Development and teratology of the endocrine system and pharyngeal apparatus of the embryo

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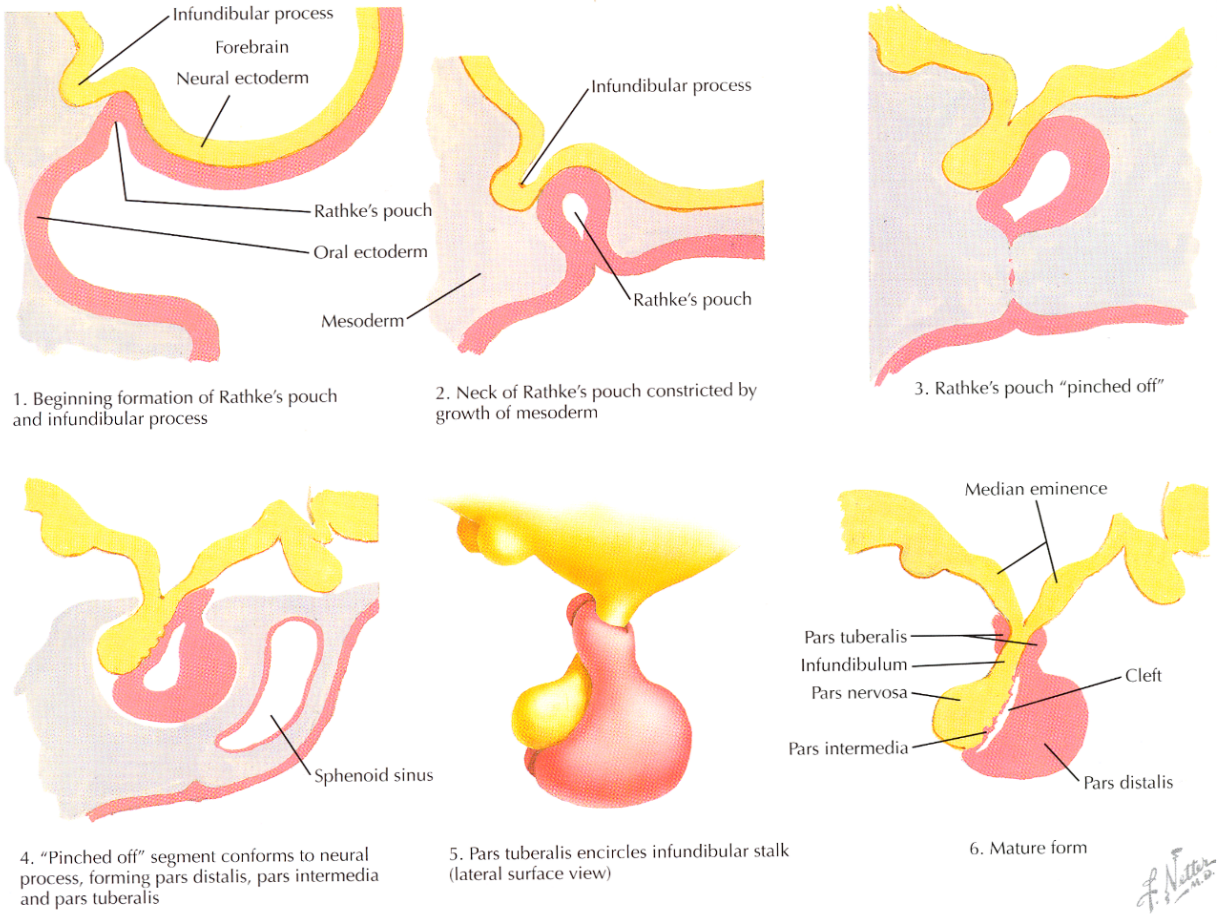
15.5.2023

