AMSER Rad Path Case of the Month

51-year-old female presents with a mass in the right preauricular area

Nicholas Kisiel, MS-4 Lake Erie College of Osteopathic Medicine

Matthew Hartman, MD Allegheny Health Network - Radiology
Warren C. Swegal, MD Allegheny Health Network - ENT
Andrea Snitchler, DO Allegheny Health Network - Pathology
Mahreen Gilani, DO Allegheny Health Network - Pathology

Patient Presentation

- HPI: Patient is a 51-year-old female that presented to her family physician with a painless, hard mass in the right preauricular area.
- PMHx: Asthma, Class 2 Obesity, Hypothyroidism, Peritonsillar abscess
- SHx: Hysterectomy, Thyroidectomy, and Tonsillectomy and Adenoidectomy
- Physical Exam: Firm, painless mass in the right preauricular area.
- Labs: No pertinent findings

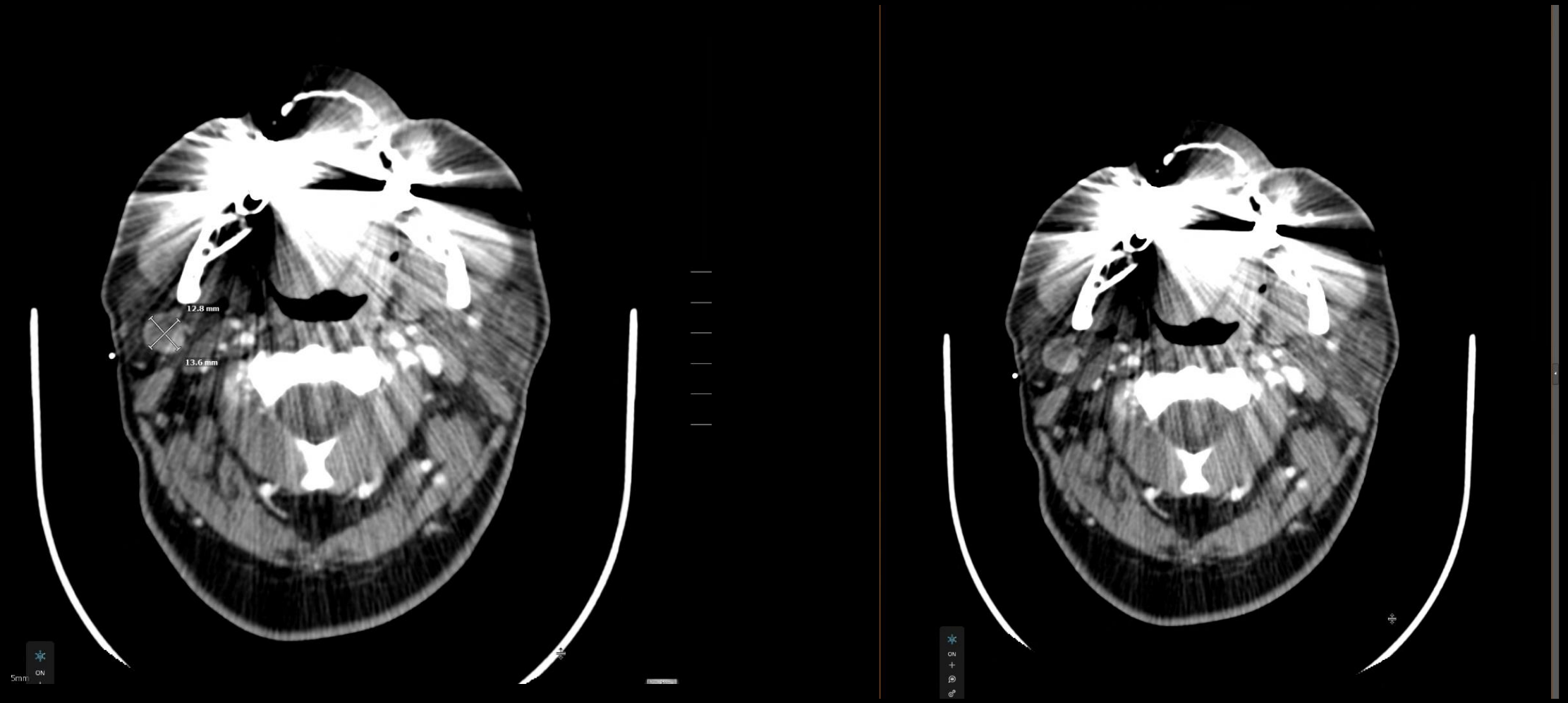
What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Parotid region mass	3149270	US neck	0 mSv O	0 mSv [ped] O	Usually appropriate
		MRI neck without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		CT neck with IV contrast	1-10 mSv ☢☢☢	0.3-3 mSv [ped] ☢☢☢	Usually appropriate
		Fluoroscopy sialography parotid	Varies	Varies	May be appropriate (Disagreement)
		MRI neck with parotid sialography without and with IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		MRI neck with parotid sialography without IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		MRI neck without IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		CT neck without IV contrast	1-10 mSv ☢☢☢	0.3-3 mSv [ped] ☢☢☢	May be appropriate
		Arteriography cervicocerebral	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate
		MRA neck without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		MRA neck without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		CT neck with parotid sialography	1-10 mSv ☢☢☢		Usually not appropriate
		CT neck without and with IV contrast	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate
		CTA neck with IV contrast	1-10 mSv ☢☢☢	0.3-3 mSv [ped] ☢☢☢	Usually not appropriate
		FDG-PET/MRI skull base to mid-thigh	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate
		FDG-PET/CT skull base to mid-thigh	10-30 mSv ☢☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate

This imaging modality was ordered by the Family physician

Findings (unlabeled)



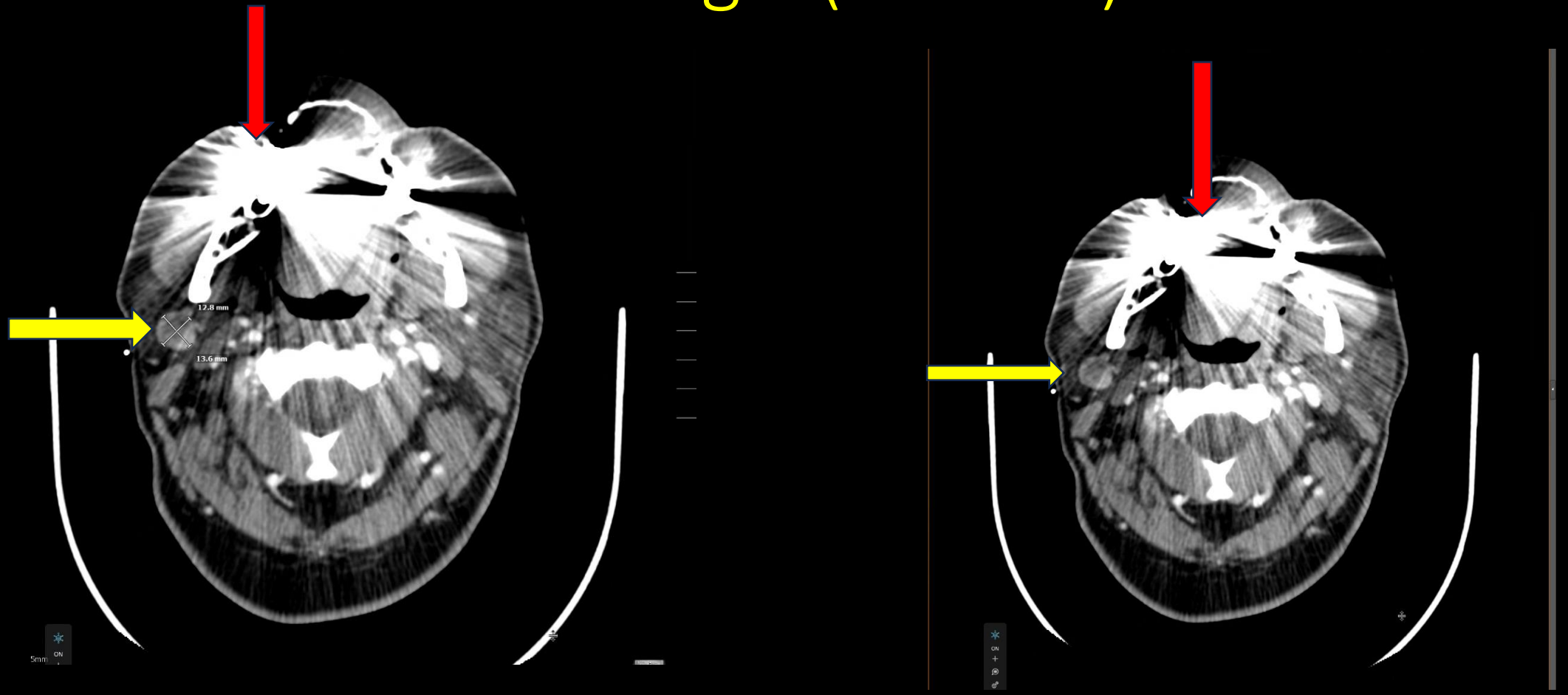
CT neck with contrast (axial view)

