MED437
KING SAUD UNIVERSITY

Revised By
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ANATOMY
Team 437

Anatomy of Salivary Glands

Lecture (2)

- Important
- Doctors Notes
- Notes/Extra explanation

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

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هذا العمل مبني بشكل أساسي على عمل دفعة ٤٣٦ مع المراجعة
والتدقيق وإضافة الملاحظات ولا يغني عن المصدر الأساسي للمذاكرة

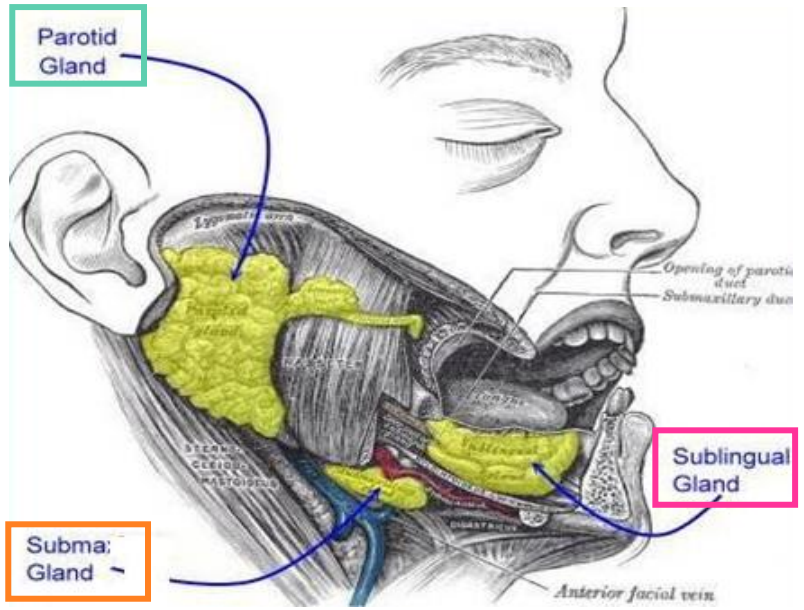
Objectives

By the end of this lecture the student should be able to:

- ✓ Describe the anatomy of the *parotid* gland: position, shape, structures within it , innervation and parotid duct.
- ✓ Describe the anatomy of the submandibular and sublingual salivary glands: location, shape, parts, ducts and innervation of the glands.

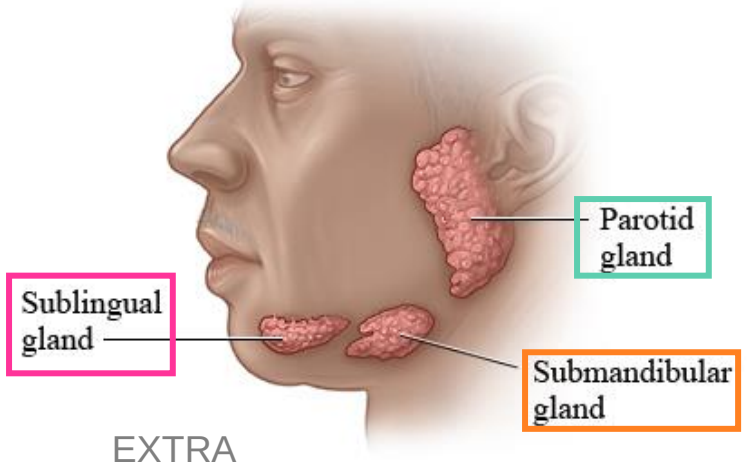
Salivary glands

- Are exocrine glands, that produce saliva.
- There are **3 large named pairs** of salivary glands and multiple minute unnamed glands in the submucosa of the oral cavity (lips, palate & under surface of the tongue).



The three NAMED PAIRS are:

Parotid(biggest):	produces a serous watery secretion.
Submandibular:	produces a mixed serous & mucous secretion.
Sublingual:	secretes saliva that is predominantly mucous in character.



EXTRA

Parotid gland

- It is the largest salivary gland formed entirely of **serous** acini.
- It has 3 surfaces :

1- Superficial 2- Anteromedial 3- Posteromedial

- Accessory part:

A small part that is separated from the main gland.

- Capsule of the parotid gland: tight, derived from cervical fascia of the neck.

We have:
True capsule → from the fibrous tissue of the gland
False capsule → from deep cervical fascia

Position: Gland wedged between

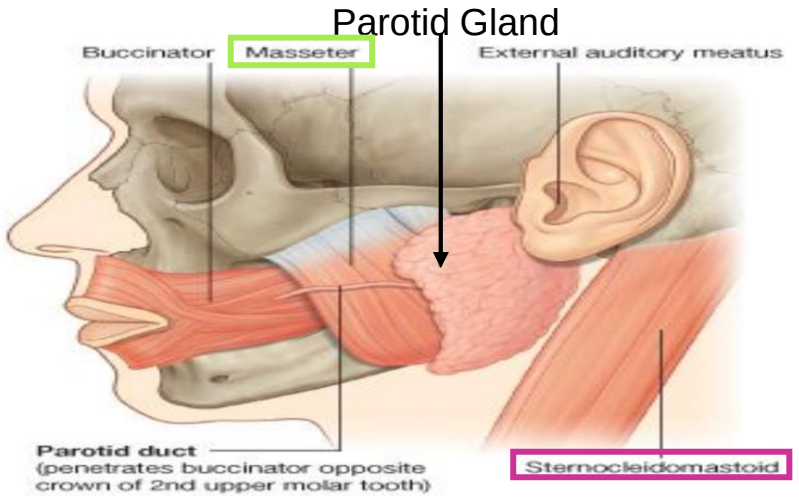
- Anteriorly: mandibular ramus & masseter + medial pterygoid (the parotid gland is **behind** them)

