

PAROTID AND INFRATEMPORAL REGIONS

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I. **TEMPORAL FOSSA** - between superior temporal line (superiorly) and zygomatic arch (inferiorly); contains: Temporalis muscle, Deep Temporal nerves and arteries, branches of Superficial Temporal artery; Auriculotemporal nerve to overlying skin.

II. **INFRATEMPORAL FOSSA** - Boundaries - superior: Greater wing of Sphenoid bone zygomatic arch; lateral: ramus of Mandible; medial: Lateral Pterygoid plate; anterior: Maxillary bone.

III. **MAXILLARY ARTERY** - Terminal branch of External Carotid artery; Arises posterior to neck of mandible (embedded in parotid gland); Three parts: First part posterior and medial to neck of mandible; Second part superficial to or within Lat. Pterygoid muscle; Third part within Pterygopalatine Fossa; Branches - branches of first and third parts pass through foramina.

* - **CLINICALLY IMPORTANT BRANCHES**

| ARTERY | FORAMEN | STRUCTURES SUPPLIED |
|--|---|---|
| First part - posterior and medial to neck of mandible | | |
| 1. Deep Auricular Artery | External Auditory Meatus | Outer Ear, Tympanic Membrane |
| <u>2. Anterior Tympanic Artery *</u> | <u>Petrotympanic Fissure</u> | <u>Middle Ear</u> |
| <u>3. Middle Meningeal Artery*</u> | <u>Foramen Spinosum</u> | <u>Calvarium, Middle Cranial Fossa</u> |
| <u>(4. Accessory Meningeal A.)*</u> | <u>Foramen Ovale</u> | <u>Calvarium, Middle Cranial Fossa</u> |
| <u>5. Inferior Alveolar Artery*</u> | <u>Mandibular Foramen</u> | <u>Mandibular teeth; branch - Mental A. to chin</u> |
| Second part - superficial to or within Lateral Pterygoid muscle | | |
| 1. Deep Temporal Artery | ----- | Temporalis muscle |
| 2. Pterygoid Arteries | ----- | Med. and Lat. Pterygoid m. |
| 3. Masseteric Artery | ----- | Masseter |
| 4. Buccal Artery | ----- | over Buccinator to Cheek |
| Third part - within Pterygopalatine fossa | | |
| <u>1. Post. Superior Alveolar Artery*</u> | <u>Post. Sup. Alveolar Foramen</u> | <u>Posterior Maxillary Teeth</u> |
| <u>2. Descending Palatine Artery*</u> | <u>Greater and Lesser Palatine Foramina</u> | <u>Hard and Soft Palate</u> |
| <u>3. Artery of Pterygoid Canal</u> | <u>Pterygoid Canal</u> | <u>Upper pharynx, Auditory tube</u> |
| <u>4. Sphenopalatine Artery*</u> | <u>Sphenopalatine Foramen</u> | <u>Nasal Cavity, Palate</u> |
| <u>5. Infraorbital Artery*</u> | <u>Infraorbital Foramen</u> | <u>Skin below orbit; branches: Anterior Maxillary Teeth</u> |

Clinical Note: Cannot ligate Maxillary artery - Maxillary artery is major source of blood supply for nasal cavity, middle ear, calvarium, oral cavity (teeth); cannot effectively ligate artery medial to mandible; bleeding treated by cauterly (ex. nosebleed - epistaxis)

A. Note: Foramina of Infratemporal Fossa - Foramen Ovale - for V3 and Accessory Meningeal artery; Foramen Spinosum - for Middle meningeal artery and Nervous Spinosus; Mandibular foramen for Inferior alveolar nerve, artery, vein; Pterygomaxillary fissure - for Maxillary artery and branches of Maxillary nerve (V2).

B. Note: Contents of Infratemporal Fossa - Medial and Lateral Pterygoid muscles; branches of V3 (Mandibular division of Trigeminal nerve); branches of Maxillary artery; Pterygoid venous plexus.

IV. **PTERYGOID VENOUS PLEXUS** - veins (venae comitantes) accompany branches of maxillary artery; have same names; drain to pterygoid venous plexus (superficial to Lateral pterygoid muscle); plexus has anastomoses with facial vein and cavernous sinus (by veins following Middle Meningeal a.).