Findings (unlabeled)

Ultrasound-guided Fine Needle Aspiration

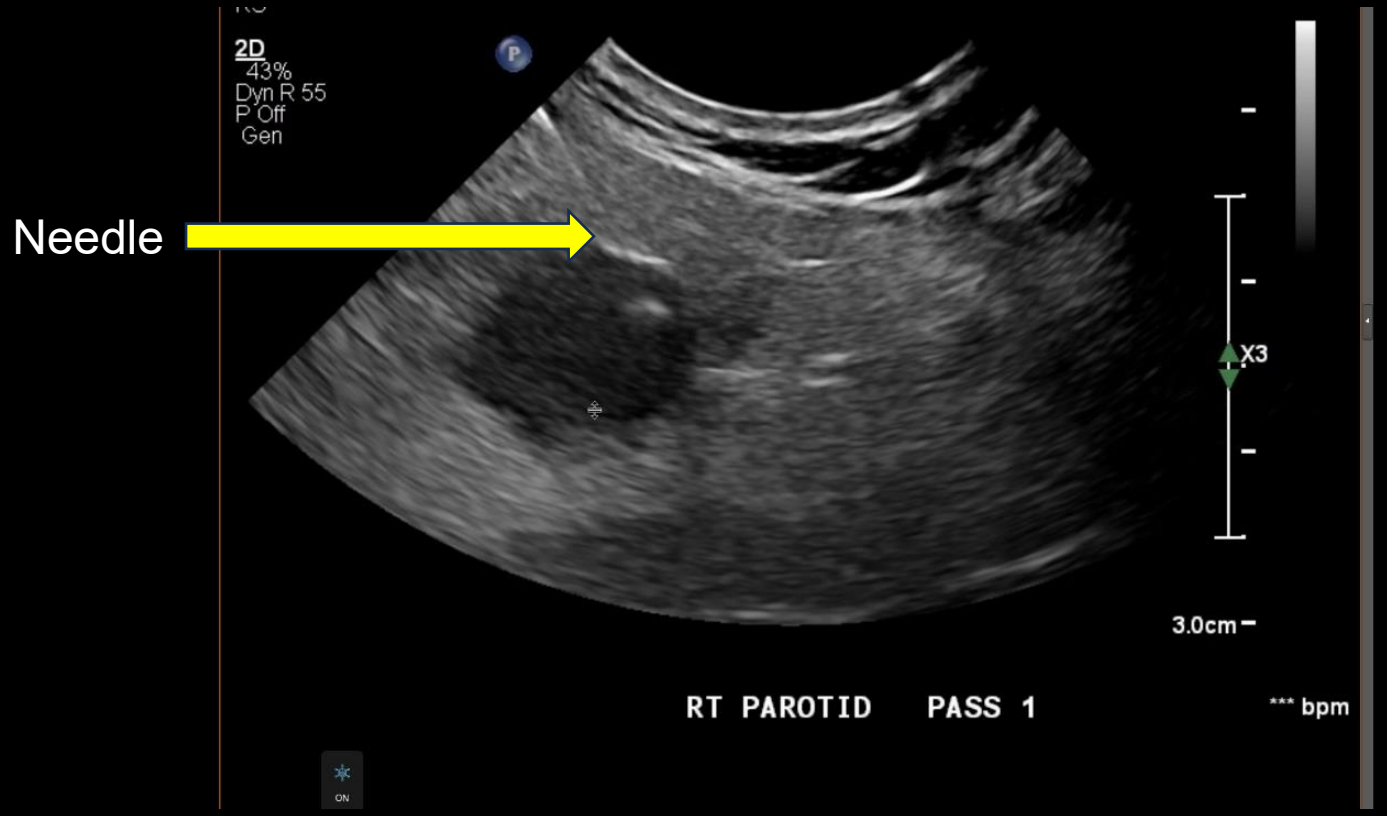
AMSER

Findings: (labeled)



Initial CT imaging showed a 1.4 x 1.3 cm solid enhancing mass in the superficial lobe of the right parotid gland, concerning for a primary salivary gland tumor (yellow arrow). A large amount of streak artifact present, due to metal dental implants (red arrow).

Findings: (labeled)