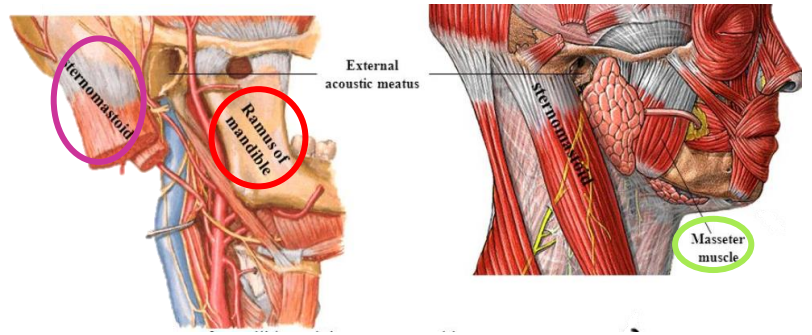
هي تكون في الوسط وفوقها شيء وتحتها شيء زي السندويتس

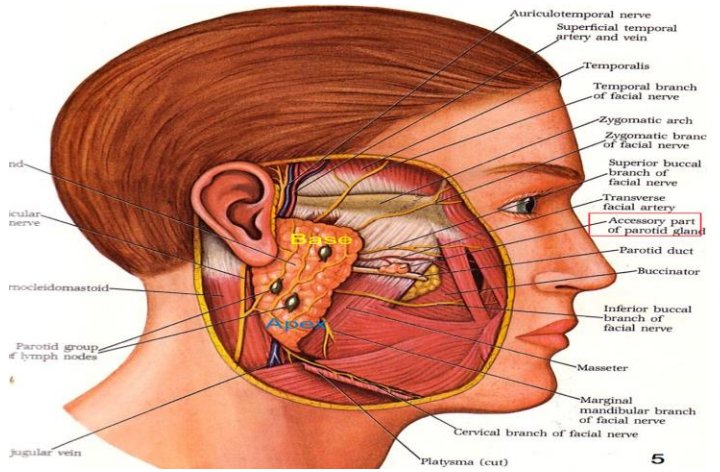
- Posteriorly: Mastoid process & sternomastoid muscle + posterior belly of digastric (the parotid gland is **in front of** them)

Shape: Triangular and has:

- Apex (lower end): behind angle of the mandible
- Base (concave upper end): directed upward just below the zygomatic arch, external auditory meatus &TMJ. (temporomandibular joint).

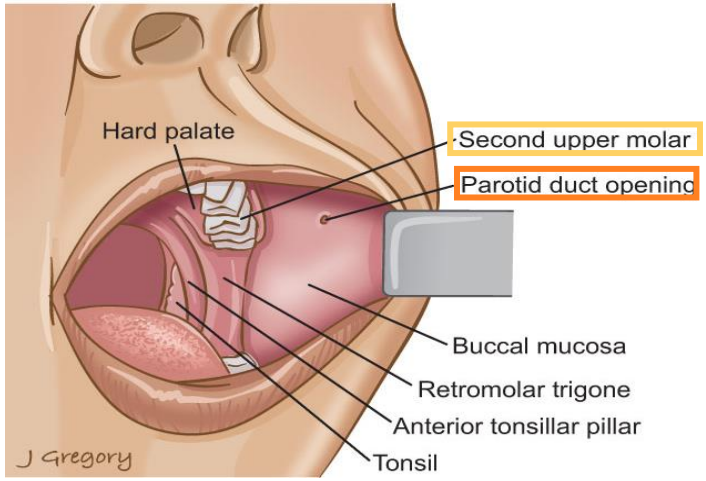


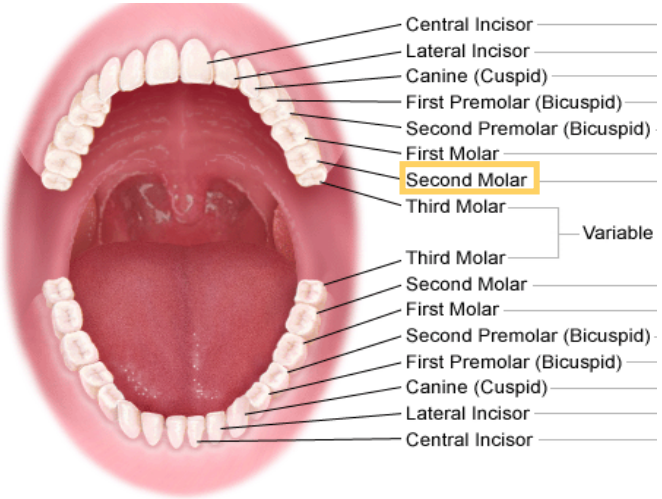


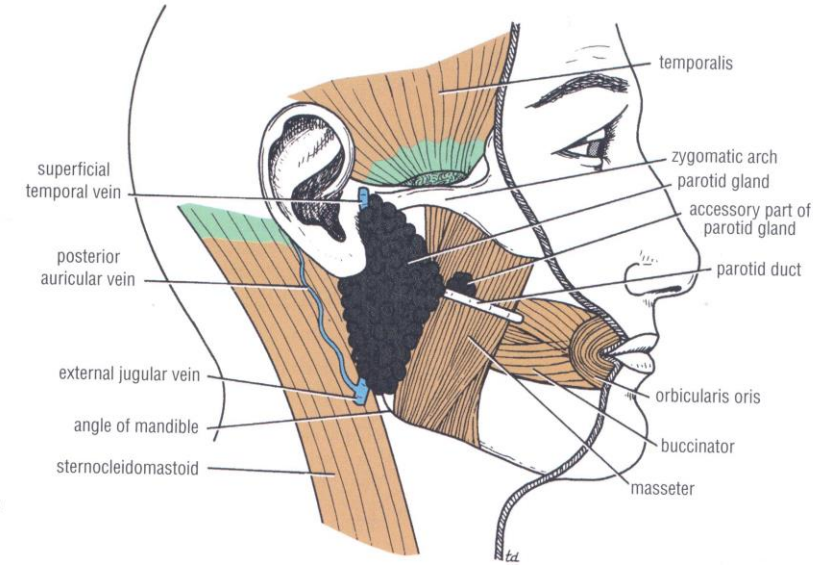


Parotid Gland
Parotid Duct (of Stensen):

