

AMSER Rad Path Case of the Month:

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Patient Presentation

- 35 year old female with a history of obesity and type 2 diabetes mellitus presents with a 3 month history of non-healing left tongue ulcer.
 - Has left tongue pain and left otalgia
 - Denies dysphagia, odynophagia, voice changes, breathing difficulty, cough, hemoptysis, weight loss
 - No history of tobacco or alcohol use
 - No known family history of malignancy

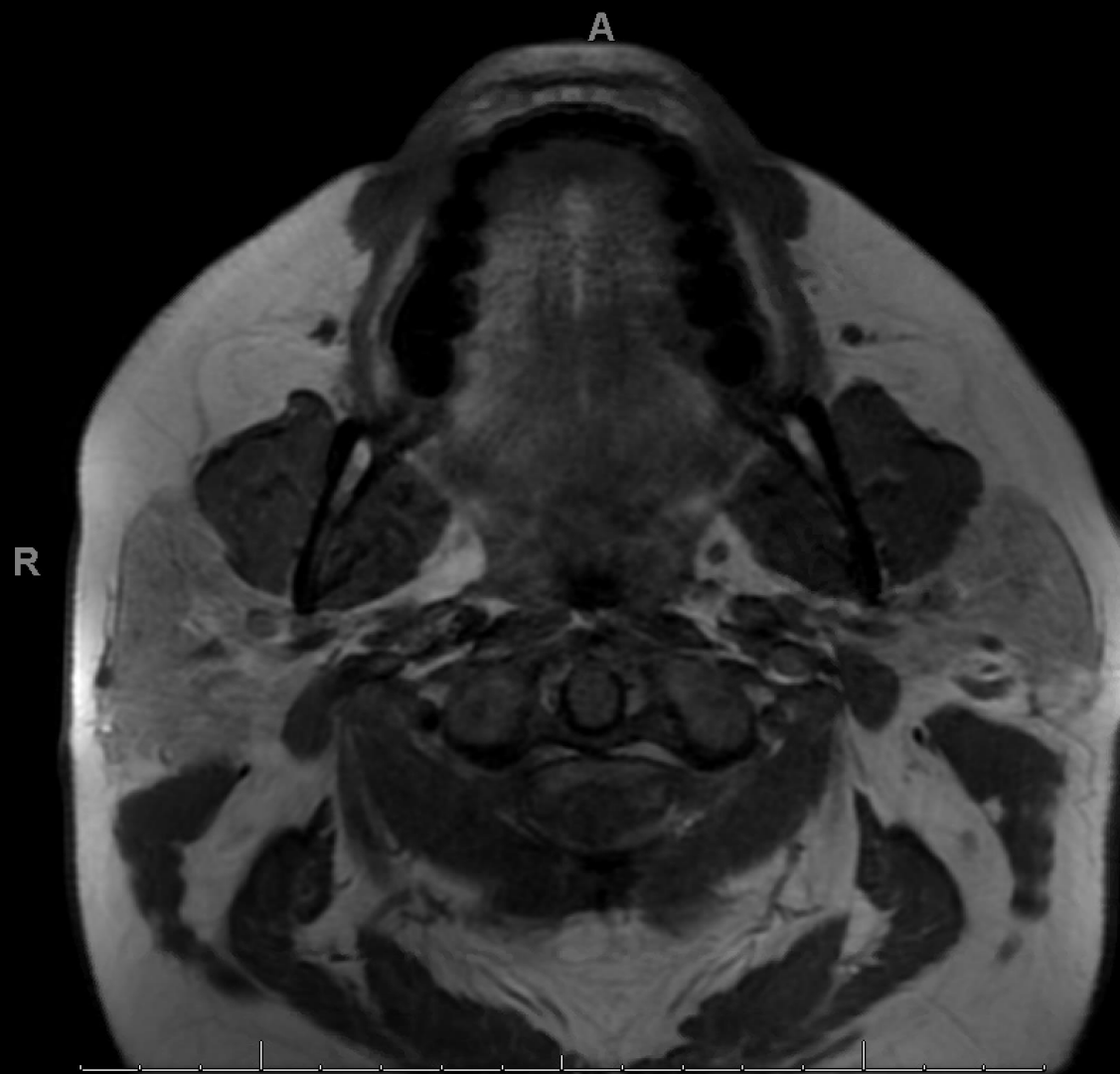
ACR Appropriateness Criteria

- CT provides better spatial resolution and reduced motion artifact; therefore most useful for assessing tumors in hypopharynx¹
- MRI provides better soft-tissue resolution and is preferred for tumors of the tongue, superficial lesions, and bone marrow invasion²