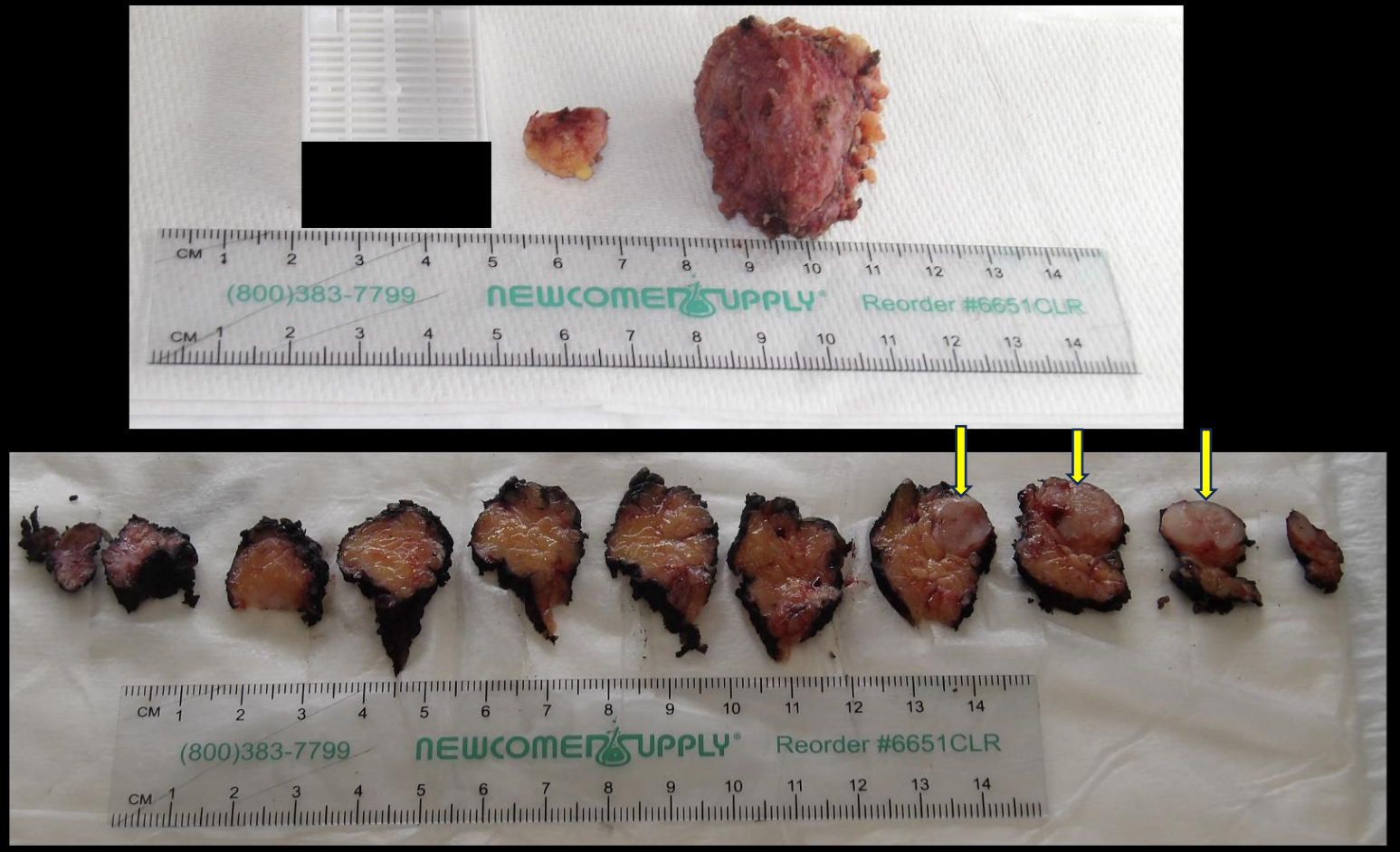


Initial US-guided fine needle aspiration (FNA) was non-diagnostic. Repeat US-guided FNA cytologic analysis revealed atypia of undetermined significance, so parotidectomy was determined to be the best next step.

