HUMAN FUNCTIONAL ANATOMY 213
MOUTH AND MASTICATION

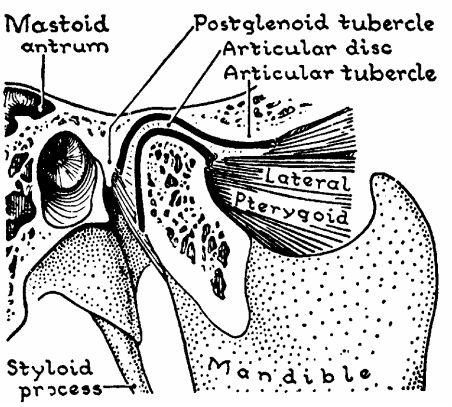
THIS WEEKS LAB:
Mouth and Mastication.

READINGS
Faiz and Moffat: mouth, palate and nose section 66
Stern: sections 45, 63 and 64
Grant's Method:- Parotid, temporal and infratemporal regions
& Mouth tongue and teeth

IN THIS LECTURE I WILL COVER:
Temporomandibular Joint
Movements and muscles of mastication
Comparative anatomy of mastication
Tongue
Nerve supply to the mouth
- General sensory
- Taste
- Parasympathetic

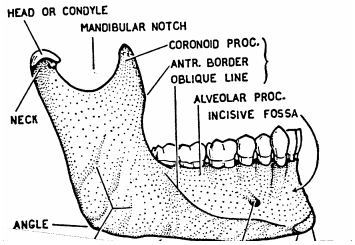
TEMPOROMANDIBULAR JOINT

Temporal bone
Articular eminence
Mandibular fossa
(Tympanic, petrous and squamous parts)
Postglenoid tubercle



Mandible
Condylar process (head)
Neck

Coronoid process
Intra-articular disc



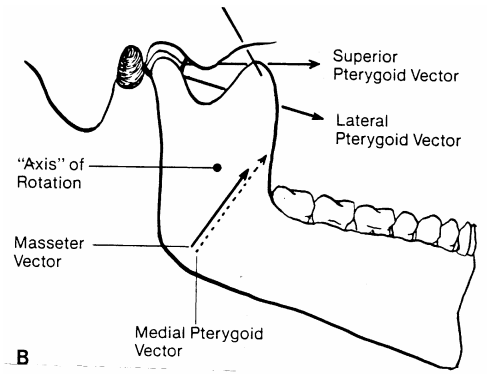
Intra-articular disc
Fits over the head of the mandible
Attaches all the way around to the joint capsule (divides the joint cavity into upper and lower parts)

Joint capsule
Thin except laterally where there is a strong ligament

MOVEMENTS OF THE TEMPOROMANDIBULAR JOINT

Movements above the intra-articular disc
The disc and the condyle slide forwards onto the articular eminence
- Protraction
- Retraction

Movements below the intra-articular disc
The condyle rotates within the socket formed by the intra-articular disc
- Elevation
- Depression



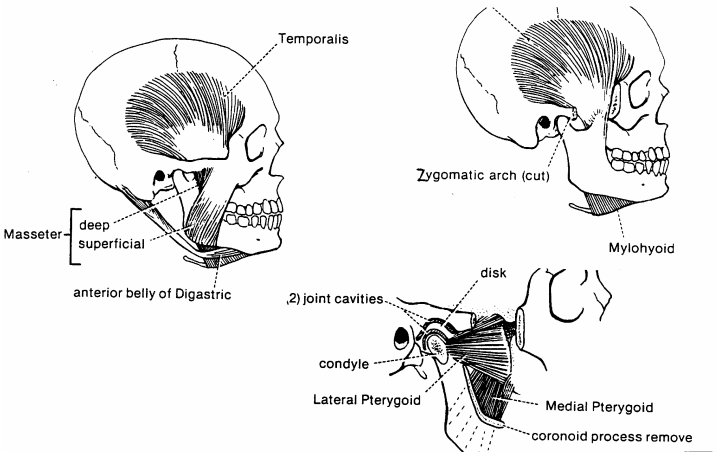
Combined movement
Works about an axis half way down the ramus of the mandible
As the jaw opens the head slides forwards onto the articular eminence

Alternating protraction / retraction
If one side protracts while the other side retracts you can chew and grind
This is essential for mammals in general but herbivores in particular

MUSCLES OF MASTICATION

All supplied by the mandibular division of the Trigeminal nerve
Temporalis: Temporal fossa to Coronoid process => elevate & retract
Masseter: Angle of the mandible to the zygomatic arch => elevator
Medial pterygoid: Inside angle of mandible to medial side of lateral pterygoid plate => elevator

Lateral pterygoid: Neck and intra-articular disc to the lateral side of the lateral pterygoid plate => protractor