Variant 1: Nonpulsatile neck mass(es). Not parotid region or thyroid. Initial imaging.		
Procedure	Appropriateness Category	Relative Radiation Level
CT neck with IV contrast	Usually Appropriate	⊗ ⊗ ⊗
MRI neck without and with IV contrast	Usually Appropriate	○
MRI neck without IV contrast	May Be Appropriate	○
US neck	May Be Appropriate	○
CT neck without IV contrast	May Be Appropriate	⊗ ⊗ ⊗
CT neck without and with IV contrast	Usually Not Appropriate	⊗ ⊗ ⊗
CTA neck with IV contrast	Usually Not Appropriate	⊗ ⊗ ⊗
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	⊗ ⊗ ⊗ ⊗
FDG-PET/MRI skull base to mid-thigh	Usually Not Appropriate	⊗ ⊗ ⊗
MRA neck without and with IV contrast	Usually Not Appropriate	○
Arteriography cervicocerebral	Usually Not Appropriate	⊗ ⊗ ⊗
MRA neck without IV contrast	Usually Not Appropriate	○

MRI Neck Soft Tissue WWO

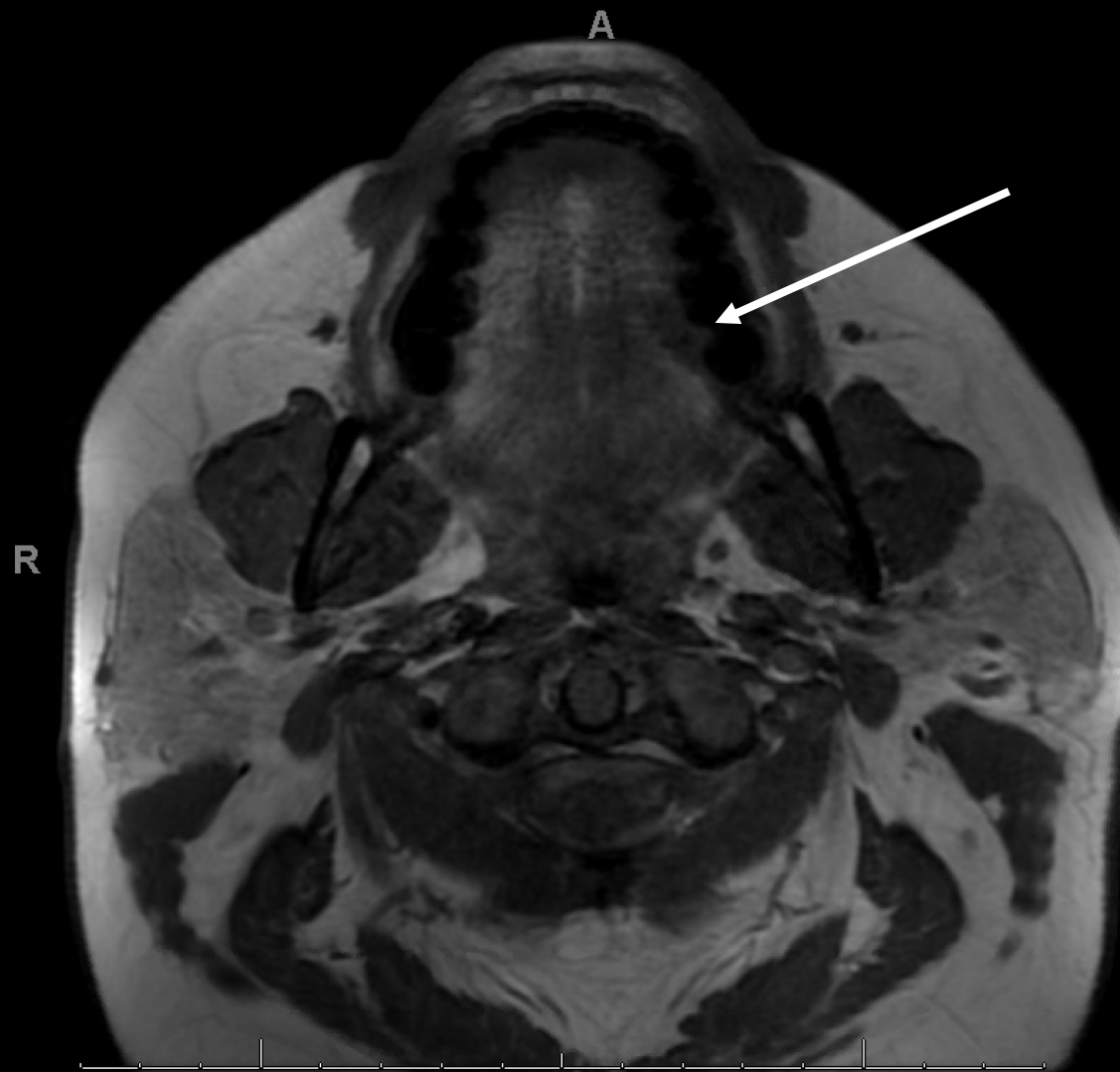
- Important to obtain:
 - noncontrast T1-weighted
 - contrast-enhanced T1-weighted with fat suppression
 - T2-weighted images with fat suppression or short-tau inversion recovery (STIR) images