Differential Diagnosis

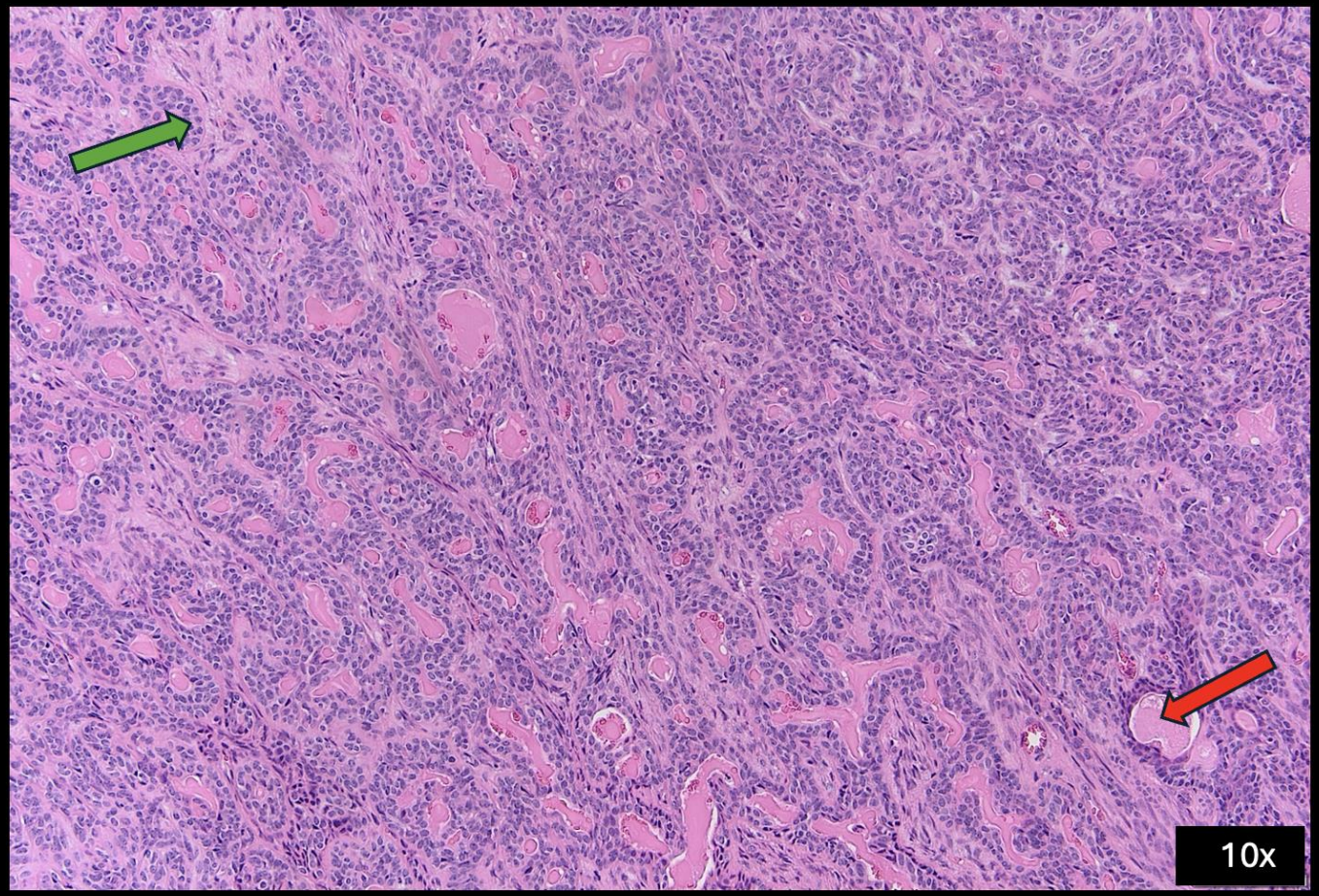
- Pleomorphic adenoma
- Lymphomatous papillary cystadenoma
- Basal cell adenoma
- Mucoepidermoid carcinoma
- Adenoid cystic carcinoma
- Basal cell adenocarcinoma