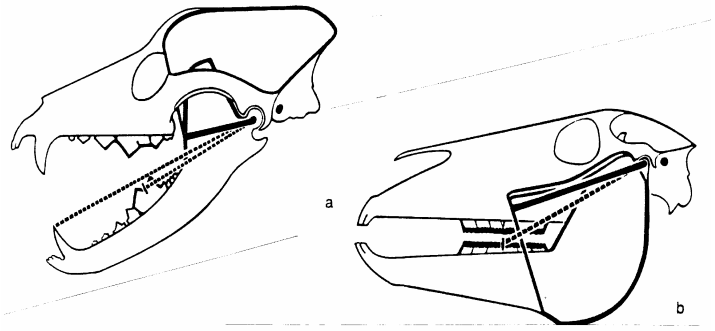
Additional muscles (of mastication?) supplied by trigeminal nerve
Anterior belly of digastric
Mylohyoid
Tensor tympani (attaches to the malleus - 1st arch bone - part of the reptilian jaw joint)
Tensor palati

MASTICATION
COMPARATIVE ANATOMY

Non mammals use their mouth to capture food which they swallow whole
Mammals chew their food and require a different kind of TMJ

Different mastication in mammals
Carnivores capture their food. (afterwards meat is fairly easy to chew)
Need a wide gape and jaws built for speed
Low ramus shortens muscle lever arms
Long teeth lever arm

Large temporalis muscle / Small masseter

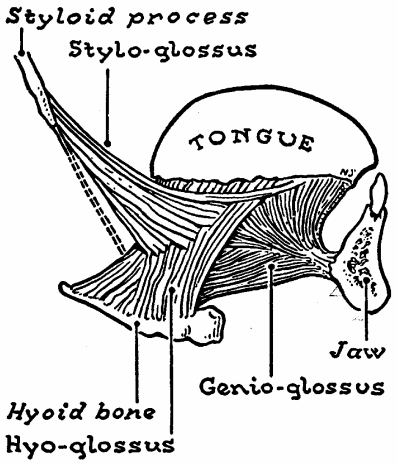


Herbivores have to thoroughly chew their tough food
Need jaws built for grinding power
High ramus lengthens masseter lever arm
Short tooth lever arm
Large masseter muscle / Small temporalis

THE TONGUE

Develops from occipital somites => Hypoglossal nerve (motor)
Sensory supply via the lingual branch of the trigeminal
Intrinsic muscles:
In the substance of the tongue (Alter the shape of the tongue)
Vertical
Transverse
Longitudinal bundles
Extrinsic muscles
Attach outside the tongue (Alter the position of the tongue)

Genioglossus
Hyoglossus
Styloglossus
Palatoglossus



All supplied by the hypoglossal nerve (except palatoglossus, which must be considered as a palatine muscle supplied by the Vagus CN10)

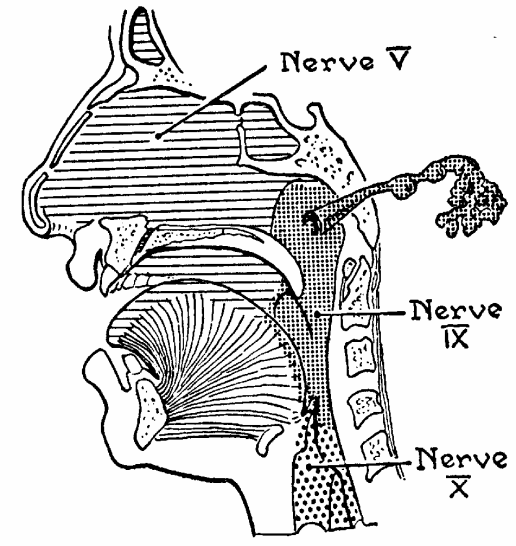
NERVE SUPPLY OF THE MOUTH, NOSE AND PHARYNX

GENERAL SENSORY

Trigeminal	**Mouth**
	Nose
	Meninges

(Ophthalmic, Maxillary and Mandibular divisions)

Glossopharyngeal nerve	**Pharynx**
Vagus nerve	**Larynx**



NERVE SUPPLY OF THE MOUTH

TASTE AND PARASYMPATHETIC
Taste buds are found on the tongue but also throughout the mouth
Parasympathetic nerves supply salivary glands and oral mucosa.

ROOF OF MOUTH (Maxillary process of 1st arch)
Taste buds in the palate and mucosa of nose and palate
Greater petrosal nerve (from the facial nerve)
Parasympathetic fibres synapse in the **pterygopalatine ganglion**.
Taste fibres have a sensory **geniculate ganglion** on the facial nerve
BOTH are distributed with branches of the maxillary nerve:
Greater and lesser palatine, nasopalatine, and nasal branches

FLOOR OF MOUTH (Mandibular process of 1st arch)
Taste buds in the tongue, salivary glands and oral mucosa
Chorda tympani (from the facial nerve)
Parasympathetic fibres synapse in the **submandibular ganglion**.
Taste fibres (anterior 2/3 of tongue) also use the **geniculate ganglion**
BOTH are distributed with branches of the lingual nerve
But buccal glands must receive their supply via the buccal branch of the mandibular

BACK OF THE TONGUE (Pharynx = Glossopharyngeal nerve)
General sensory & taste to the pharynx (inc. posterior 2/3 or tongue)
Parasympathetic (lesser petrosal nerve, otic ganglion, branches of mandibular nerve) to parotid (and buccal) gland