Salivary Gland Neoplasms: Navigating Difficult Surgical Landscapes

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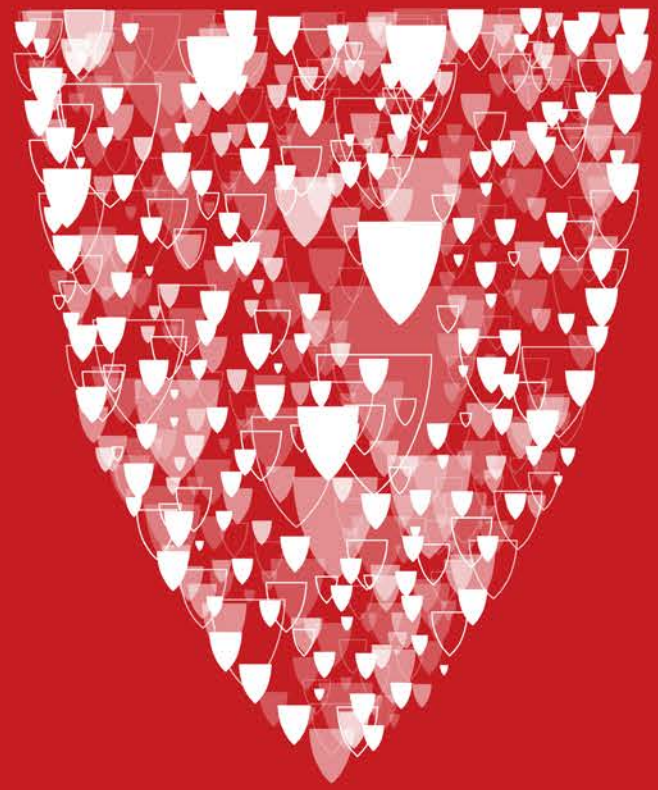


22nd Annual Aultman Cancer Symposium
Saturday, September 27, 2025

University Hospitals
Cleveland | Ohio

Learning Objectives

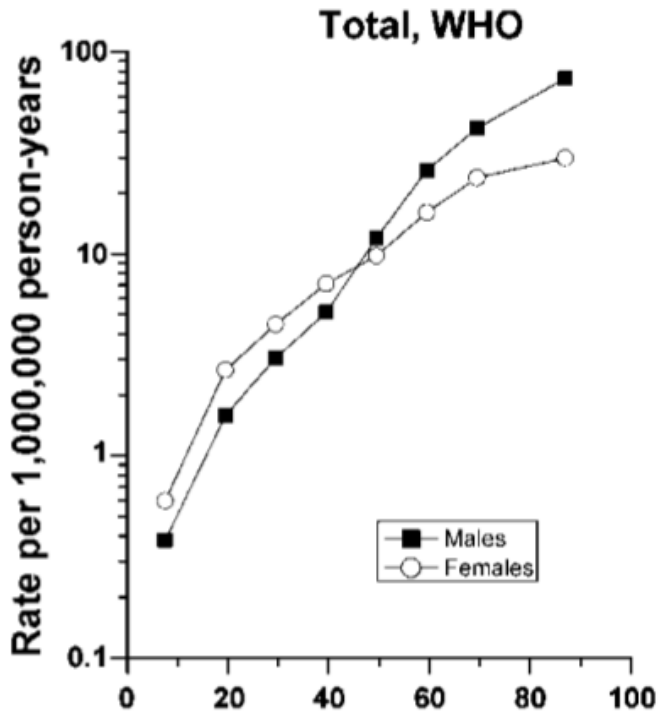
- Describe key features of the most common neoplasms arising in the major and minor salivary glands including clinical history and histology.
- Review the role of surgery in curative approaches to salivary gland malignancy.
- Discuss approaches to facial nerve preservation in difficult cases.

Outline

1. Epidemiology
2. Clinical features
3. Anatomic overview
4. Treatment paradigms
5. Surgical approaches
6. Case presentations

Epidemiology

- Salivary gland malignancy is overall quite rare
  - 6-8% of head and neck cancers
  - Incidence of 1.1 cases per 100,000 individuals in United States
- Greater predominance in women <50 years; >50 years more common in men
- Salivary gland neoplasms in children much more likely malignant (50%)
  - Incidence 0.8-1.4 per 1,000,000 children



Boukheris et al, 2009

Epidemiology

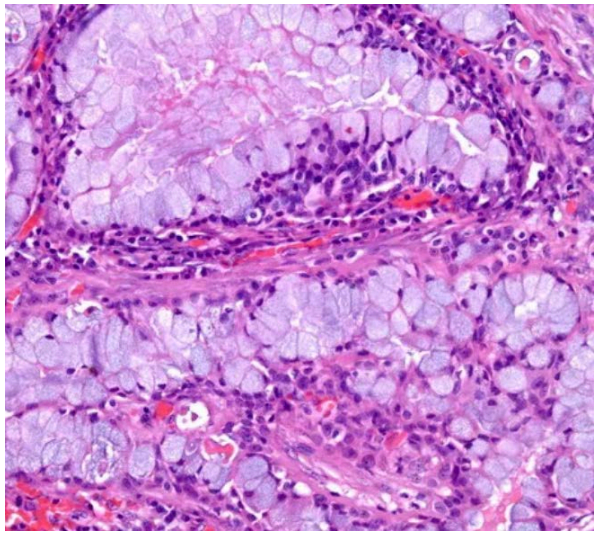
- Majority of salivary gland neoplasms are benign (80%)
  - Pleomorphic adenoma by far most common
  - Warthin's tumors (smoking predilection)
- Parotid is most common tumor subsite
- **The smaller the gland, the more likely the tumor is malignant**

		Parotid gland		Submandibular gland		Minor salivary glands	
Pleomorphic adenoma	BENIGN	70%	80%	50%	60%	15%	20%
Warthin's tumor		5%					
Adenoid cystic carcinoma	MALIGNANT	5%	20%	20%	40%	75%	80%
Mucoepidermoid carcinoma		10%		15%			