T1-weighted, non-contrast



T1-weighted, post-contrast



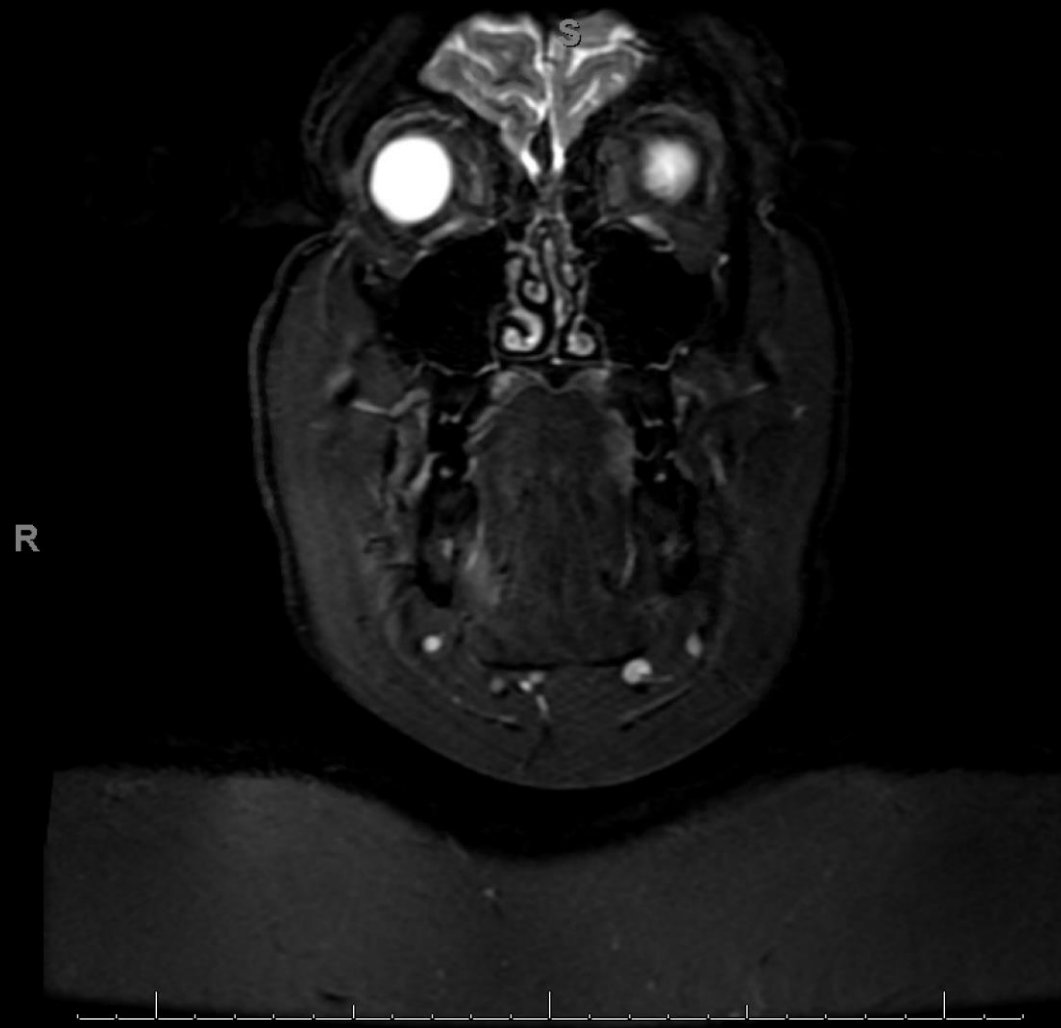
T1-weighted, non-contrast



T1-weighted, post-contrast