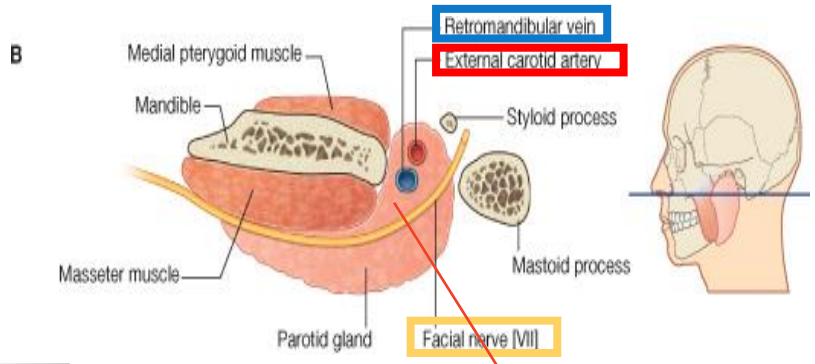
- It opens into the vestibule of the mouth on a **small papilla**, opposite the upper **second molar** (maxillary) tooth.
- Parotid duct 5 cm long, runs on the masseter muscle, then it pierces buccal pad of fat & buccinator muscle.







Structures within **Parotid Gland**



From superficial to deep OR lateral to medial (horizontal section)

(you have to know **both**)

1. Facial Nerve (motor supply) *most superficial structure*
2. Retromandibular vein *intermediate in position*
3. External Carotid artery *Most deep*

Very important Note: the sequence from outside to inside is (Nerve, vein, artery)

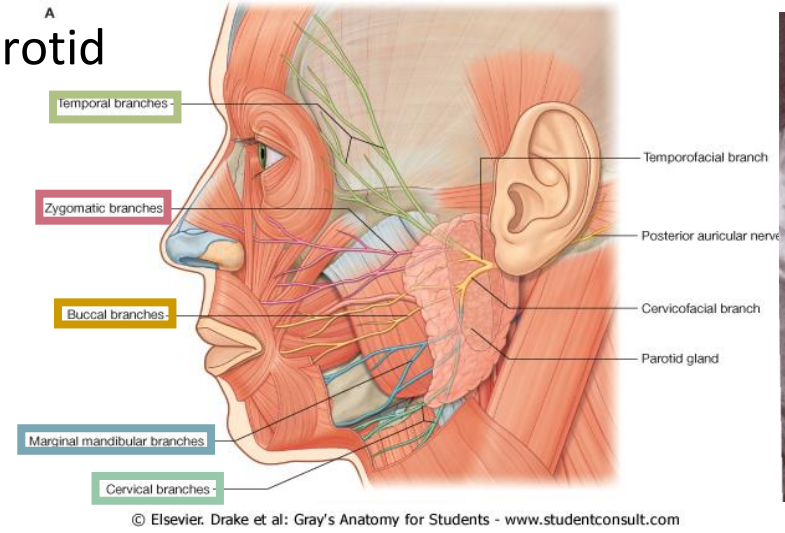
- The facial nerve it divides the gland into superficial & deep parts.
- TWO Branches **before** it enters the gland to supply two muscles (posterior belly of digastric and stylohyoid)

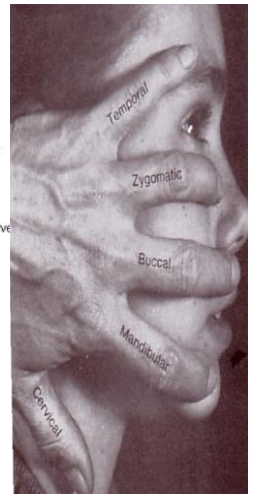
In the exam you might have a question about the structures found in the gland, so it is important to know them

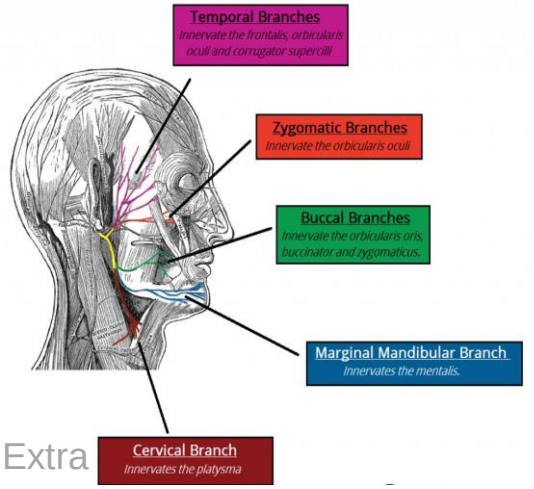
FIVE (terminal) Branches **within** the parotid which leave anteromedial suface of the gland:

1- Temporal
2- Zygomatic
3- Buccal
4- Mandibular
5- Cervical.

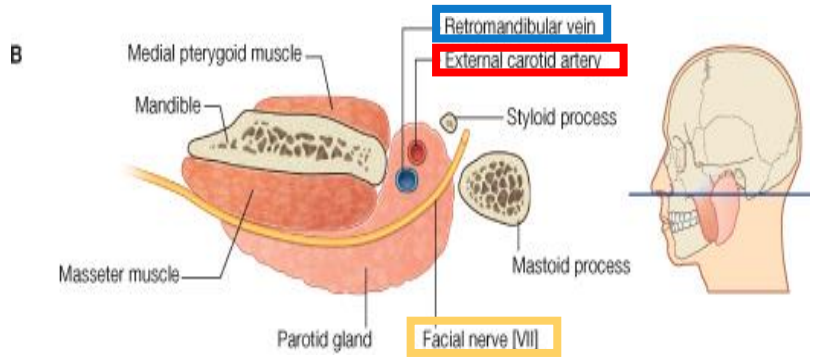
Muscles of the face







Structures within **Parotid Gland**



From superficial to deep OR lateral to medial (horizontal section)

(you have to know **both**)