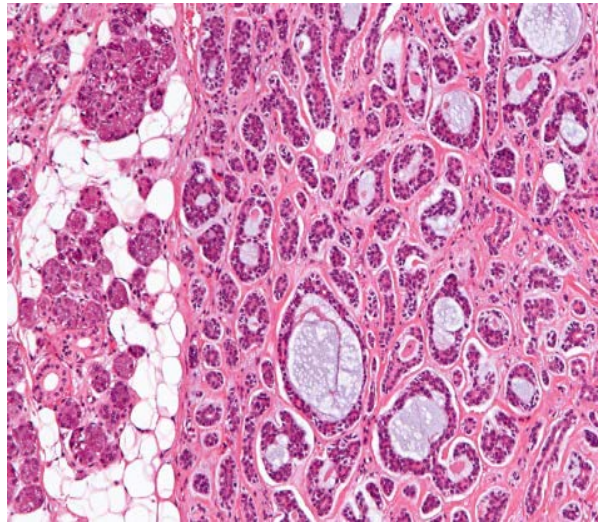
Gaillard et al, 2015

Histologic subtypes

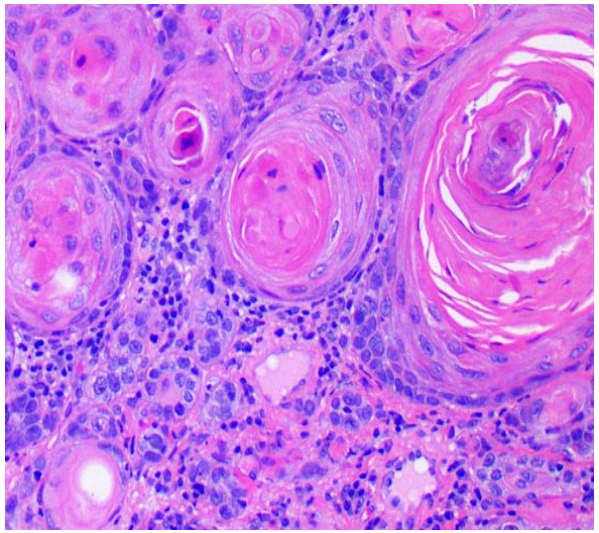
Mucoepidermoid carcinoma



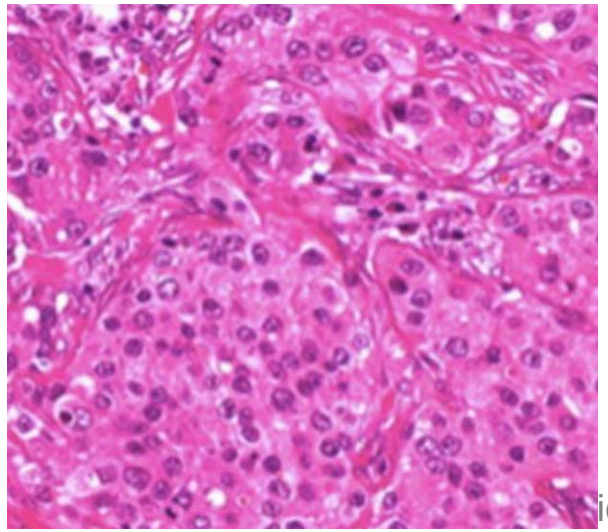
Adenoid cystic carcinoma



Squamous cell carcinoma



Acinic cell carcinoma



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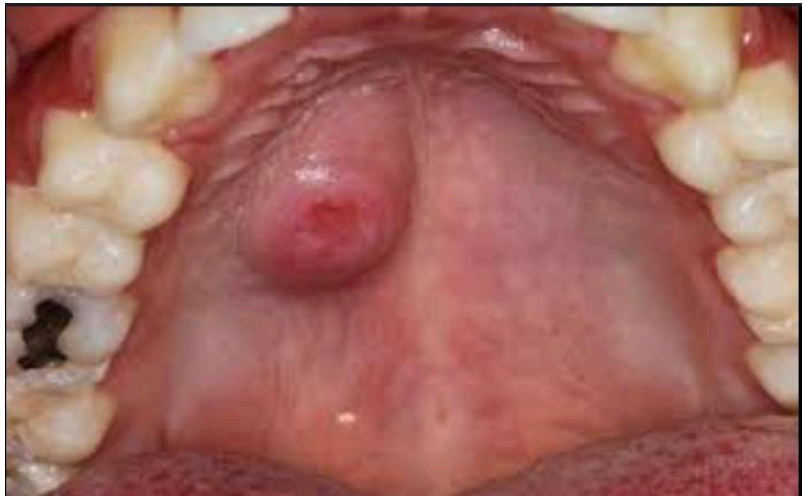
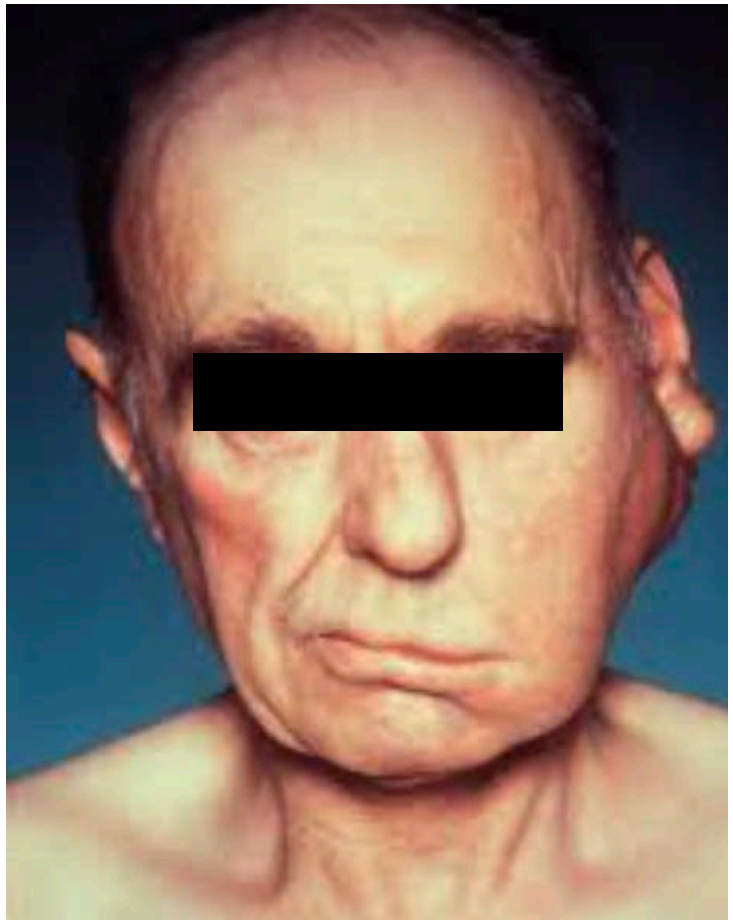
Clinical presentation

- Most commonly present with neck mass
- Red flag features for malignancy:
  - Rapid growth
  - Local or referred pain
  - Facial paresis
  - Fixation of overlying skin
  - Trismus
- 14-20% with clinical nodal metastases

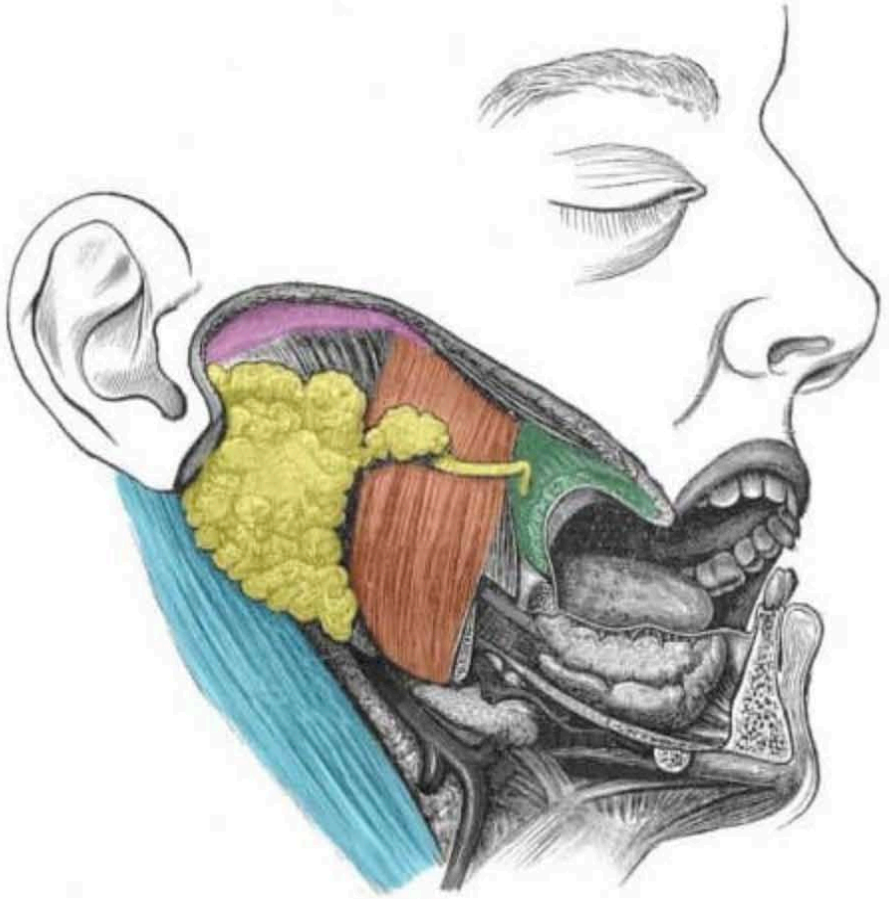


Clinical presentation

- **Facial nerve paralysis in the presence of a parotid mass = malignancy** until proven otherwise
  - Indicative of perineural invasion
  - Less commonly mass effect
  - Low likelihood of recovering native nerve function with treatment