- Note hyperintensity in the left lateral tongue suggesting contrast uptake



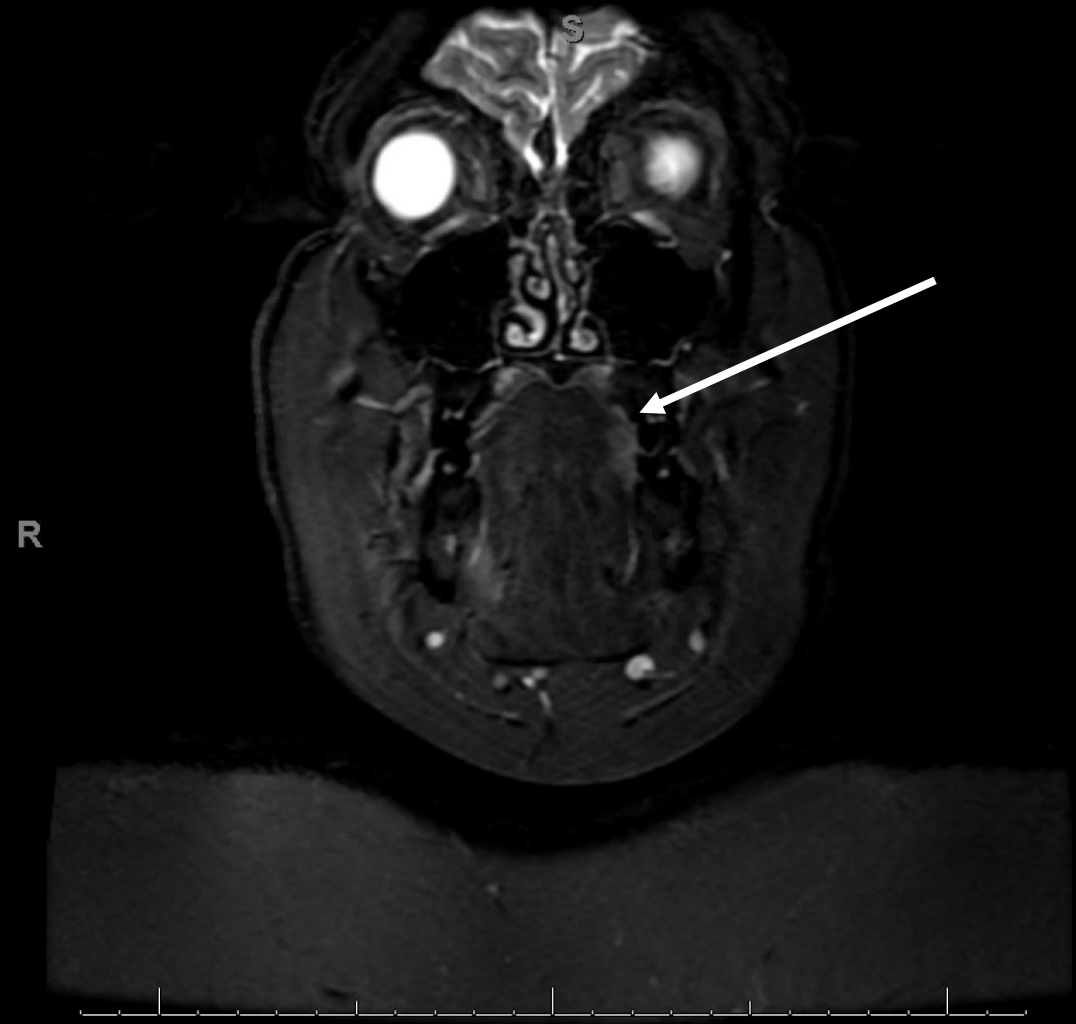
T2-weighted with fat suppression (axial)