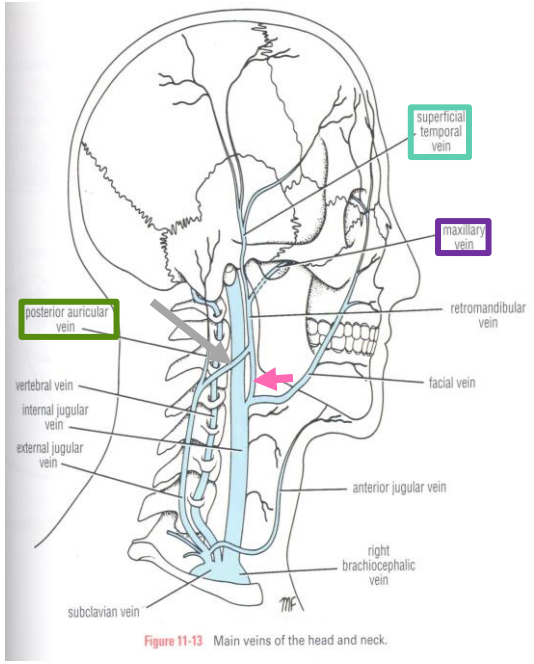
1. Facial Nerve
most superficial structure

2. Retromandibular vein
intermediate in position

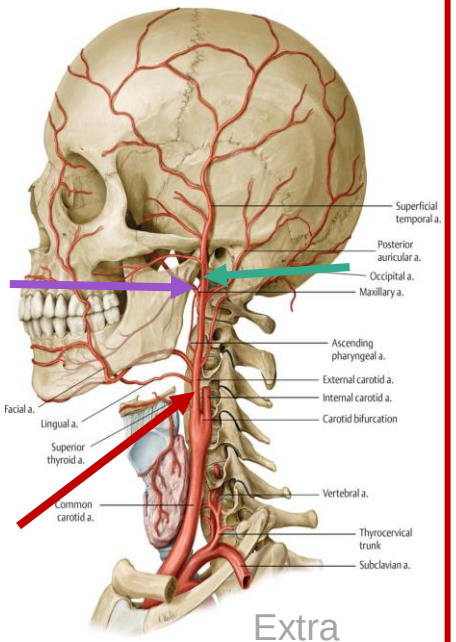
3. External Carotid artery
Most deep (most medial)

- Formed by the union of **maxillary** & **superficial temporal** veins.
- Before it leaves the gland it is divided into 2 division/branches:

1. anterior (join the facial vein and form the common facial vein)
2. Posterior (join the posterior auricular and form the external jugular)



- It is divided into its 2-terminal branches **maxillary** and **superficial temporal** arteries. (within the gland)



Extra

Inferior salivary nucleus → to parotid gland
Superior salivary nucleus → to sublingual and submandibular

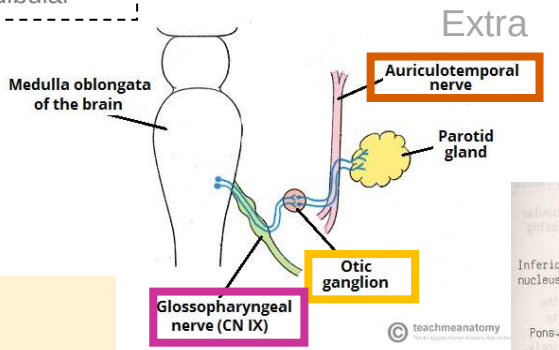
Parotid Gland
Nerve supply and lymphatic drainage

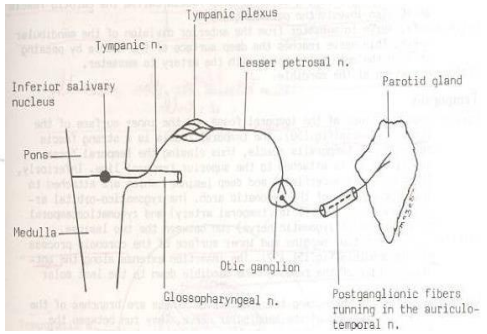
- *Parasympathetic (secretomotor):*
  - from **inferior salivary nucleus** (of 9th cranial nerve "glossopharyngeal nerve" in medulla oblongata) → via its branch: **tympanic** nerve → forms **tympanic plexus** in middle ear → then via **lesser petrosal** nerve (preganglionic fibers) to **otic ganglion**
  - The postganglionic fibers running in **auriculotemporal** nerve supply the parotid gland.

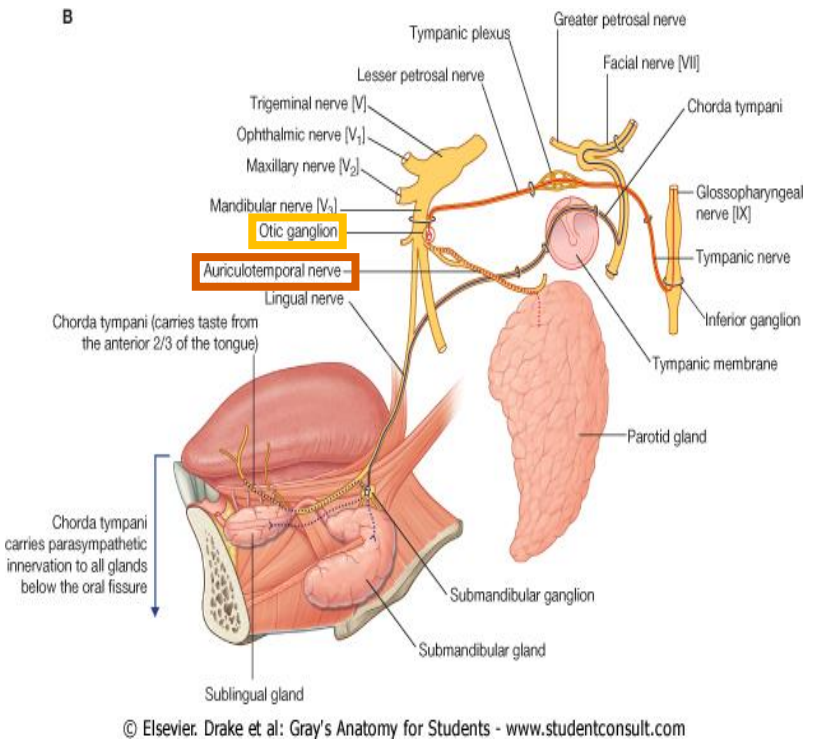
- *Sympathetic*:
  - from plexus around **external carotid artery**.