Pituitary gland

- Ectoderm (Rathke's pouch)
- Neuroectoderm of ventral wall of diencephalon



Development of the Hypophysis

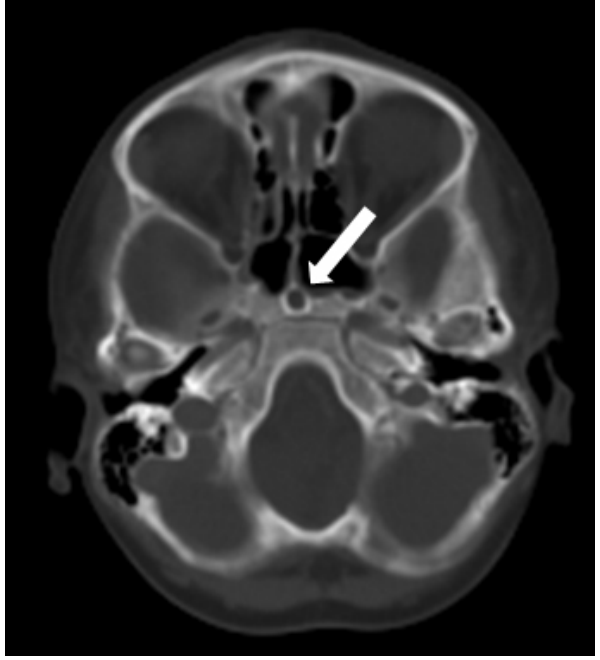
Craniopharyngeal canal

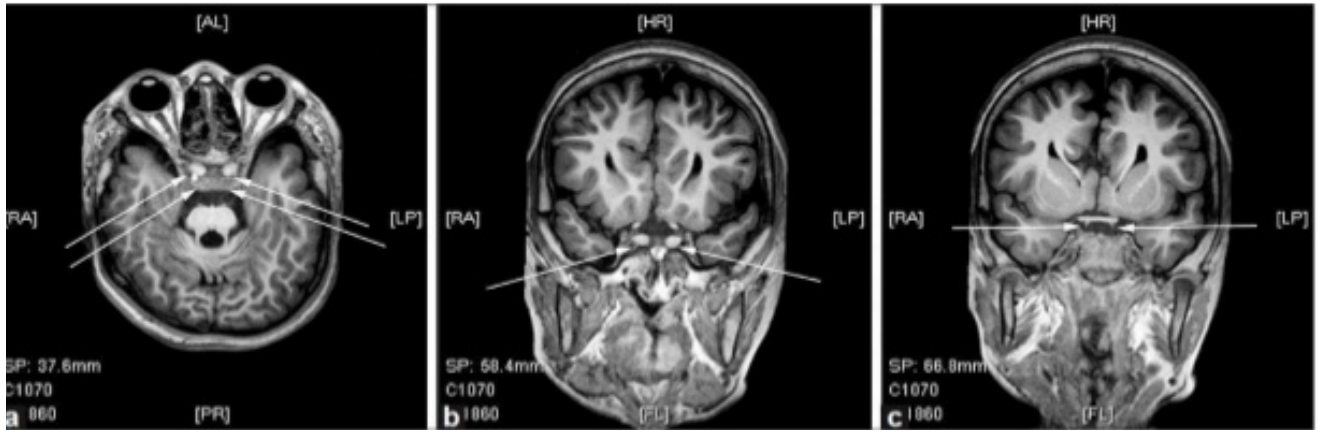
Pharyngeal hypophysis

Agenesis/hypoplasia - agenesis is incompatible with life; panhypopituitarism

Duplication of the gland – very rare

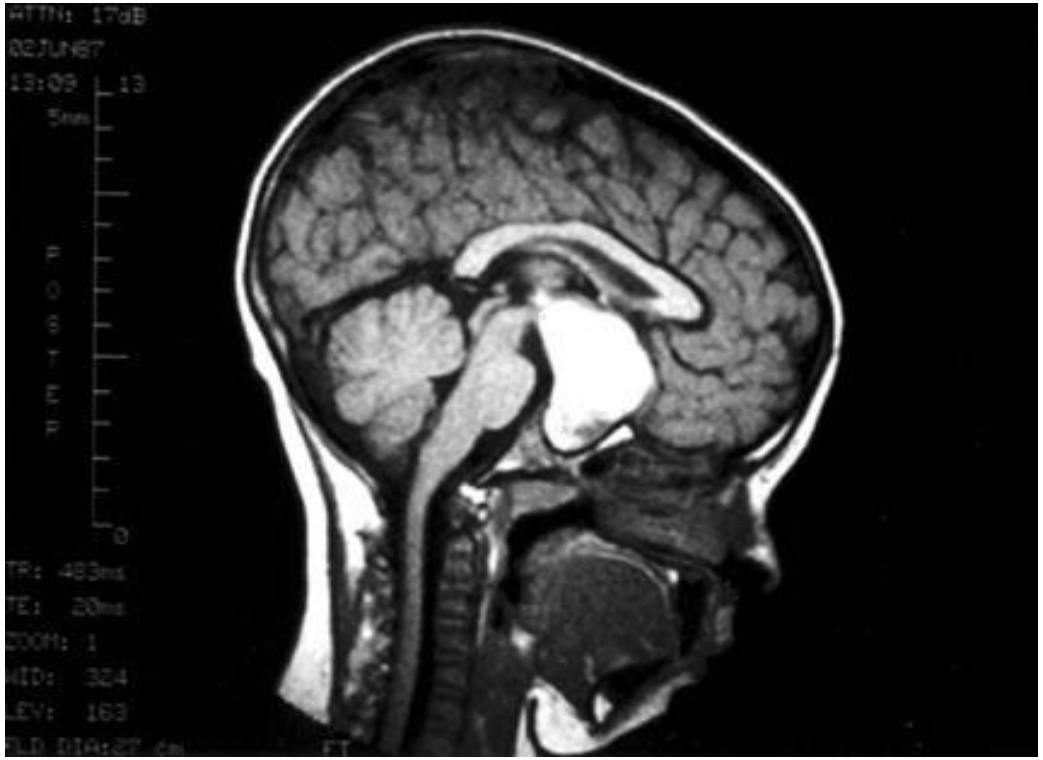
Ectopic posterior pituitary – pituitary dwarfism





Duplication of the pituitary gland associated with multiple blastogenesis defects: Duplication of the pituitary gland (DPG)-plus syndrome. Case report and review of literature - Surgical Neurology International