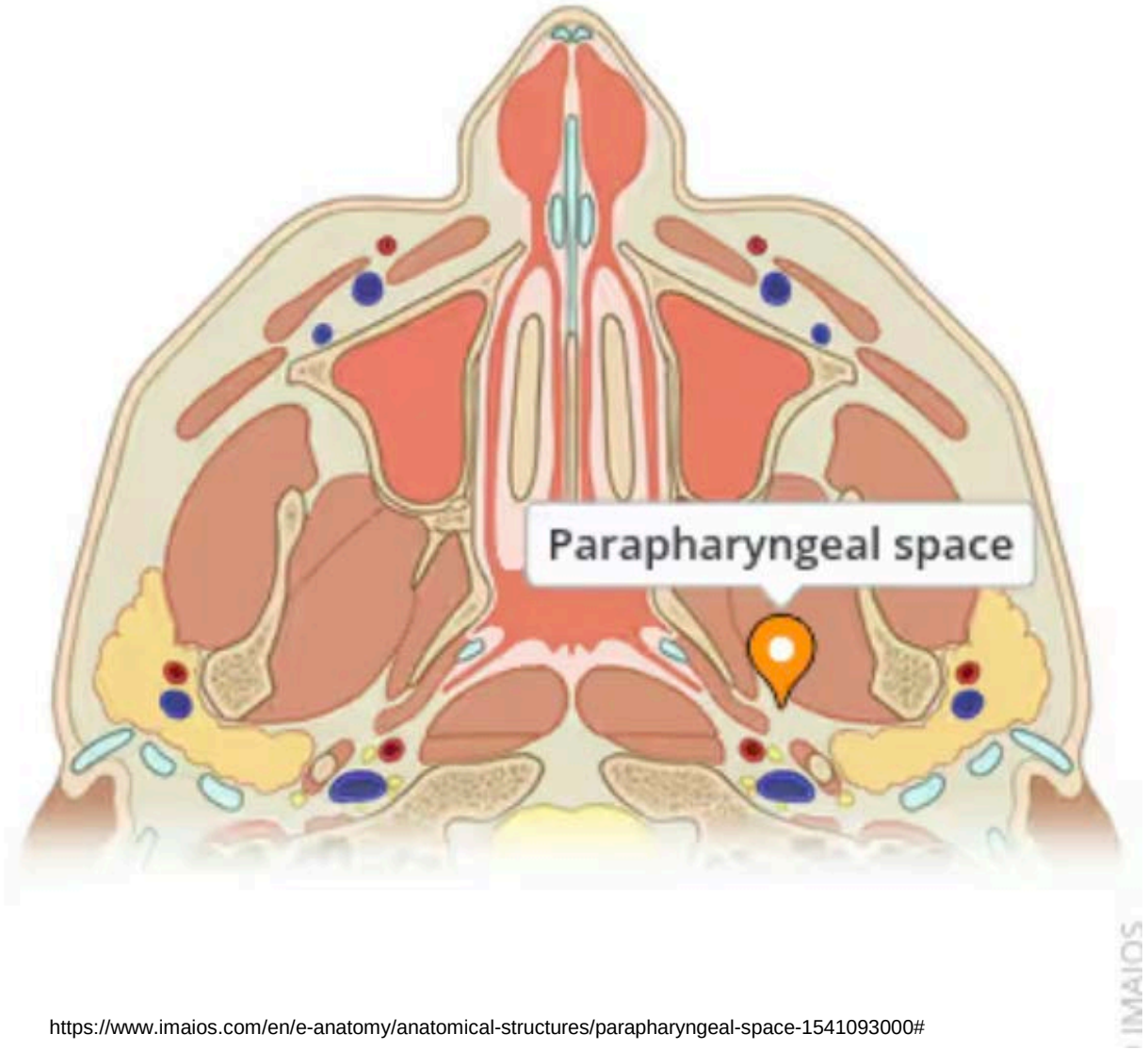
Anatomy – Parotid gland



- **Parotid gland and duct**
- **Zygomatic arch** (superior border)
- **Sternocleidomastoid** (posterior border)
- **Masseter** (anterior border)
- **Buccinator**

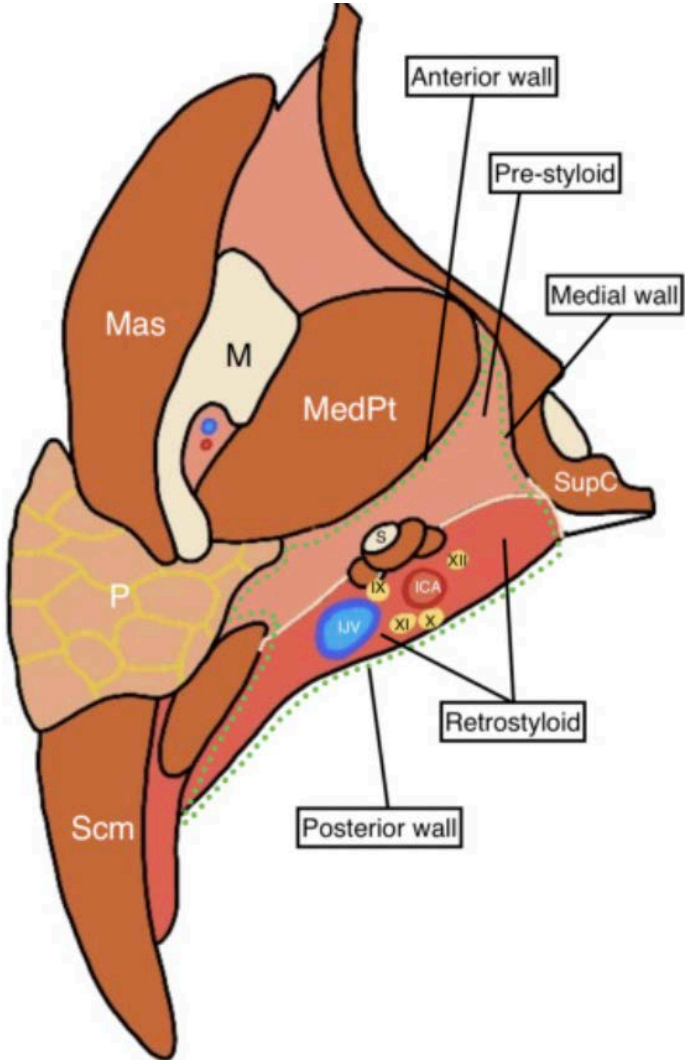
https://teachmeanatomy.info/head/organs/salivary-glands/parotid/

Anatomy – Parotid gland



https://www.imaios.com/en/e-anatomy/anatomical-structures/parapharyngeal-space-1541093000#