- *Lymphatic:*
  parotid lymph nodes which finally drain into upper group of **deep cervical** lymph nodes.

Extra







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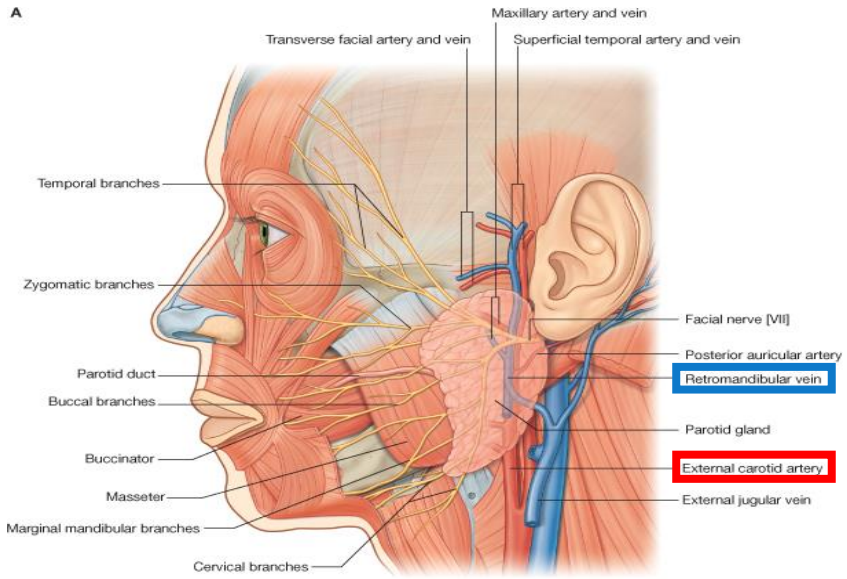
Parotid Gland
Blood supply

**Arterial supply:*

- **external carotid artery +** its branches (superior temporal and maxillary)

**Venous drainage:*

- into the **retromandibular vein**.



Clinical Notes:

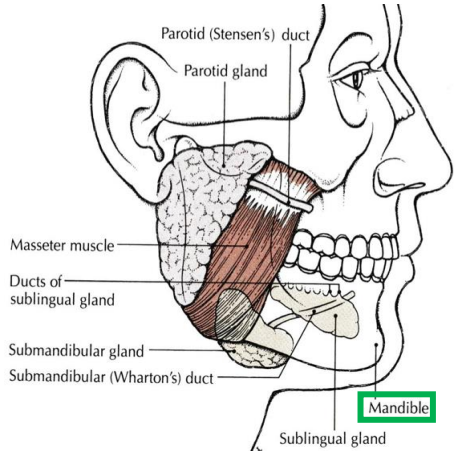
1- Parotid gland infection: Mumps

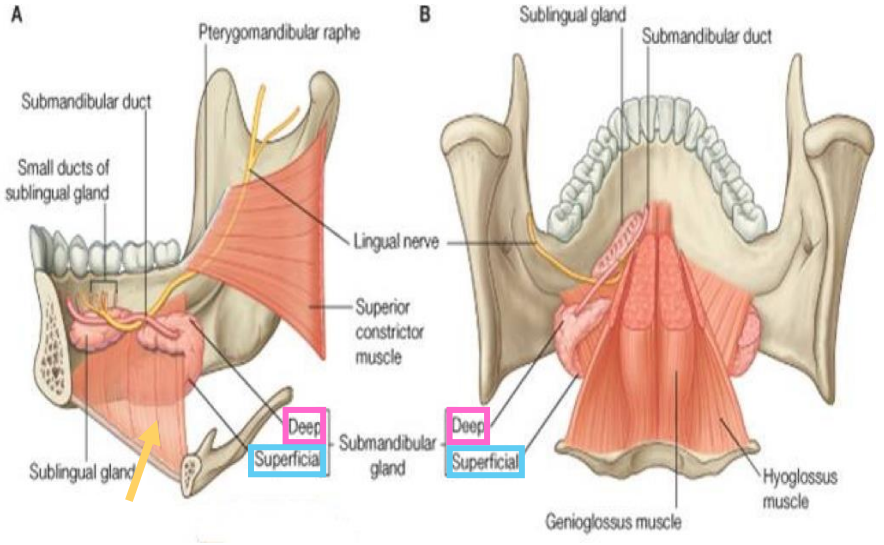
- viral disease caused by the mumps virus.
- Initial signs and symptoms often include fever, muscle pain, headache, poor appetite, and feeling tired.
- This is then usually followed by painful swelling of one or both parotid salivary glands.
- In adults
- About two to three out of every 10 adolescent or adult men who have mumps may experience painful swelling of the testicles.

Extra

Submandibular Gland

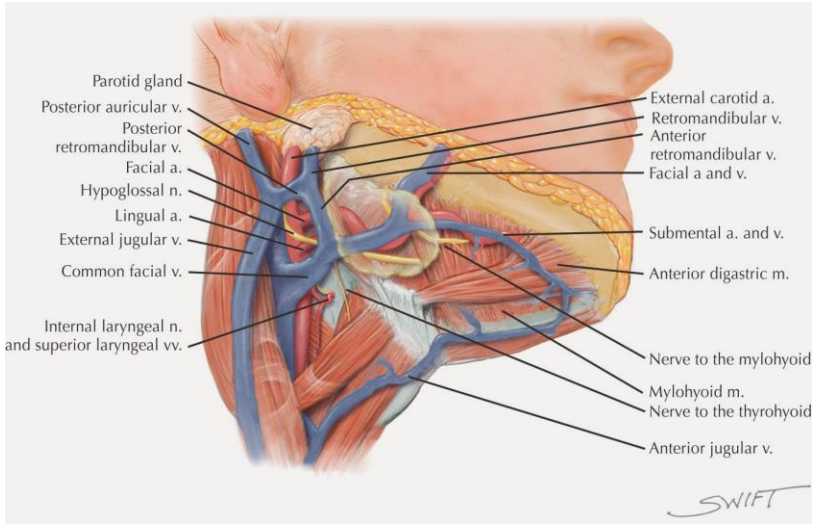
- located deep to the body of the mandible.
- Formed of two parts:
  - Large **Superficial** Part
  - Small **Deep** Part
- Both parts continuate around the mylohyoid muscle