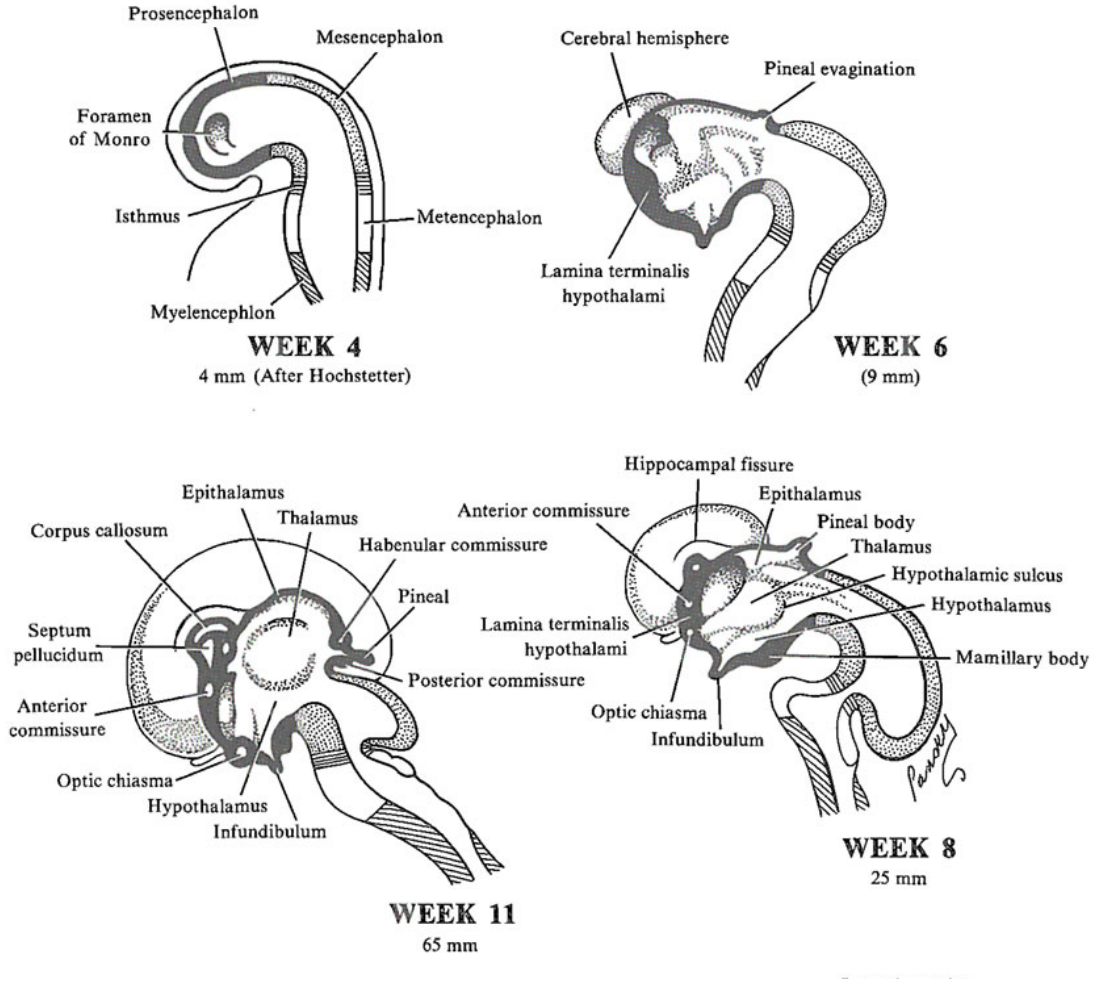
Craniopharyngiomas – usually lie above the sella; cause hydrocephalus, growth failure, diabetes insipidus, lose of peripheral vision



Pediatric Craniopharyngioma: Background, Pathophysiology, Epidemiology (medscape.com)

Epiphysis

- thickening of caudal part of ependyma that does not contribute to development of choroid plexus at the roof of diencephalon
- neuroectoderm



Pineal gland agenesis – mutations PAX6 (paired box gene 6)