Anatomy – Parotid gland

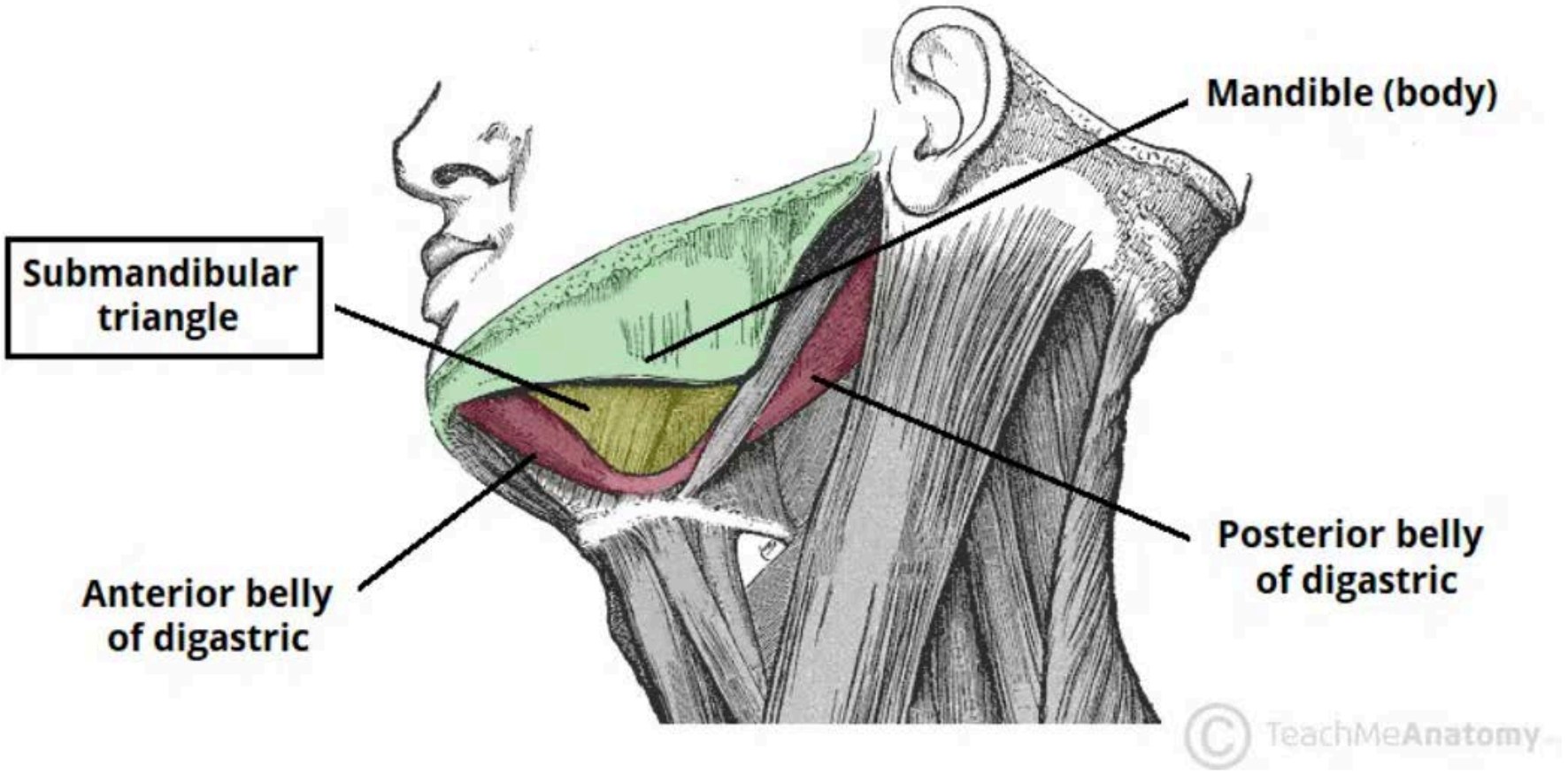


Rai et al, 2024

Pre-styloid parapharyngeal space mass

Vargas et al, 2022

Anatomy – Submandibular gland



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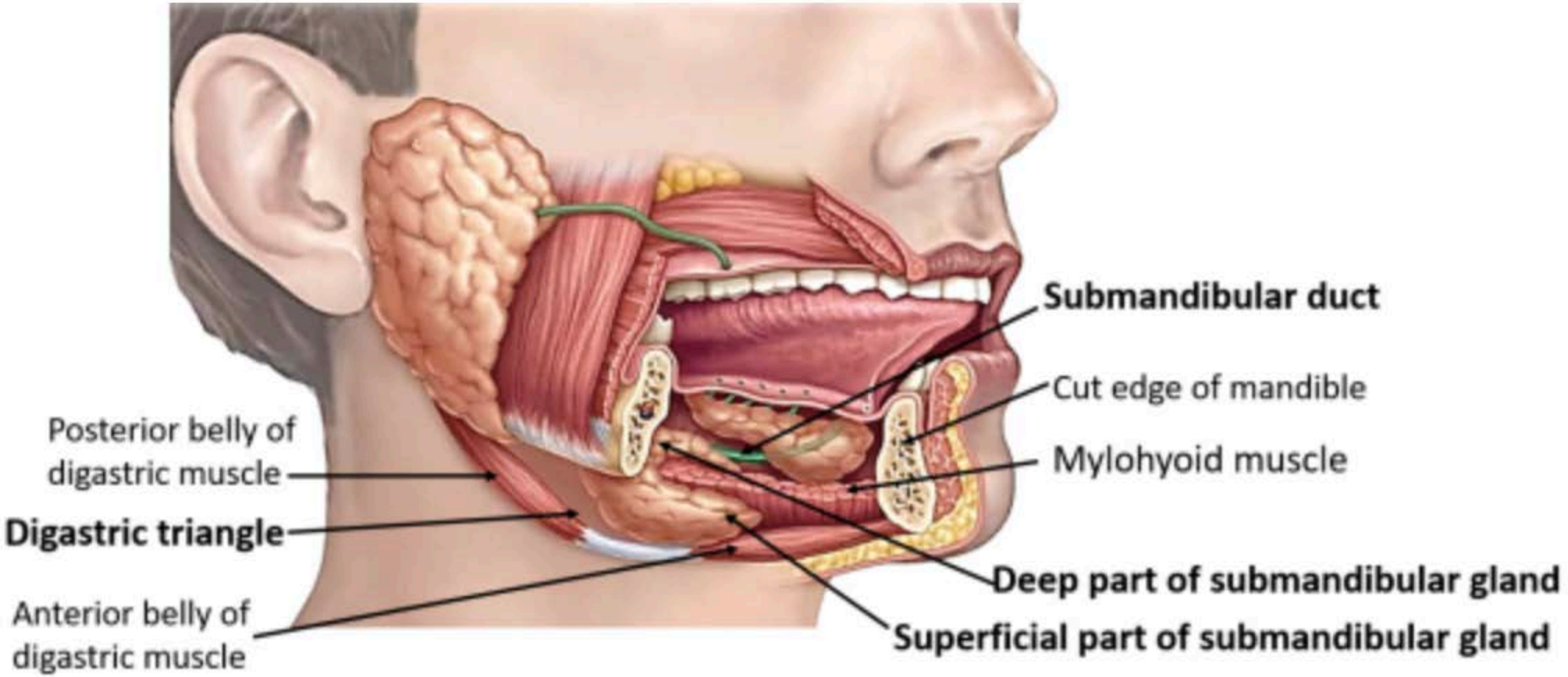
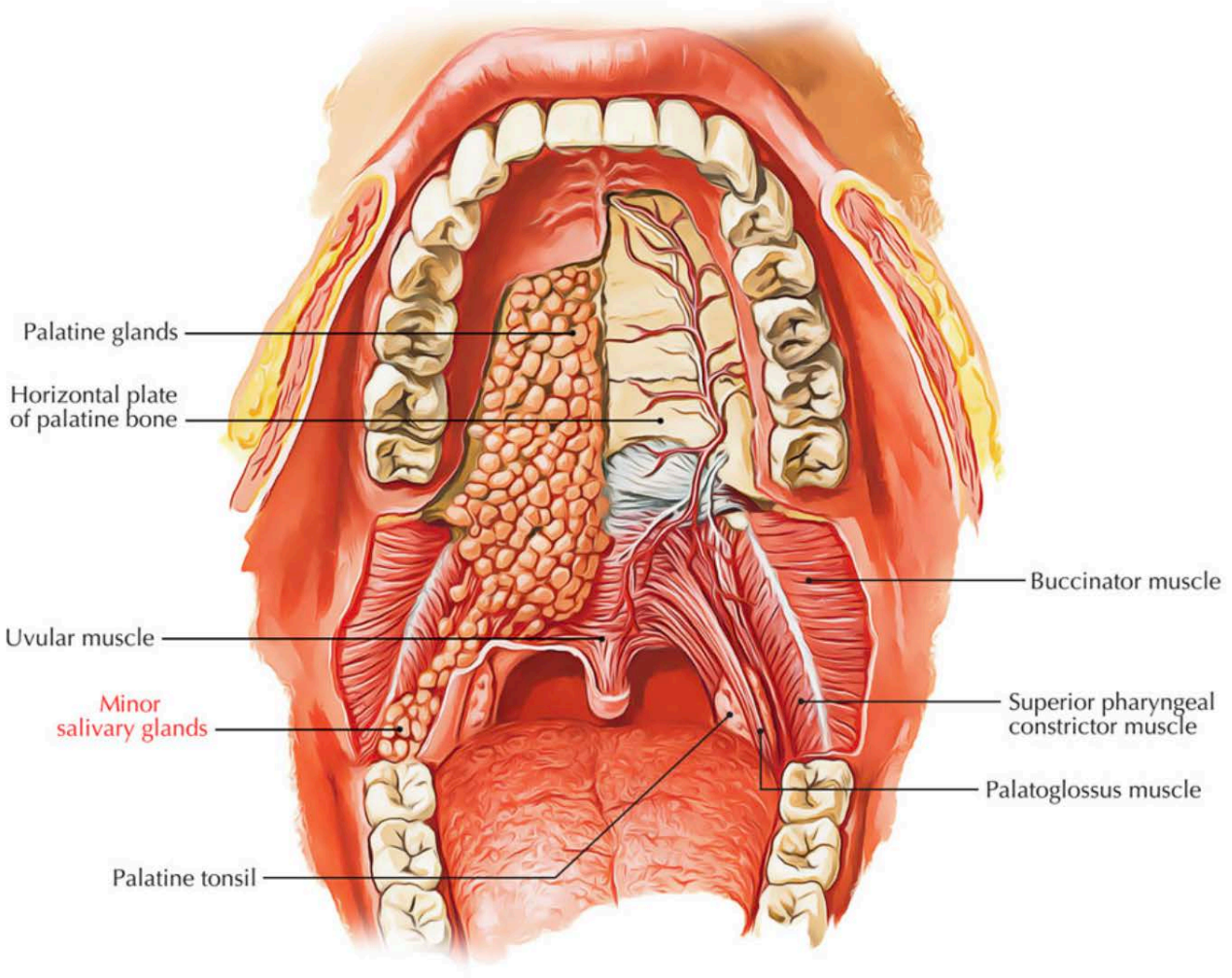
Anatomy – Submandibular gland