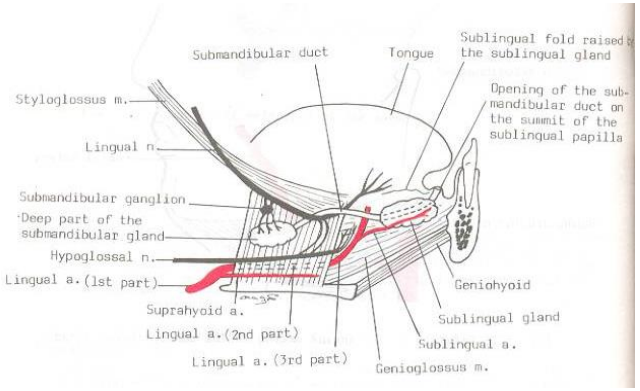


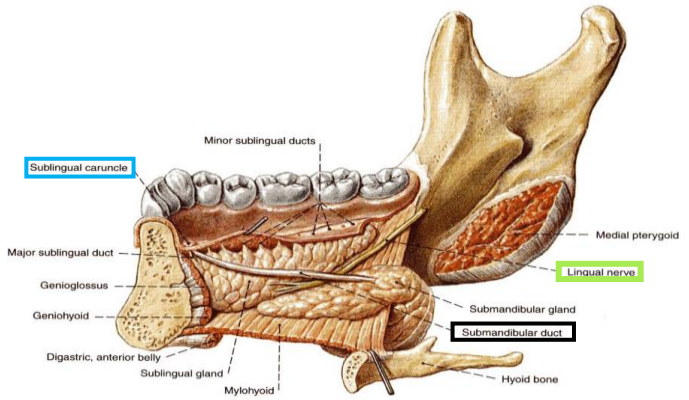
Supply

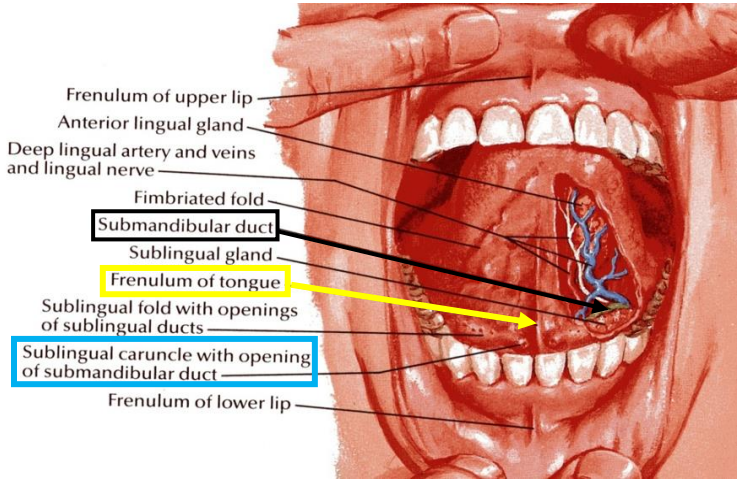
- *Arterial supply:*
  Facial artery.
- *Venous drainage:*
  Facial vein.
- *Lymph drainage:*
  Submandibular lymph nodes.



Submandibular Gland
Submandibular Duct







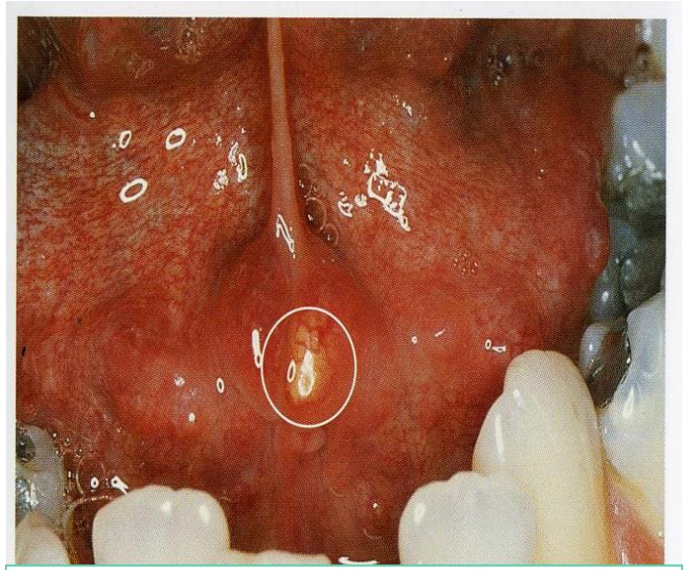
- The duct emerges from the *deep* part of the gland.
- It passes forward along the side of the tongue, *under* the mucous membrane of the floor of the mouth.
- It is crossed laterally by the **lingual** nerve.
- It opens into floor of mouth on the summit (highest point) of a small sublingual papilla (the sublingual caruncle*), which lies at the side of the **frenulum** of the tongue.
- Clinically, it is important to remember that the submandibular duct can be palpated through the floor of the mouth alongside the tongue.
- Saliva can usually be seen emerging from the orifice of the duct.

* **Sublingual caruncle:** an eminence on either side of the frenulum of the tongue, on which the major duct of the sublingual gland and the duct of the submandibular gland open.

Submandibular Duct
Clinical Note

1. Calcus Formation

- The submandibular duct is a common site of calculus formation.
- The presence of a tense swelling below the body of the mandible, which is greatest before or during a meal and is reduced in size or absent between meals, is **diagnostic** of the condition.
- Clinically: examination of the floor of the mouth will reveal absence of ejection of saliva from the orifice of the duct of the affected gland + Frequently, the stone can be palpated in the duct, which lies below the mucous membrane of the floor of the mouth.