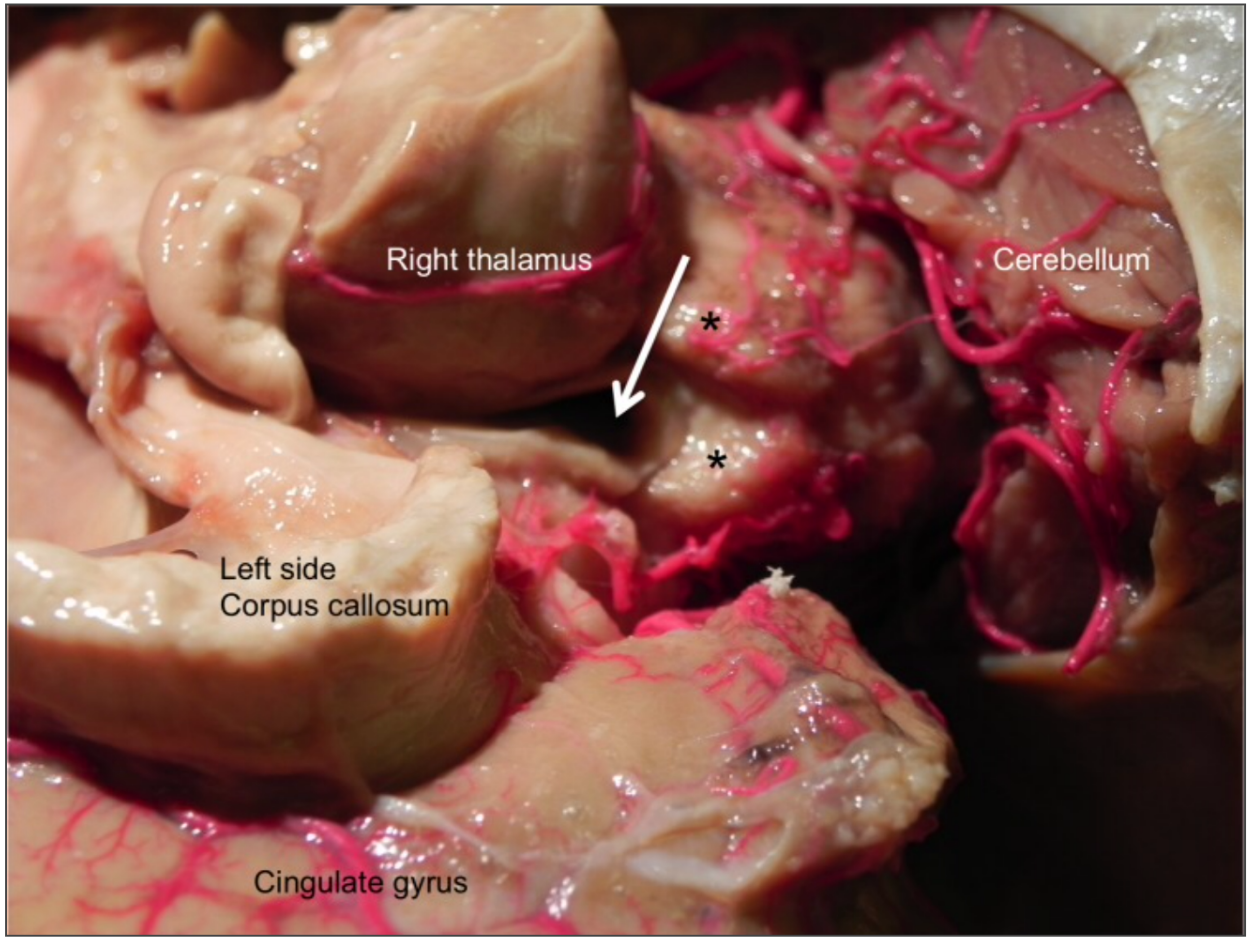


Figure 1

Absent Pineal Gland

Cureus | Pineal Gland Agenesis: Review and Case Illustration

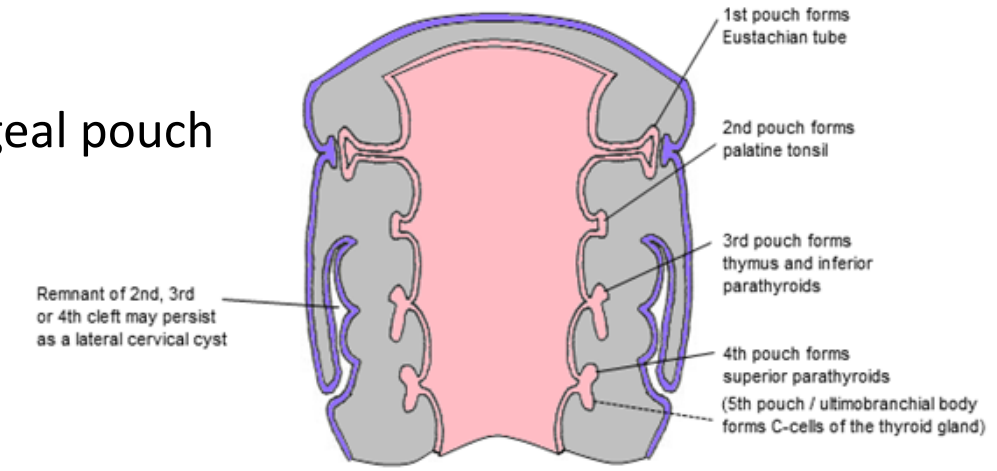
Thyroid gland

- endodermal proliferation of pharyngeal floor between tuberculum impar and copula

- obliterating ductus thyreoglossus
- foramen caecum

- bilobed diverticulum
- lobus pyramidalis

- C-cells
- neural crest origin
- ultimobranchial body of 5th pharyngeal pouch



Pyramidal lobe – in 50 % of population

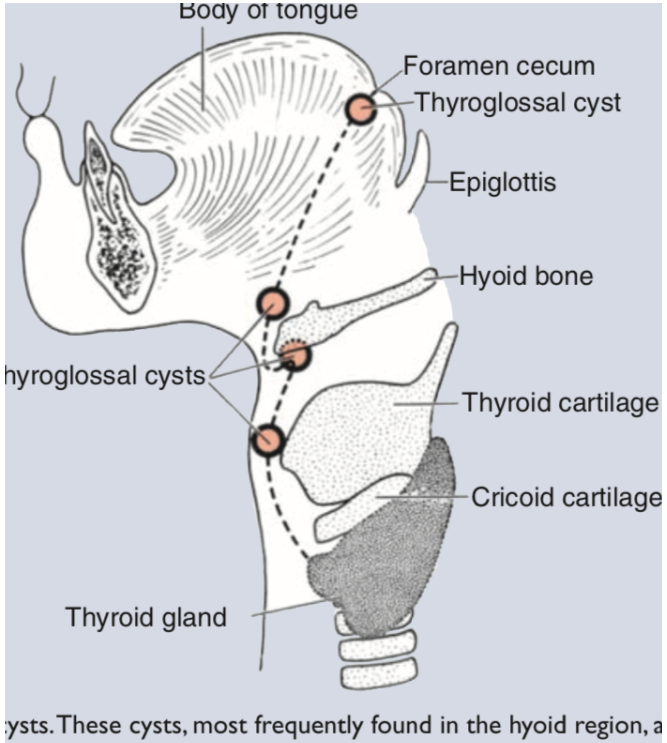
Congenital hypothyroidism (1/3000)