https://anatomyqa.com/submandibular-gland/

Anatomy – Minor salivary glands



https://www.earthslab.com/anatomy/salivary-glands/#content-location-of-minor-salivary-glands

Tumor staging – AJCC 8th ed.

Major salivary gland

Primary Tumor (T)

TX		Primary tumor cannot be assessed
T0		No evidence of primary tumor
Tis		Carcinoma *in situ*
T1		Tumor 2 cm or smaller in greatest dimension without extraparenchymal extension*
T2		Tumor larger than 2 cm but not larger than 4 cm in greatest dimension without extraparenchymal extension*
T3		Tumor larger than 4 cm and/or tumor having extraparenchymal extension*
T4		Moderately advanced or very advanced disease
	T4a	Moderately advanced disease Tumor invades skin, mandible, ear canal, and/or facial nerve
	T4b	Very advanced disease Tumor invades skull base and/or pterygoid plates and/or encases carotid artery

Note: Extraparenchymal extension is clinical or macroscopic evidence of invasion of soft tissues. Microscopic evidence alone does not constitute extraparenchymal extension for classification purposes.

Minor salivary gland

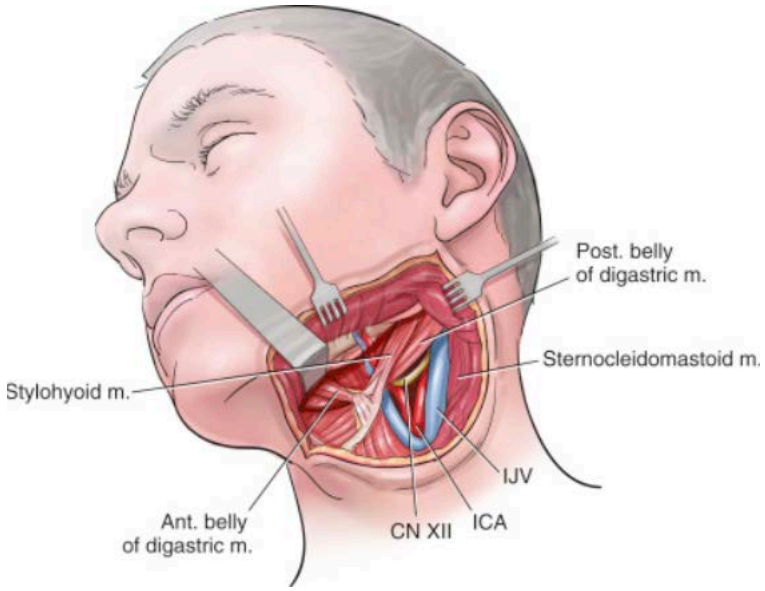
Site specific – ie. oral cavity (DOI), oropharynx

Treatment

- Resectable disease:
  - Primary surgical resection followed by pathology-guided adjuvant therapies is the standard of care for salivary gland malignancies
  - Goal: free surgical margins
  - Proximity to facial nerve limits extent of margins
  - Excellent disease control for T1-T2N0 low- and intermediate-grade mucoepidermoid and acinic cell carcinoma with surgery alone (Zenga et al, 2018; Zenga et al, 2019)

Treatment

- Indications for neck dissection:
  - Clinical positive nodal disease
  - Advanced-stage tumors (T3 and T4)
  - High-grade malignancies (>20% occult nodal disease):
    - High-grade mucoepidermoid carcinoma
    - Salivary ductal carcinoma
    - Carcinoma ex-pleomorphic adenoma



https://www.advancedentcentre.com/centre-for-excellence/head-neck-surgery/neck-dissection/

Treatment

- Postsurgical adjuvant therapies
  - Radiation
    - All patients with adenoid cystic carcinoma (including early-stage)
      - Improves locoregional control but not distant metastatic risk
    - High-grade histology
    - Positive margins
    - Perineural invasion
    - Lymphovascular invasion
    - T3-4 tumors
    - N+ disease

Treatment

- Postsurgical adjuvant therapies
    - Chemotherapy
        - Not typically recommended outside of clinical trial
        - No RCTs comparing adjuvant RT vs CRT for salivary gland malignancy

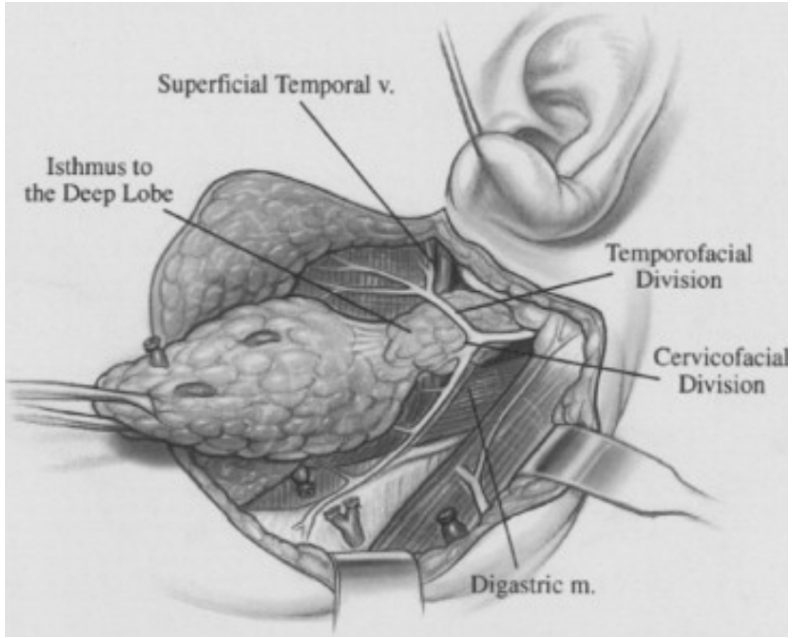
Treatment

- Unresectable disease/comorbidities precluding surgery
  - Consider definitive radiation (70 Gy)
  - Unclear additional benefit of chemotherapy
- Metastatic disease
  - Molecular testing to assess for targeted therapy candidacy
  - Androgen receptor (AR) and HER2-neu testing
  - Clinical trials