Pathology (Gross)



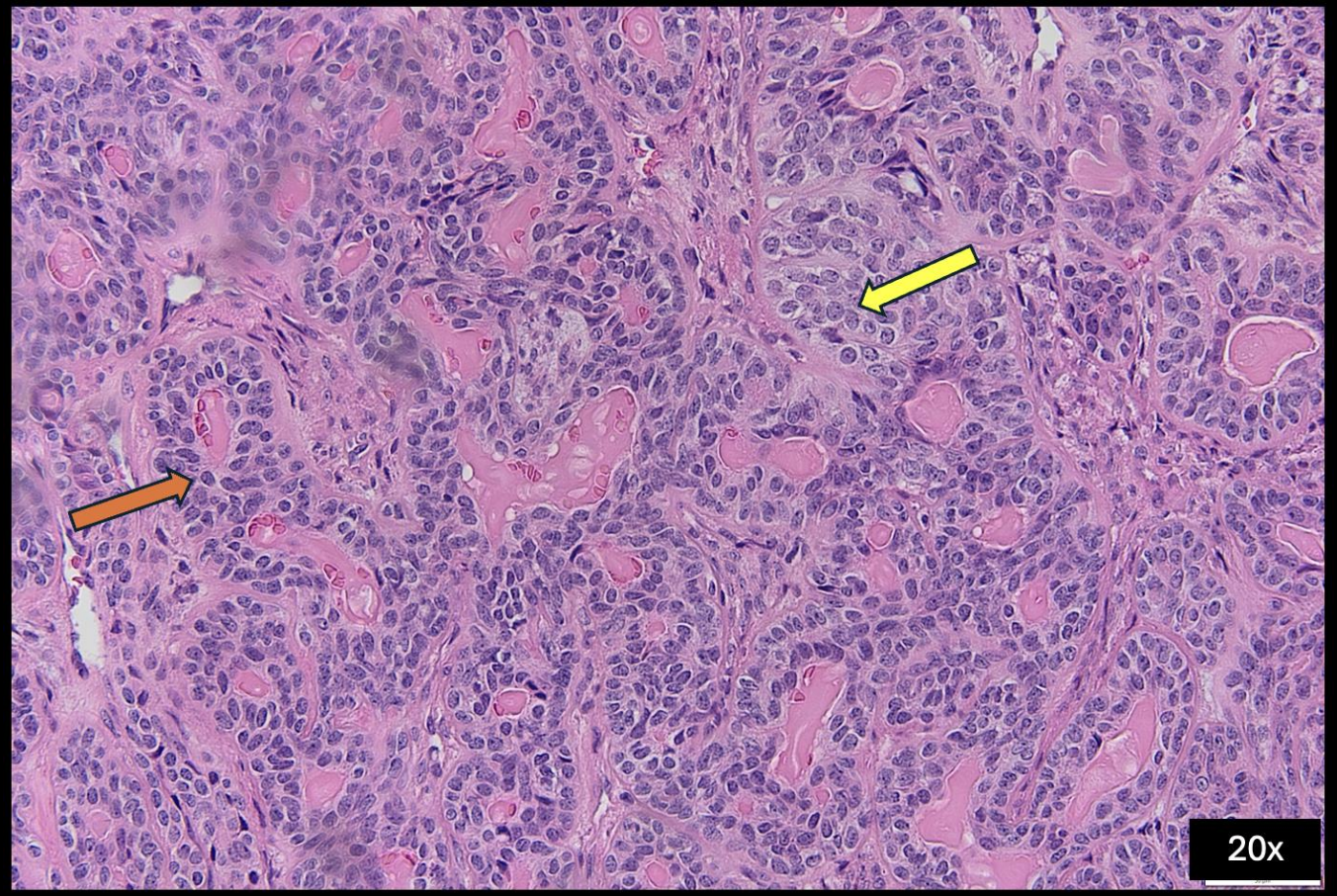
Gross Description: Tan-pink, lobulated, firm parotid gland with focal areas of hemorrhage that measures 4.2 x 3.0 x 2.4 cm and weighs 11 g. The cut surfaces reveal a single tan-pink to white, firm, well-defined lesion that measures 1.5 x 1.3 x 1.2 cm (yellow arrows).