A Small calcified stone blocking a salivary duct is visible as a yellowish mass (circled) in the center of the floor of the mouth.

Sublingual Gland

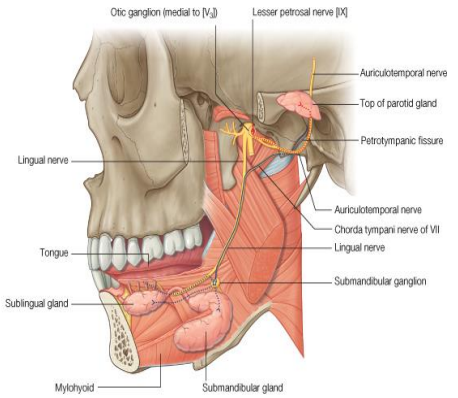
Remember:
1- A ranula is a mucous a extravasation cyst (related to sublingual gland)
2- stones are mostly (related to submandibular)
3- Mumps is a swelling (related to the parotid)

Location:

- Almond shaped
- The smallest of the three main salivary glands.
- It lies below the mucous membrane of the floor of mouth(between mylohyoid & side of the tongue), close to the midline.

Sublingual Ducts:

- The sublingual ducts are 8 to 20 in number.
- Most open into floor of mouth on the summit of the sublingual fold, but a few may open into the submandibular duct.



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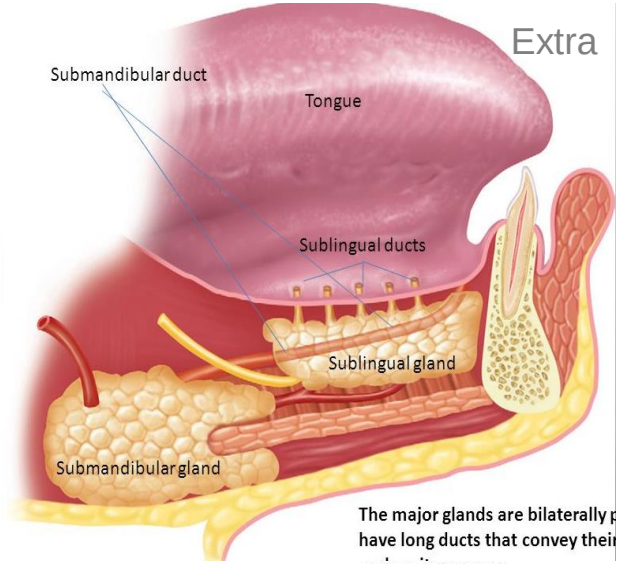
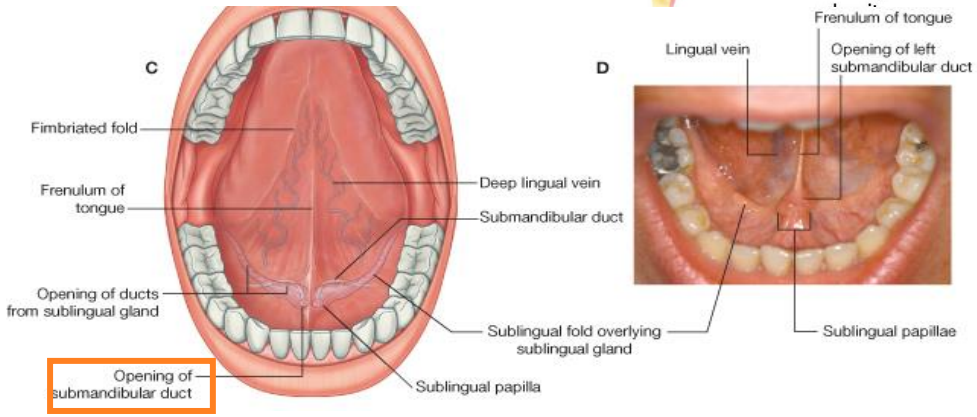


The major glands are bilaterally p
have long ducts that convey their



Clinical Note:

- RANULA
- It is a mucus extravasation cyst.
- Involved sublingual gland
- Found on the floor of the mouth.

Sublingual Gland
Supply

- *Arterial supply:*

  Facial artery.(lingual branch)

- *Venous drainage:*

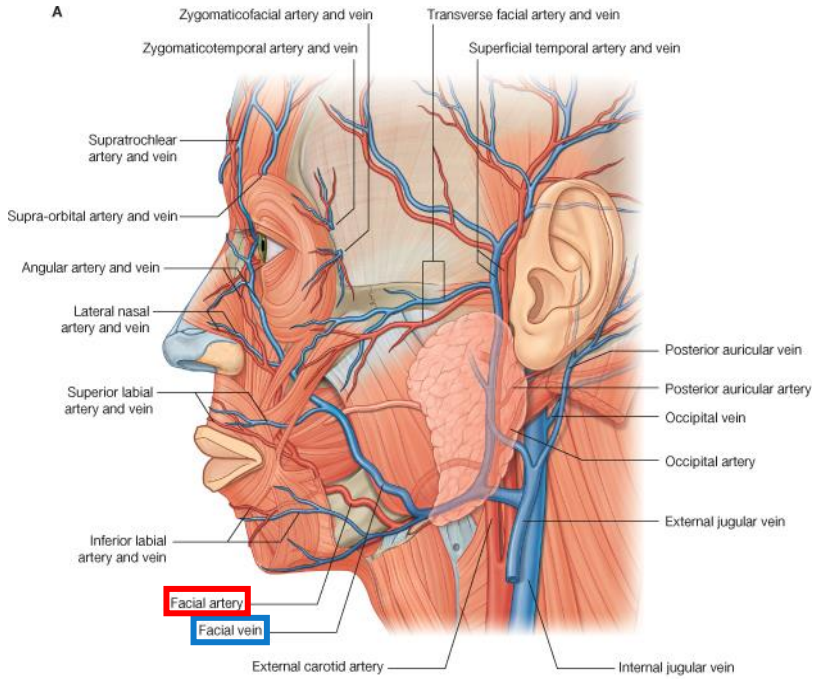
  Facial vein. (lingual branch)