Surgical approaches

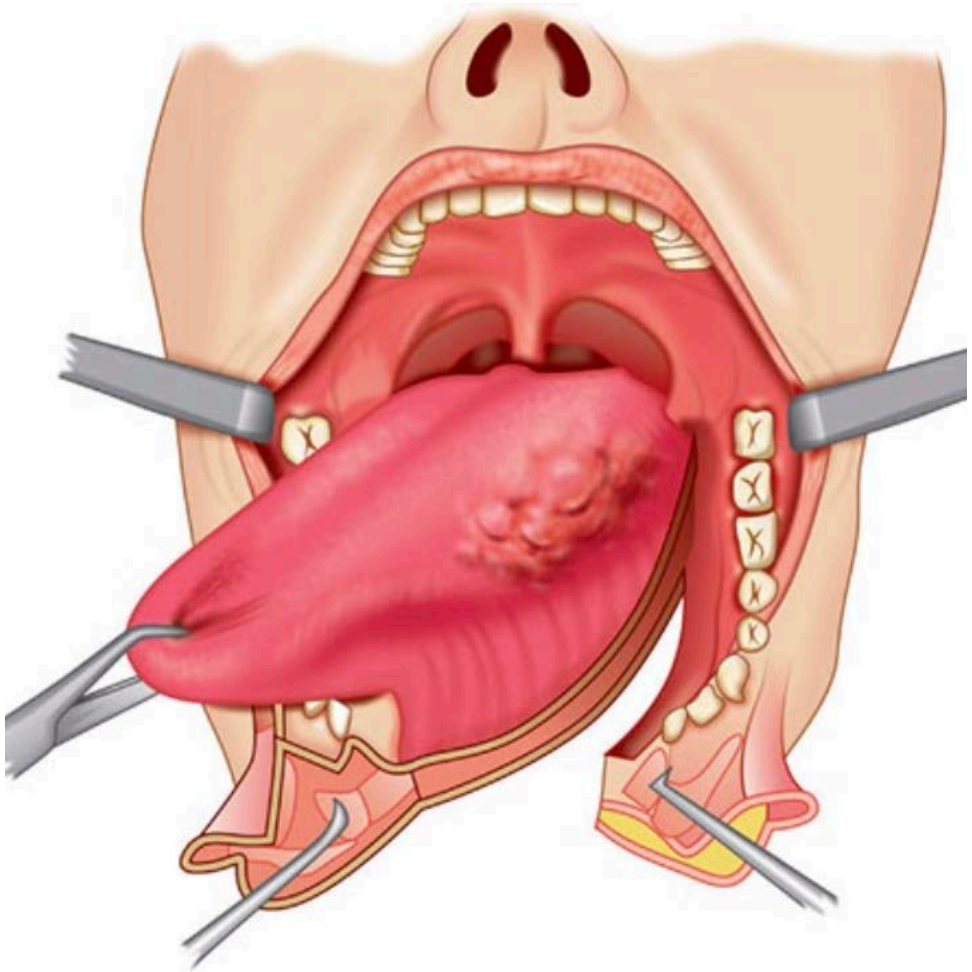
- Major salivary gland
  - Parotidectomy
  - Transcervical

Modified Blair incision



Surgical approaches

- Major salivary gland
  - Parotidectomy
  - Transcervical
  - Mandibulotomy combined approach
  - Endoscopic



https://arrangoizmd.com/2020/04/07/paramedian-madibulotomy/

Surgical approaches

- Minor salivary gland
  - Transoral
  - Transcervical
  - Robotic

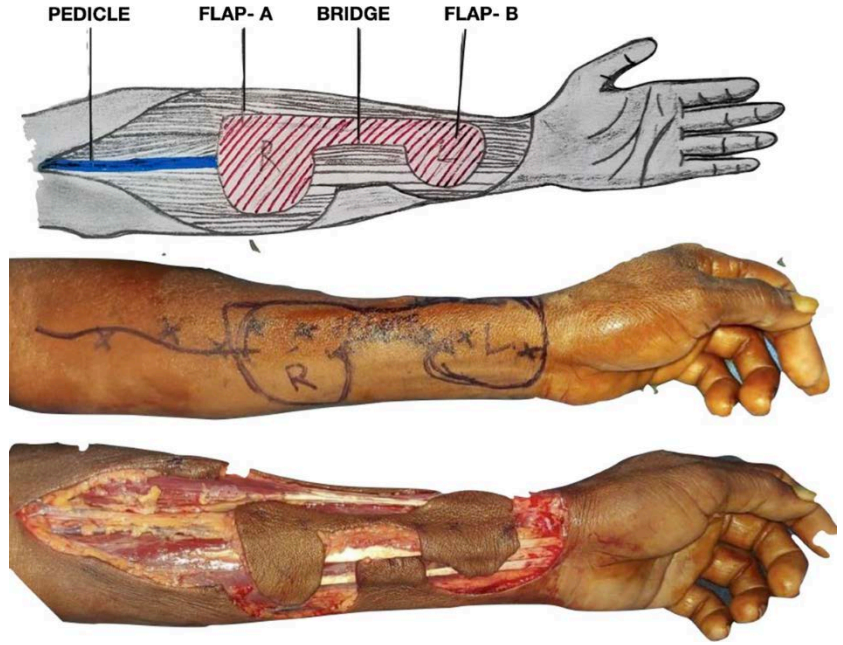
https://surgeryreference.aofoundation.org/cmf/reconstruction/midface/midface-brown-i-palate/obturator

https://www.entcentral.co.nz/robotic-head-and-neck/

Surgical approaches

- Indications for regional pedicled flaps or free tissue transfer
  - Significant soft tissue or bony defect following surgery
  - Functional and/or cosmetic restoration

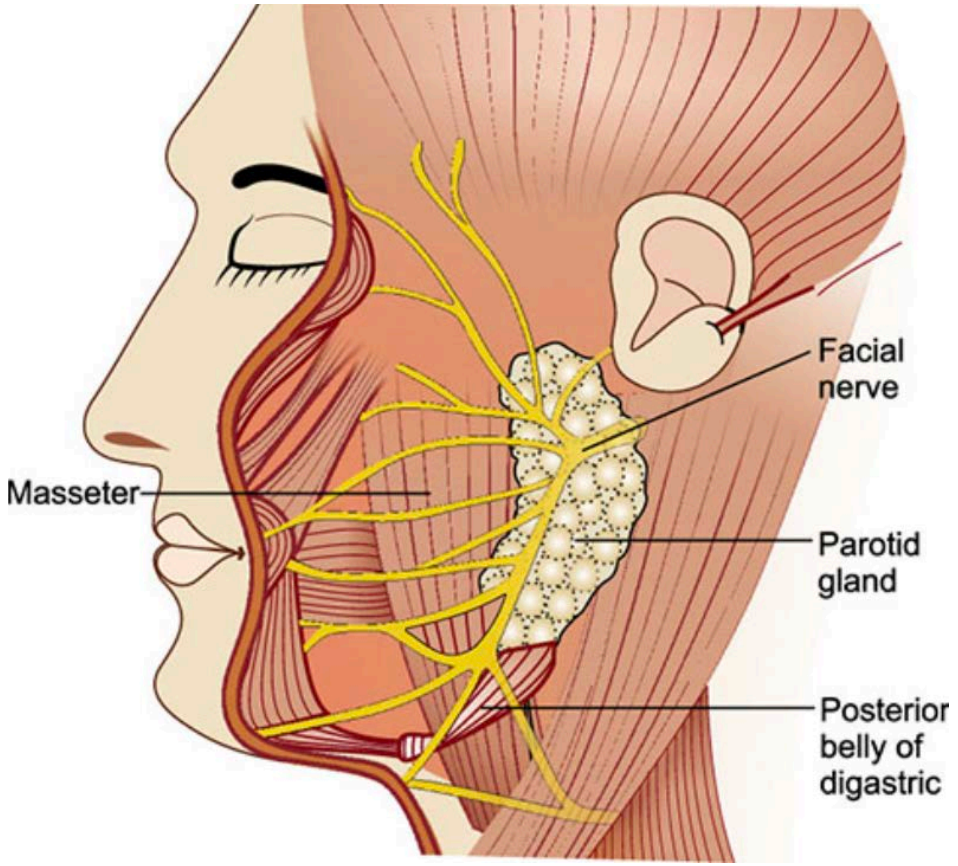
Ferrari et al, 2019



Juturu et al, 2023

Management of the facial nerve

- Often center of intraoperative decision making
- If facial nerve is functional preoperatively:
  - Attempt preservation if tumor can be dissected off
  - Nerve resection if tumor is visibly encasing or grossly infiltrating branches