- ectopic thyroid
- hypoplasia, agenesis
- TSH deficiency

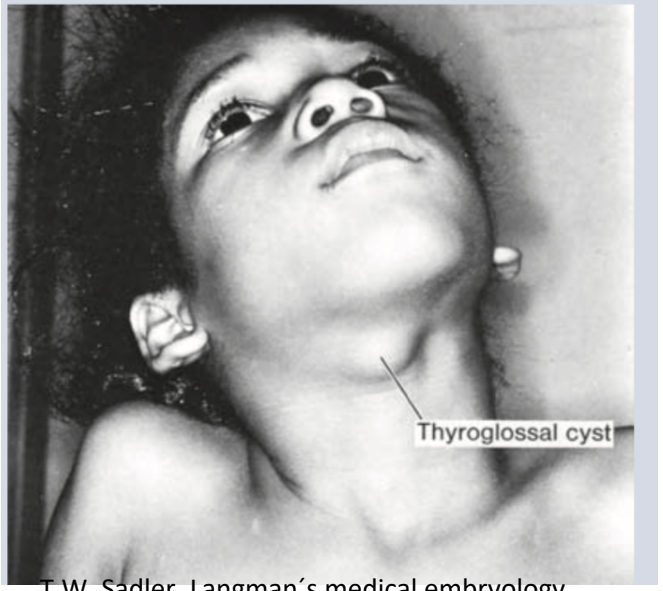
Ectopic thyroid gland – in 90 % cases it is lingual thyroid gland; sublingual thyroid gland

Thyroglossal duct cyst – clinica important to distinguish from ectopic thyroid gland!

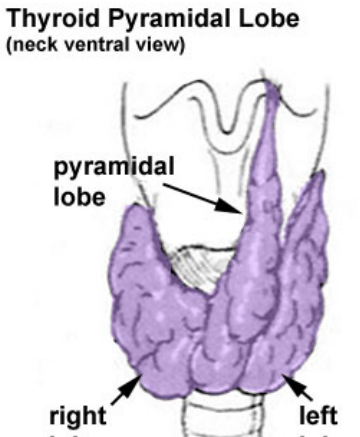
Thyroglossal fistula



ysts. These cysts, most frequently found in the hyoid region, a

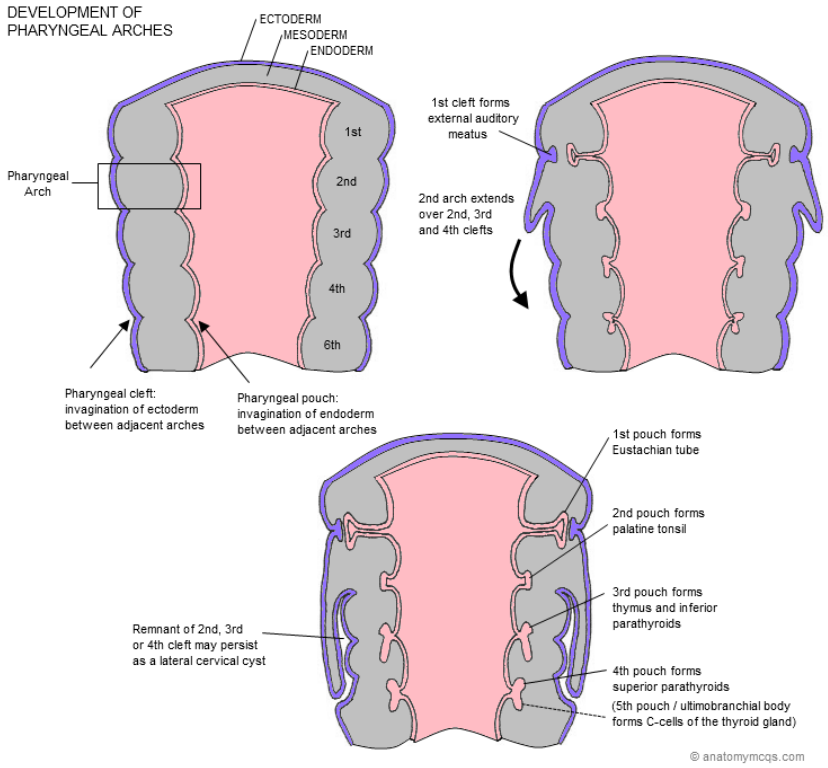


T.W. Sadler, Langman´s medical embryology, 12th edition



Embryonic development of parathyroid gland

- glandulae parathyroideae superiores from endoderm of 4th pharyngeal pouch
- glandulae parathyroideae inferiores from dorsal process of 3rd pharyngeal pouch
- together with thymus descend to lower poles of thyroid



Ectopic parathyroid tissue –
the inferior parathyroids are more variable in their position
Supranumerary parathyroid glands

