The Larynx and Ear

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Cartilages

- Thyroid: (shield), C4-C5 hyaline, 90° male
  120° female
- Cricoid: C6, hyaline
- Triticeal
- Epiglottis: extends to C3, elastic
- Cuneiform: elastic, does not contact other cartilages
- Corniculate: limited function in man, elastic
- Arytenoid: ½ elastic ½ hyaline
- By ~age 65 thyroid, cricoid and ½ arytenoid are ossified
- Quadrangular membrane: submucosal sheet of connective tissue
- Its free inferior margin = vestibular fold
- Its free superior margin = aryepiglottic fold
- Conus elasticus: median cricothyroid ligament, vocal ligament, and cricovocal membrane
Spaces

- Three regions: vestibule (superior to false folds), ventricle (between false above true), infraglottic (folds to cricoid)
- Rima (slit) glottidis between true folds
- Saccule (appendix)
Rima Glottidis

Intermembranous

Intercartilaginous
Laryngeal Innervation
Muscles

- Extrinsic: suprahyoid and infrahyoid
- Intrinsic:
Most Important Muscle in the Body?
- Adductors: lateral (antagonist to PCA), cricoarytenoid, transverse arytenoid
- Tensor: cricothyroid
- Relaxer: thyroarytenoid
- Tensor/Relaxer: vocalis
- Sphincters: transverse, oblique arytenoid, aryepiglottic muscles
Vocal ligament before (a) and after (b) depression of thyroid cartilage
Laryngeal Vessels

- Superior laryngeal artery (STA)
- Cricothyroid artery (STA)
- Inferior laryngeal artery (inferior thyroid)
- Deep lymphatic chain superior to cords
- Pre and paratracheal lymph nodes inferior to cords
- No communication across the midline
Auricle (Pinna)
EAM Innervation

- **Anterior:** auriculotemporal nerve
- **Posterior:** CN X with some CN IX/CN VII
- **Reflexes:** bradycardic, cough, emesis
- **Dentally referred otalgia**
EAM

- Length: adults ~3 cm, children ~1 cm
- Medial 2/3 bony; lateral part elastic cartilage
- Lined with skin
- **External:** auriculotemporal, X, ?VII, ?IX
- **Internal:** tympanic plexus, VII (chorda tympani)
Middle Ear Features

- Ossicles (covered with mucous membrane not periosteum)
- Stapedius and tensor tympani
- Chorda tympani
- Tympanic plexus
- Roof: tegmen tympani
- Lateral: tympanic membrane
- Medial: inner ear (promontory of cochlea; aka labyrinthine wall), facial nerve
- Posterior wall = aditus
- Anterior wall = ET, canal of tensor tympani, ICA
- IJ (superior bulb) in floor of middle ear
- ICA in anterior wall of middle ear
Stapedius

- Inserts into the neck of stapes
- Function
- Hyperacusis
Tensor Tympani

- Superior surface of cartilaginous ET, > wing of sphenoid, petrous part of temporal bone
- Inserts into handle of malleus
- Function
- ?Continuation of tensor veli palatini
processus cochleariformis
Tympanic Plexus

- Tympanic nerve (Jacobson)
- Caroticotympanic
- ? Facial nerve contribution
- Supplies mucosa of tympanic cavity, ET, mastoid cells
Chorda Tympani

- 5 mm superior to SM foramen enters posterior iter
- From posterior iter into middle ear
- Enters anterior iter then leaves via petrotympanic fissure
Eustachian Tube

- Posterolateral 1/3 is bony
Bony Labyrinth x 3: Perilymph

oval window / fenestra vestibuli

round window / fenestra cochlea

vestibule
Membranous Labyrinth: Endolymph

- Cochlear duct
- Semicircular ducts
- Utricle and saccule (within vestibule)