https://www.jaypeedigital.com/book/9788180618475/chapter/ch4

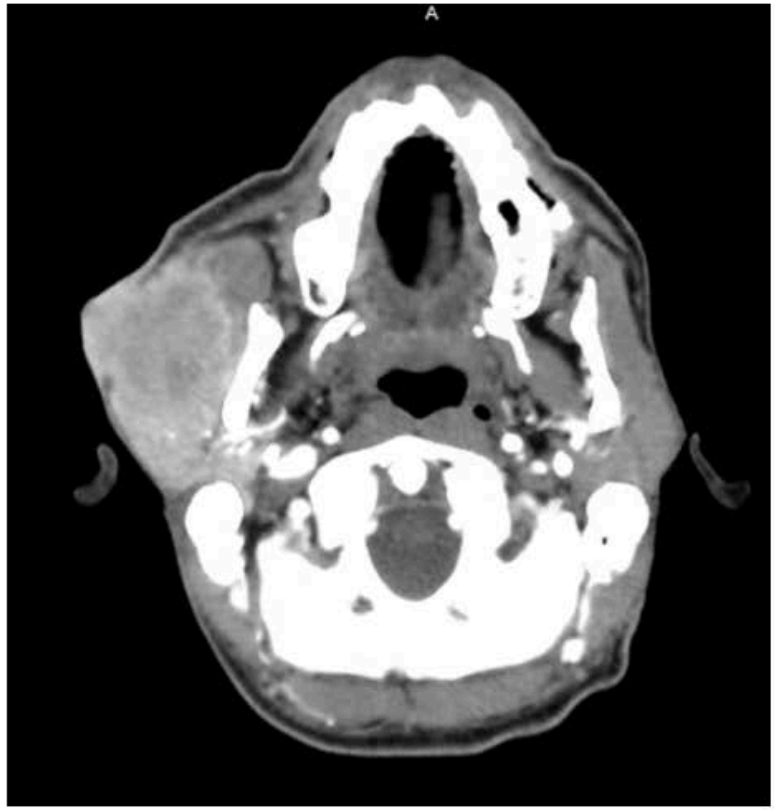
Management of the facial nerve

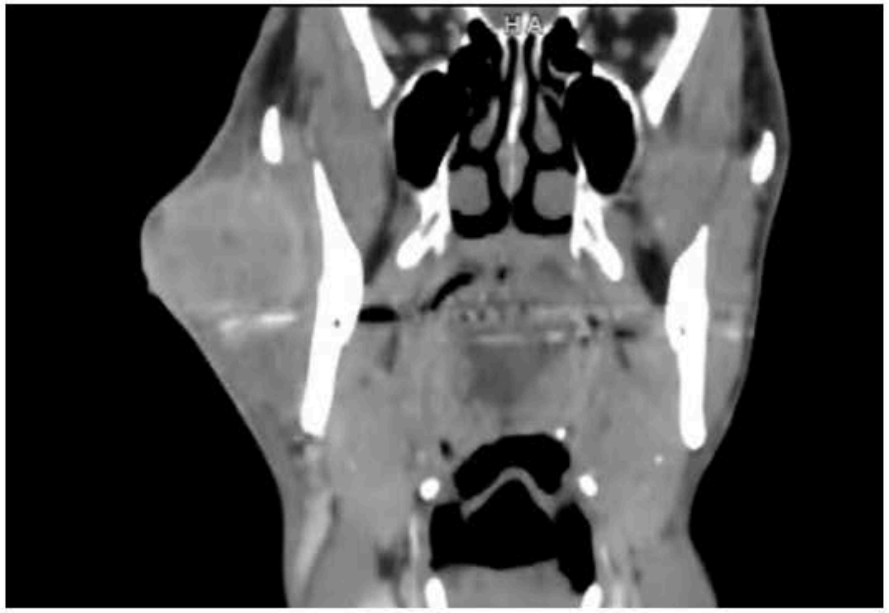
- If there is facial paralysis preoperatively:
  - Typically requires nerve resection (major branches vs main trunk)
  - Can consider preserving functional branches of nerve
  - Consideration of combined facial reanimation procedure(s)
- In general, resection of facial nerve branches indicated only to facilitate complete margin clearance or when nerve is grossly infiltrated/encased by tumor

Case presentation 1

- **68 yo M with right parotid mass initially treated for acute parotitis, refractory to antibiotics**
  - Continued progression of mass and increasing pain
  - Erupted through skin
  - Biopsy: **high-grade mucoepidermoid carcinoma**
  - Exam:
    - Firm, immobile parotid mass with erosion through skin
    - Incomplete right facial paralysis with mild lagophthalmos, blunted nasolabial fold

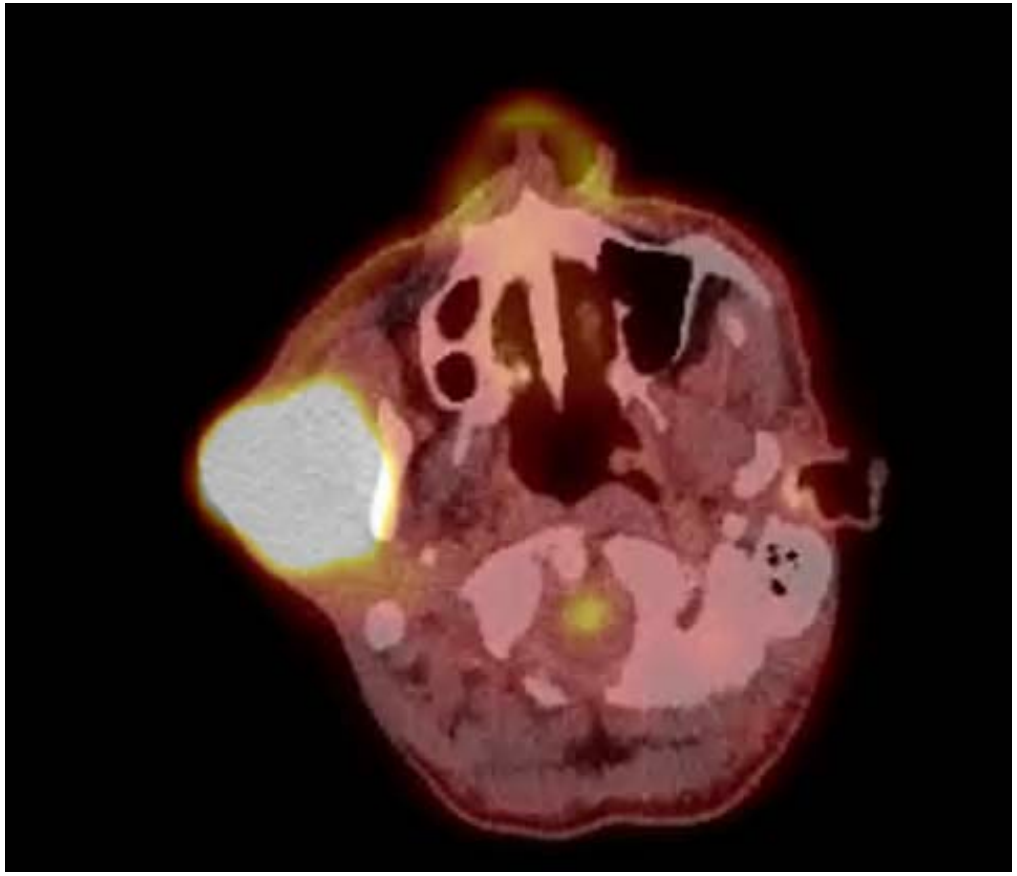
Case presentation 1





Case presentation 1

cT4aN0M0



Case presentation 1

- Surgical resection and reconstruction:
  - Radical parotidectomy with resection on 7 cm x 6 cm overlying skin, right levels 2-4 selective neck dissection, right anterolateral thigh free flap reconstruction, static sling, facial nerve cable grafting
    - Resection through masseter muscle
    - Sacrifice of encased upper facial nerve branches with preservation of marginal mandibular nerve
    - Frozen section from proximal end of upper division negative for carcinoma
    - Circumferential skin frozen margins negative for carcinoma
    - Right tensor facia lata sling to oral commissure for static facial reanimation
    - Use of nerve to vastus lateralis for cable grafting of right buccal branch

Case presentation 1

- Surgical pathology:
  - 5.2 cm high-grade mucoepidermoid carcinoma with extension through masseter and overlying skin, +PNI/LVI
  - All skin margins negative for carcinoma
  - 1/28 involved lymph nodes without ENE
  - Final staging: **pT4aN1M0**
- Tumor board recommendation:
  - Referred for **adjuvant radiation**