Suprarenal gland

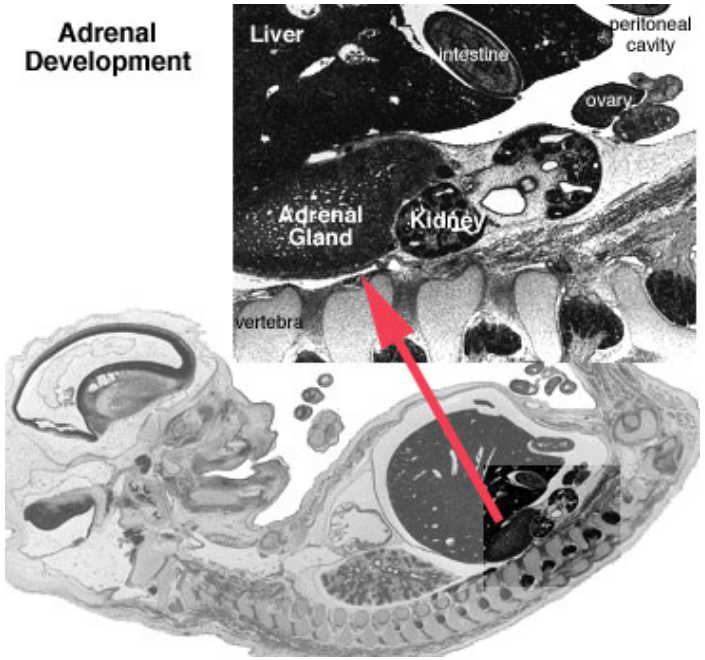
Cortex

- Mesoderm ---> coelomic epithelium
- primitive fetal cortex 5-6th week

- definitive cortex
- zona reticularis fully differentiates within 3 years

Medulla

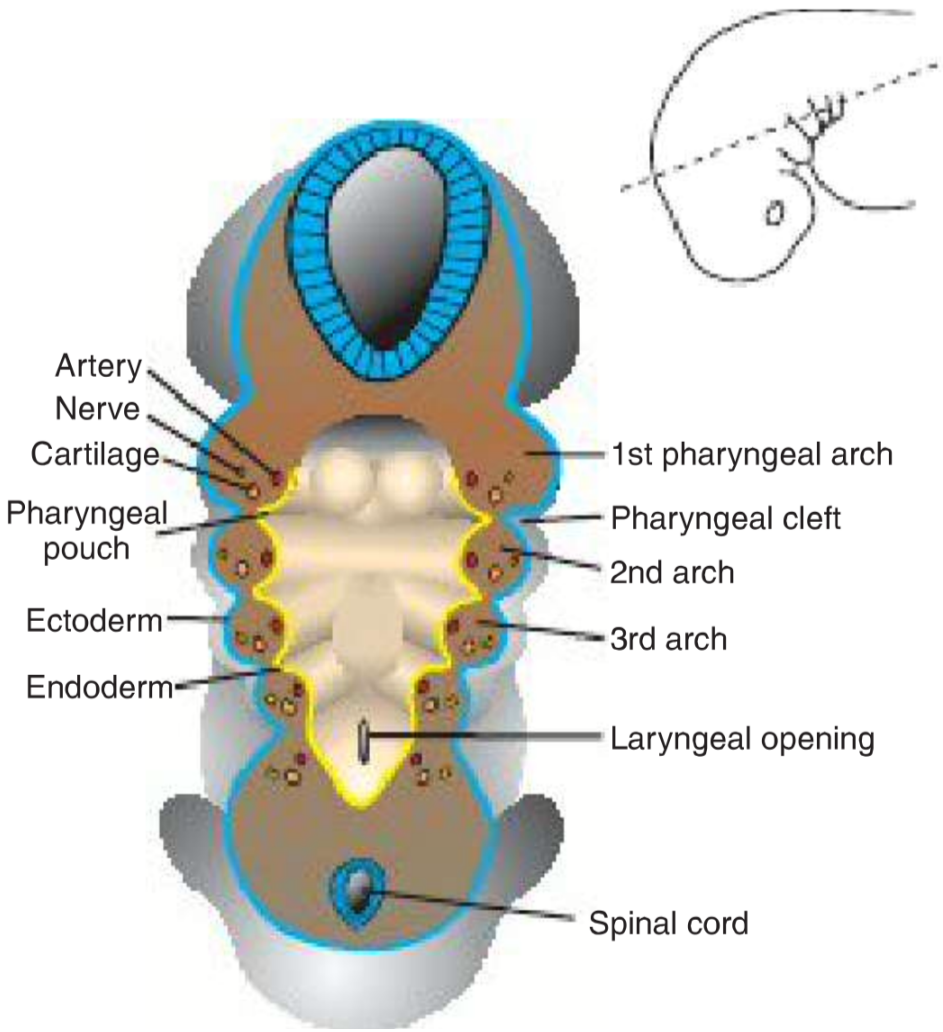
- neural crest

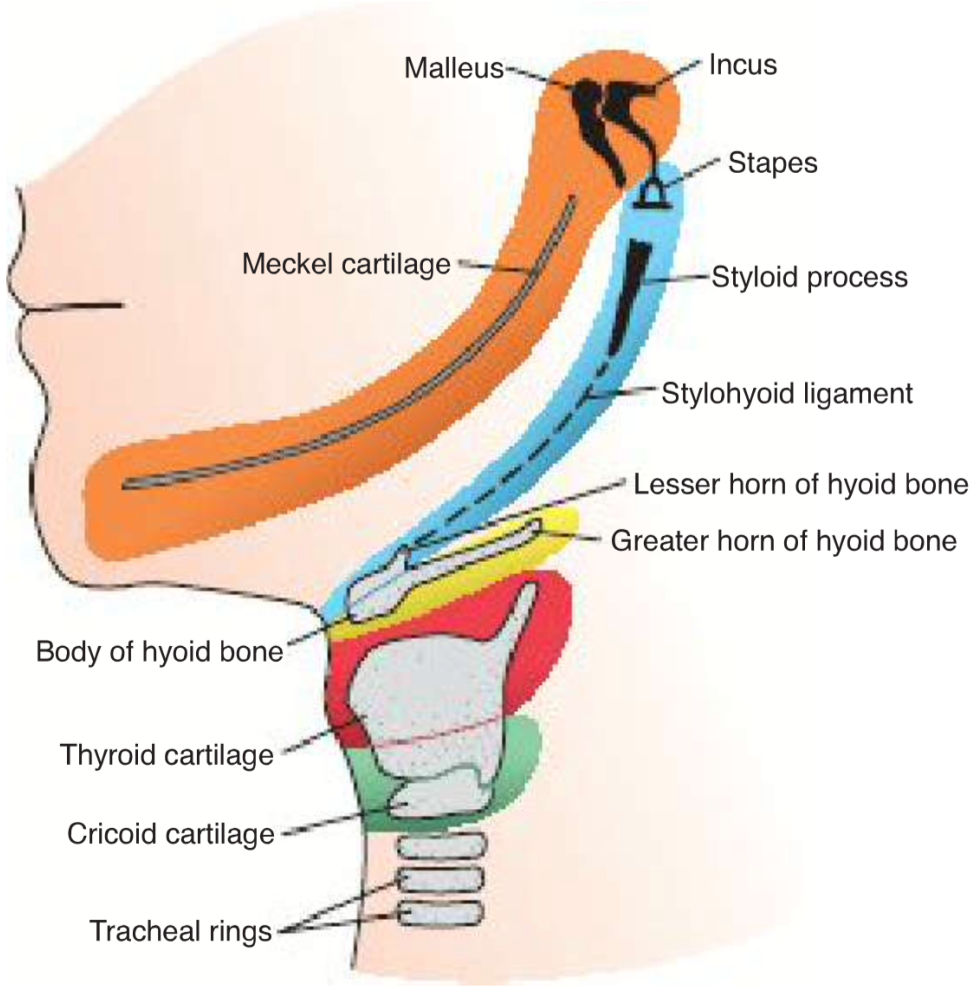


Week10 adrenal - Endocrine - Adrenal Development - Embryology (unsw.edu.au)

Congenital adrenal hyperplasia – group of autosomal recessive disorders – excessive production of androgenes: causes rapid growth and accelerated sceletal maturation in both sexes