Pathology (Micro)



Tubulotrabecular morphological pattern separated by a cellular stroma. Note the elongated trabeculae interconnected with each other (green arrow) and the tubules lined with ductal cells filled with secretions (red arrow).

Pathology (Micro)



Two types of basaloid cells make up this benign neoplasm. There are smaller cells at the periphery of the tumor nests with scant cytoplasm and oval basophilic nuclei (orange arrow) and larger cells in the interior of the tumor nests with more cytoplasm and pale-staining nuclei (yellow arrow).

Final Dx:

Basal Cell Adenoma of the Parotid Gland

Case Discussion

- Basal Cell Adenoma
  - A rare, benign epithelial tumor that occurs in salivary glands, most commonly in the parotid gland
- Epidemiology
  - Makes up about 2% of all salivary gland tumors and 4% of benign parotid tumors specifically. [2]
  - Predominantly occur in women, at a rate of 2:1
  - Most commonly occur after the age of 50 [1]
- Presentation
  - A painless, firm, mobile, slow-growing, asymptomatic mass [4]
  - Mainly present in the superficial lobe of the parotid gland

Case Discussion

- Pathology
  - Two types of tumor cells: basaloid cells with basal cells and luminal cells
  - Variants include solid, trabecular, tubular, and membranous (mixtures of two is common)
  - Tubular-trabecular
    - Trabeculae present that may interconnect to create a reticular pattern[4]
    - Numerous tubules consisting of a central lumen and an outer single or double layered lining of basaloid cells[4]
- Radiology
  - More likely to have smoother edges when > 1cm, compared to pleomorphic adenomas undulating edges at this size [3]
  - CT
    - Small, mostly < 5cm round or oval mass with distinct margins and homogenous contrast enhancement[2]

Case Discussion

- Radiology (continued)
  - MRI
    - Basal cell adenomas may have lower ADC values compared to pleomorphic adenomas[3]
    - Basal cell adenomas may appear more cystic as well.[3]
- Prognosis
  - Recurrences rates are almost non-existent in patients with tubular-trabecular and solid pattern variants; 2% for the rest.
  - Malignant transformation is most common in the membranous variant (~4%)[4]
- Treatment
  - Surgical resection with a cuff of normal salivary tissue [4]
  - Total parotidectomy for membranous variant due to higher risk of transformation

References:

1. Bhat A, Rao M, Geethamani V, Shetty AC. Basal cell adenoma of the parotid gland: Cytological diagnosis of an uncommon tumor. *Journal of Oral and Maxillofacial Pathology : JOMFP*. 2015;19(1):106. doi:https://doi.org/10.4103/0973-029X.157211
2. Chiu NC, Wu HM, Chou YH, et al. Basal Cell Adenoma Versus Pleomorphic Adenoma of the Parotid Gland: CT Findings. *American Journal of Roentgenology*. 2007;189(5):W254-W261. doi:https://doi.org/10.2214/ajr.07.2292
3. Knipe H, Bickle I. Basal cell adenoma. *Radiopaedia.org*. August 1, 2019. doi:https://doi.org/10.53347/rid-70088
4. Zhao X, Wei S. Primary Salivary Gland Neoplasms: Basal Cell Adenoma. *PathologyOutlines.com*. April 8, 2021. https://www.pathologyoutlines.com/topic/salivaryglandsbasalcelladenoma.html

AMSER