Case presentation 1

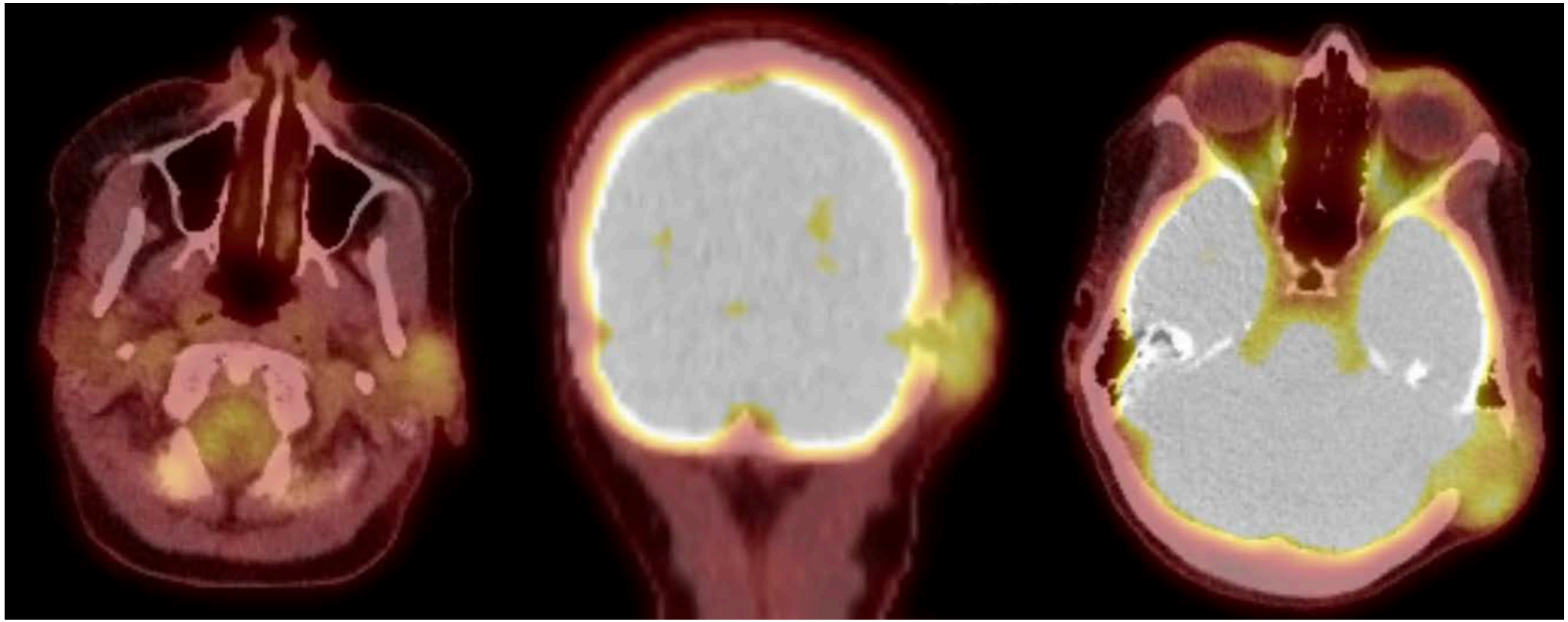
POD 5

POD 10

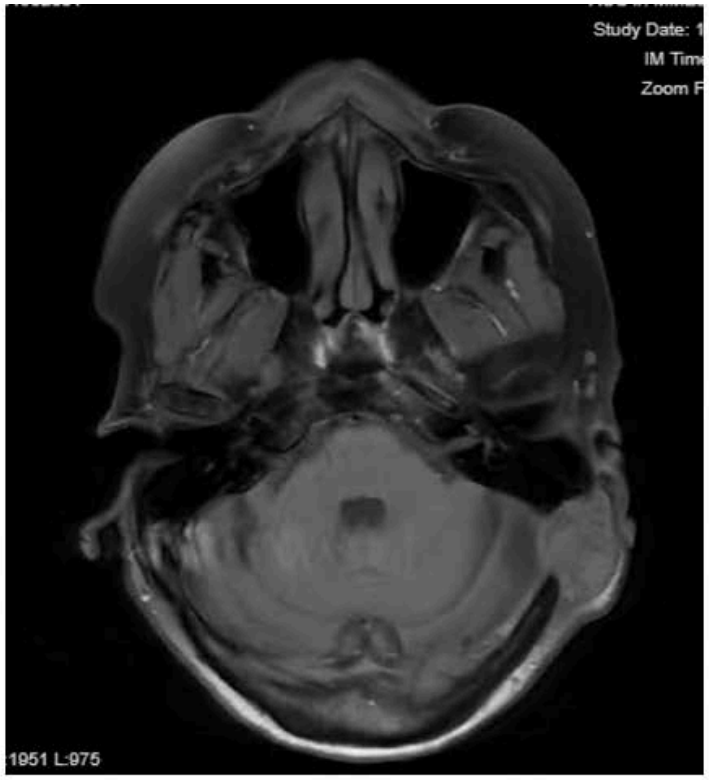
Case presentation 2

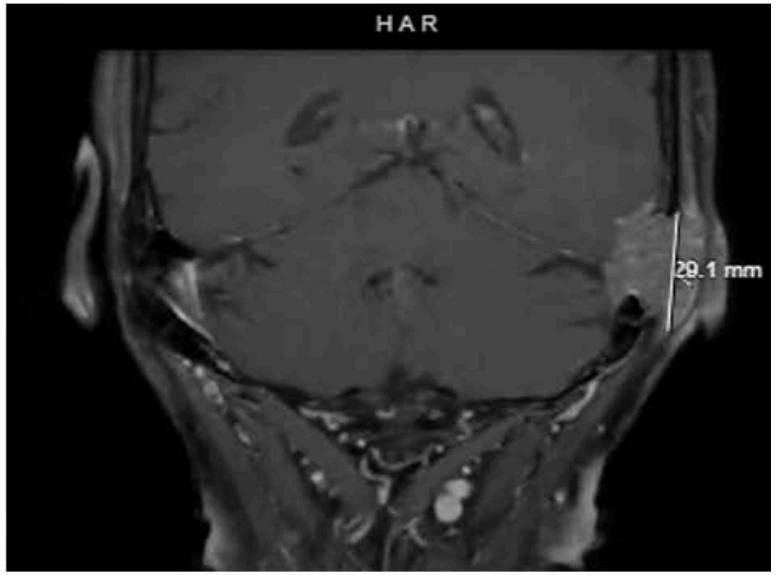
- **56 yo F with a history of low-grade acinic cell carcinoma of the left parotid s/p prior superfiical parotidectomy in 2022 with 3.8 cm tumor with dermal invasion and positive margins; -PNI/LVI, no adjuvant therapies.**
    - New left retroauricular mass without association pain
    - Biopsy: **low-grade acinic cell carcinoma**
        - Solid Tumor NGS panel: no identifiable molecular alterations
    - Exam:
        - Firm left postauricular mass overlying anterior mastoid tip
        - Residual marginal mandibular nerve paresis

Case presentation 2



Case presentation 2





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Case presentation 2

- Surgical resection and reconstruction:
  - Head and Neck Surgical Oncology:
    - Left subtotal salvage parotidectomy with preservation of facial nerve, left selective neck dissection (levels 1-3), partial auriculectomy, radical resection of postauricular skin, left radial forearm free flap, FTSG
  - Neurosurgery:
    - Left retrolabyrinthine resection, mesh cranioplasty

Case presentation 2

- Surgical pathology:
  - 3.5 cm low-grade acinic cell carcinoma with multifocal dermal invasion; +PNI, -LVI
  - Negative soft tissue margin except with tumor left over transverse dural venous sinus
  - 1/67 lymph nodes positive with ENE
  - Final staging: **pT4bN2M0**
- Tumor board recommendation: **adjuvant RT**

Case presentation 2

POD 4

Case presentation 2

- Post-treatment course:
    - PET CT with new lytic lesions in right iliac bone, FDG avid
        - **SBRT for presumed metastatic disease**

Conclusions

- Salivary malignancies demonstrate vast heterogeneity clinically and prognostically
- Typically require multidisciplinary care with lifelong surveillance particularly for high-grade disease
- Approach to facial nerve dependent on preoperative functionality and intraoperative findings with potential for restorative procedures

Comments?

THANK YOU!

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