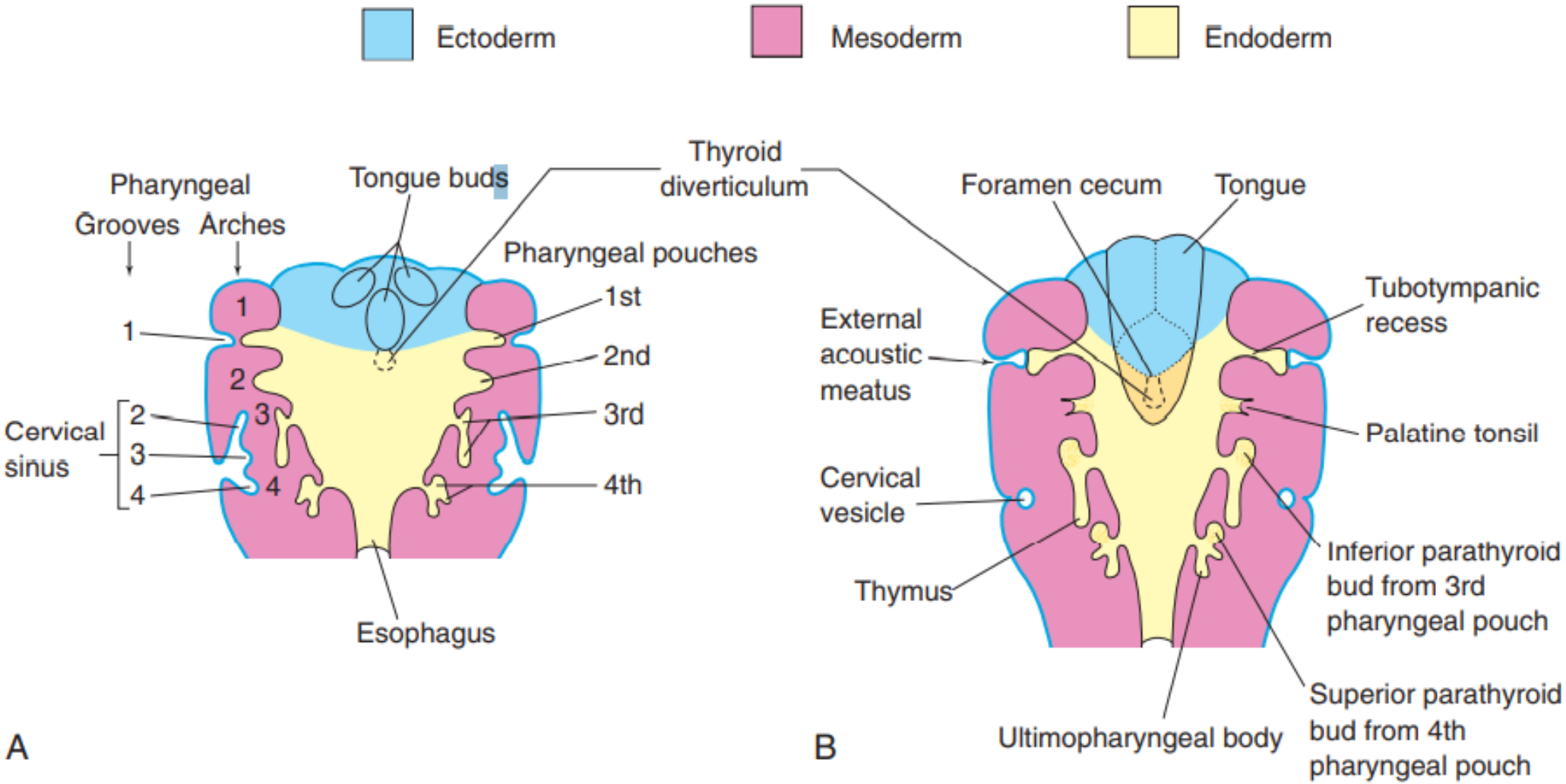
Neck region





T.W. Sadler, Langman´s medical embryology, 14th edition

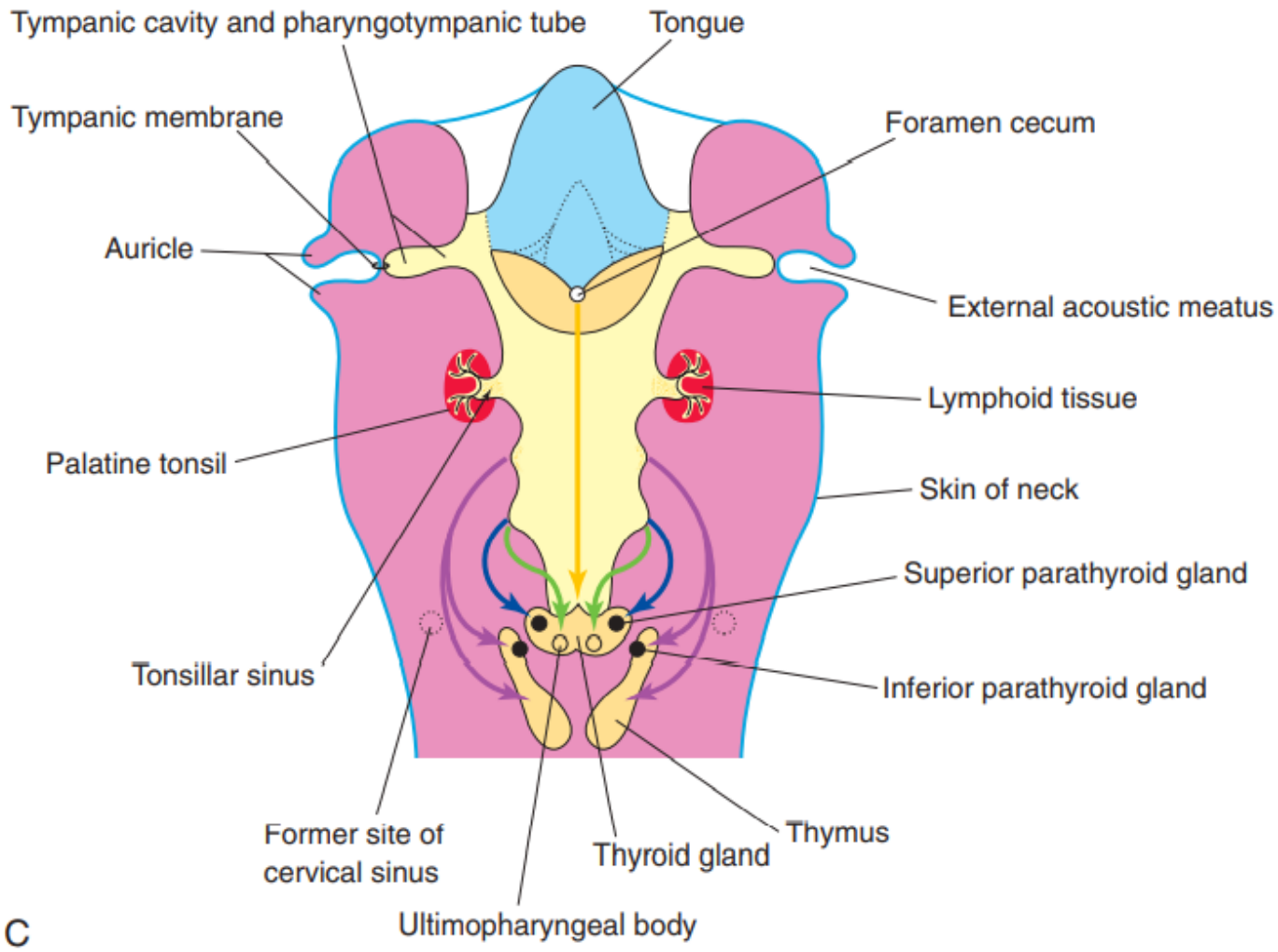
Neck region – pharyngeal apparatus



K. Moor, Before we are born, 9th edition

Ectopic thymic tissue
Ectopic parathyroid tissue

Branchial fistulas: external and internal
Cervical cysts



K. Moor, Before we are born, 9th edition

Craniofacial defects associated with neural crest cells

- Mandibulofacial dysostosis – Treacher Collins syndrome: autosomal dominant, 1/50000
- Robin sequence: first-arch structures, 1/8500 – micrognatia, cleft palate and glossoptosis
- 22q11.2 deletion syndromes: DiGeorge syndrome, DiGeorge anomaly, velocardiofacial syndrome etc. - 1/4000
- Hemifacial microsomia (oculoauriculovertebral spectrum – Goldenhar syndrome) – 1/5600, assymetry in 65% cases; involves maxillary, temporal, zygomatic bones, ears, eyes, vertebrae. Cardiac deffects in 50% cases.

https://economictimes.indiatimes.com/magazines/panache/man-born-with-treacher-collins-syndrome-was-rejected-by-biological-parents-36-hrs-after-birth-for-his-face-but-his-adoptive-mom-didnt-care/articleshow/93541374.cms?from=mdr