Clinical Note: Pterygoid venous plexus has anastomoses with veins that drain to Cavernous Sinus; **Infections can spread from teeth, nasal cavity, palate, etc. to brain** (similar to anastomoses of Facial Vein).

V. **TEMPORO-MANDIBULAR JOINT (TMJ)** - synovial joint between head of mandible and mandibular fossa of temporal bone; articular tubercle is anterior to fossa.

A. Capsule surrounds joint - is attached tightly to head of mandible, loosely to temporal bone.

B. Articular disc - cartilaginous disc divides joint into two compartments; hinge movements occur in lower compartment; sliding movements in upper compartment.

Clinical Note: TMJ Jaw Lock - in sliding movements, articular disc moves with head of mandible; disc can get stuck on zygomatic arch and jaw 'locked' open (held open by **articular tubercle**)

C. Ligaments

1. Major ligament - Temporomandibular (Lateral) Ligament - thickening of joint capsule on lateral side; prevents movement posteriorly and inferiorly.

2. Other ligaments - functions unclear: a. Sphenomandibular Ligament - attached to spine of sphenoid and lingula of mandible; Stylomandibular Ligament - attached to styloid process and posterior border of mandible.

D. Movements

1. Depression-elevation (opening and closing mouth) - first part hinge movement in lower compartment; second part sliding in upper compartment.

2. Protrusion-retrusion (anterior-posterior) movements - occur as sliding movements in upper compartment.

3. Lateral movements - sliding movements in upper compartment.

VI. MUSCLES OF MASTICATION

| MUSCLE | ORIGIN | INSERTION | ACTION | NERVE |
|-------------------|--|--|-----------------------------------|-------|
| Masseter | Zygomatic arch | Mandible - lateral side of ramus | Elevate mandible | V3 |
| Temporalis | Temporal bone | Mandible - coronoid process | Elevate, retrude mandible | V3 |
| Medial Pterygoid | Lateral pterygoid plate - medial side | Mandible - medial side of ramus | Elevate mandible | V3 |
| Lateral Pterygoid | 1) Sphenoid bone - Greater wing 2) Lateral pterygoid plate - lateral side | 1) Mandible - neck 2) Articular disc of TMJ | Depress, protrude mandible | V3 |

Clinical Note: Lateral Pterygoid is attached to and moves articular disc of TMJ anteriorly when opening mouth. Malfunction of Lateral Pterygoid can contribute to TMJ problems.

Anatomical Note: Lateral movements - Lateral movements of the jaw occur in chewing. **Masseter and Temporalis** (outside the mandible) pull the **jaw toward the same side**; **Medial and Lateral Pterygoid muscles** (inside the mandible) pull the **jaw toward the opposite side**.

Clinical Note: Damage to Trigeminal Nerve (CN V) - Jaw deviates **TOWARD paralyzed side** (patient opens mouth); unopposed action of Lateral Pterygoid muscle of intact side

VII. **PAROTID REGION** - area between mastoid process and ramus of mandible occupied by parotid gland.

A. Development of Parotid gland - develops from buds that arise from ectodermal lining of primitive mouth; buds branch to form solid cords; cords develop lumens to form ducts; ducts join.

Note: can have Accessory Parotid glands if ducts join incompletely; no clinical consequence.

B. Capsule - gland is enclosed in a dense fibrous capsule derived from investing layer of deep cervical fascia; capsule is attached superiorly to zygomatic arch and tympanic part of temporal bone.

Clinical Note: Mumps is a viral infection that causes swelling of the parotid gland; may be quite **painful due to tightness of capsule** surrounding parotid; similar pain in carcinoma of parotid

C. Parotid duct - passes superficial to masseter muscle to pierce buccinator opposite maxillary second molar tooth.

Note: Parotid duct makes a 90 degree turn when entering buccinator; this turn acts as a passive valve that prevents air from entering parotid duct when using cheeks to increase pressure in oral cavity, as when blowing a balloon.

D. Structures within parotid (superficial to deep) - Facial nerve and its terminal branches; Retromandibular vein; External Carotid artery and its terminal branches; Auriculotemporal nerve; parotid lymph nodes.

Clinical Note: Referred pain (Ear ache) from Parotid - When parotid swells during mumps or in parotid tumor, **pain is often referred to outer ear** and temporal region due to **compression of Auriculotemporal nerve**.

E. Nerve supply - Visceral Motor (Parasympathetic) fibers from Glossopharyngeal nerve (Otic ganglion).