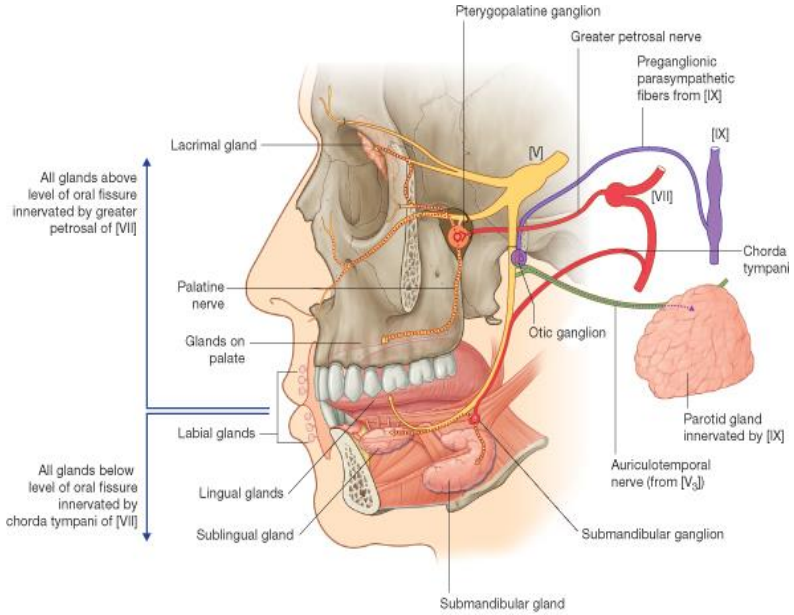
- *Lymph drainage:*

  Submandibular lymph nodes.

- *Nerve Supply*

- Parasympathetic secretomotor supply is from
- Preganglionic **superior salivary** nucleus of the facial (7th) nerve → The fibers pass to the **submandibular ganglion** via the **chorda tympani** nerve and the **lingual** nerve.
- Postganglionic parasympathetic fibers reach the submandibular & sublingual glands either directly or along the duct.
- Sympathetic: from plexus around facial artery.





GLANDS	GENERAL NOTES	DUCT	NERVE\BLOOD SUPPLY	Structures within the gland \Clinical application
PAROTID	• Largest • Formed entirely of serous acini • Triangular in shape • accessory part: A small part that is separated from the main gland. • Capsule: Tight, derived from deep cervical fascia of the neck.	It opens into the vestibule of the mouth on a small papilla, opposite the upper second molar (maxillary) tooth.	***Parasympathetic*** from inferior salivary nucleus via auriculotemporal nerve ***Sympathetic:*** from plexus around external carotid artery. **Arterial:** ECA & its branches. **Venous drainage**: retromandibular vein. **Lymphatic:** parotid & deep cervical lymph nodes.	**Structures within the gland:** 1- Facial nerve: -TWO Branches before it enters the gland -FIVE Branches within the parotid 2- Retromandibular vein. 3- External carotid artery.
SUBMANDIBULAR	• deep to the body of the mandible • Formed of 2 parts: Large superficial part, Small deep part	The duct emerges from the **deep** part of the gland. It is crossed laterally by the lingual nerve It opens on the summit of a small sublingual papilla, which lies at the side of the frenulum of the tongue.	Arterial supply: Facial + lingual artery. Lymph drainage: Submandibular + deep cervical lymph nodes Parasympathetic secretomotor supply is from superior salivary nucleus via lingual nerve	**Clinical application:** -the submandibular duct can be palpated through the floor of the mouth alongside the tongue. Saliva can usually be seen emerging from the orifice of the duct. -common site of **calculus formation**. The presence of a **tense swelling below the body of the mandible.**
SUBLINGUAL	• The smallest	• sublingual ducts are 8 to 20 in number. • Most open into the summit of the sublingual fold, but a few may open into the submandibular duct.	Arterial supply: Facial artery. Venous drainage: Facial vein. Lymph drainage: Submandibular lymph nodes Parasympathetic secretomotor supply is from superior salivary nucleus via lingual nerve	-

MCQs

1. The submandibular duct emerge from which part of the gland ?
A- The superficial part
B- The deep part
C- The anterior part
D- The posterior part

2. The submandibular duct crossed laterally by which structure ?
A- The lingual nerve
B- The facial nerve
C- The parotid duct
D- retromandibular vein

3. Which of the following duct is a common site for calculus formation ?
A- The thoracic duct
B- The parotid duct
C- The sublingual duct
D- The submandibular duct

4. What's the blood supply for the sublingual gland?
A- Sublingual artery
B- Facial Artery
C- External carotid artery
D- Submental Artery

Answers: 1. B, 2. A, 3. D, 4. B, 5. C, 6. B, 7. D, 8. B, 9. C

5. Which of the salivary is the largest?
A.Sublingual
B.submandibular
C.Parotid
D.Buccal

6. Parotid produces a
A. mixed serous & mucous secretion.
B. serous secretion
C. mucous secretion
D. nothing

7. Structures within the Parotid gland?
A. Facial nerve
B. Retromandibular vein
C. External carotid artery
D. All of the above

8.How many branches the facial nerve gives before it enters the parotid?
A.5 B.2 C.3 D.4

9.Which of the salivary glands is capsulated by the deep cervical faciae?
A.Sublingual
B.submandibular
C.Parotid
D.Buccal

SAQ

A\ What are the structures within the parotid gland ?

1-Facial nerve – most superficial structure

2- retromandibular vine - intermediate in position

3- External carotid artery – most deep structure

B\ Qhat's the nerve supply for the parotid gland ?

- Sympathetic from plexus around External carotid artery
- Parasympathetic from (inferior salivary nucleus- tympanic nerve) through the glossopharyngeal nerve to tympanic plexus –lesser petrosal to otic ganglion which is postganglionic fiber running in auriculotemporal nerve

Good luck
Special thank for team436 ❤

Team Leaders:

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Rawan Mishal

- References:
  1. Girls' & Boys' Slides
  2. Greys Anatomy for Students
  3. TeachMeAnatomy.com

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