise to —— | — ∓ ubo-tymp | anic recess |
|--------------------|---|--------------------------|-----------------------------|
| | Tympanic cavity (middle e | ar) | auditory tube |
| 2-Second pharynge | eal pouch : give rise to — | ——→Palatine | e tonsil |
| 3-Third pharyngea | I pouch : Dorsal part give ventral part Thymus | e rise to −ex | ternal parathyroid gland |
| 4-Fourth pharyn | geal pouch: Dorsal part good part good part good part good part Ultimo-branchia | | internal parathyroid gland |
| | | | |

Parafollicular cells of thyroid gland

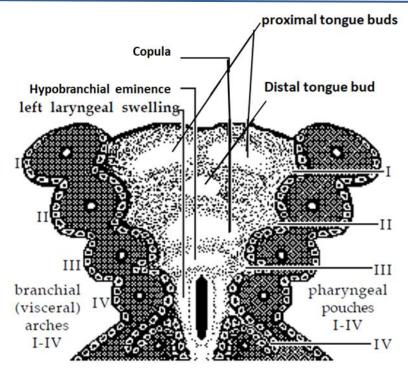
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Dorsal view of floor of primitive pharynx (the roof is removed)

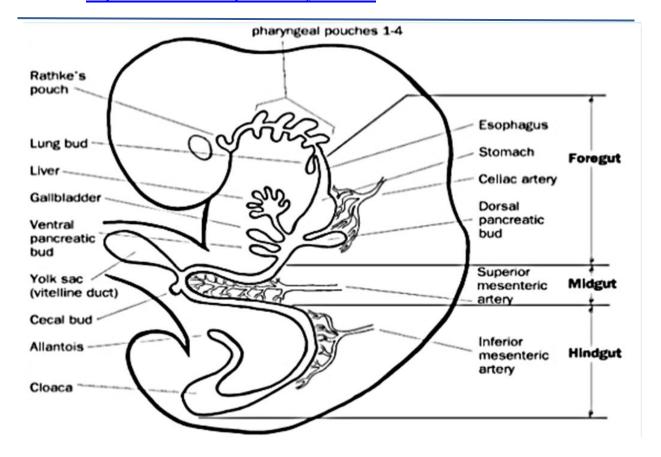
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Development of the tongue:

The tongue derived from the mesenchymal cells of 1st to 4th branchial arches as follow

The **mesenchym**al cells of the **1**st **branchial arch** give rise to

two **distal tongue buds** and one **median tongue bud** give rise to

The oral part of tongue (cranial two thirds (2/3) of the tongue)

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The oral part of the tongue innervated by:

- 1-Chorda tympani nerve which is a branch of facial nerve.
- 2-Lingual nerve which is a branch of mandibular nerve (division of trigeminal nerve).
- 3-Hypoglossal nerve.

The **mesenchymal** cells of the **2**nd , **3**rd , **4**th **branchial arches** give rise to

Copula and hypo branchial eminence

give rise to

The pharyngeal part of the tongue (caudal third of the tongue)

Pharyngeal part of the tongue innervated by glossopharyngeal & hypoglossal nerves.