T2-weighted with fat suppression (coronal)



T2-weighted with fat suppression (axial)
- Note hyperintensity in the left lateral tongue suggesting edema
- Measured 12.5 x 5.8 mm in the axial plane



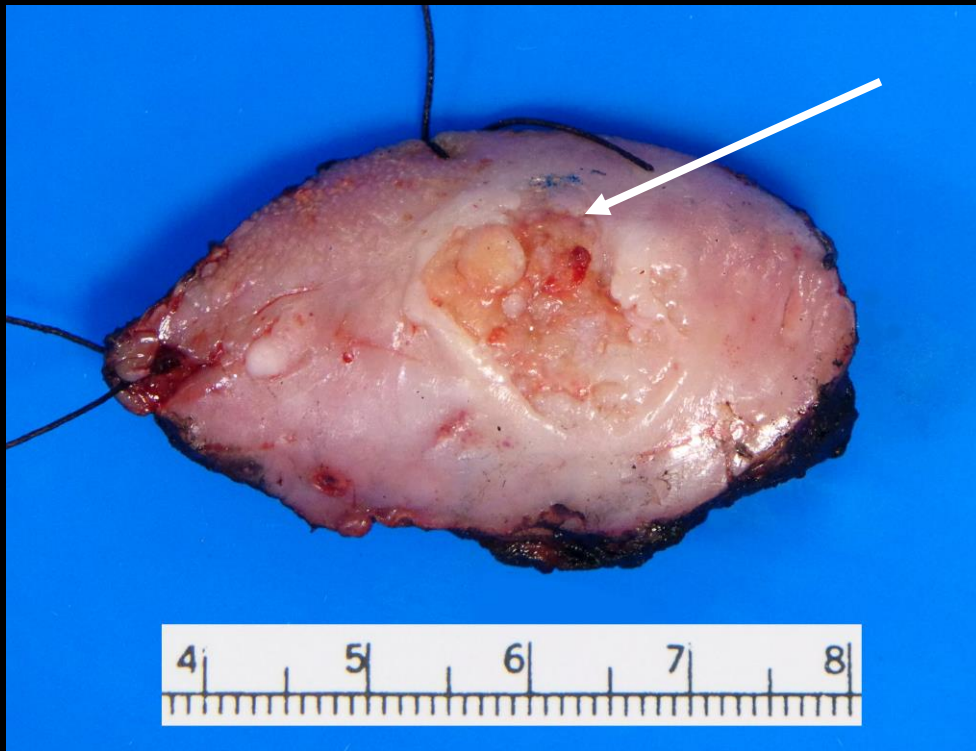
T2-weighted with fat suppression (coronal)
- Lesion measured 9.2 mm craniocaudally

Differential Diagnosis

- Leukoedema
- Recurrent aphthous stomatitis
- Cheilitis
- Infectious (HSV, candidiasis, etc)
- Immune (oral lichen planus, SLE, pemphigus vulgaris)
- Steven-Johnson syndrome/toxic epidermal necrolysis
- Neoplastic(erythroplakia, oral hairy leukoplakia, oral squamous cell carcinoma)
 - Biopsy with suspicion for SCC indicated if³:
 - Red or red-white lesion
 - Ulcer
 - Lump
 - Especially in combination or if indurated

Pathology (gross)

- Mucosal surface lesion



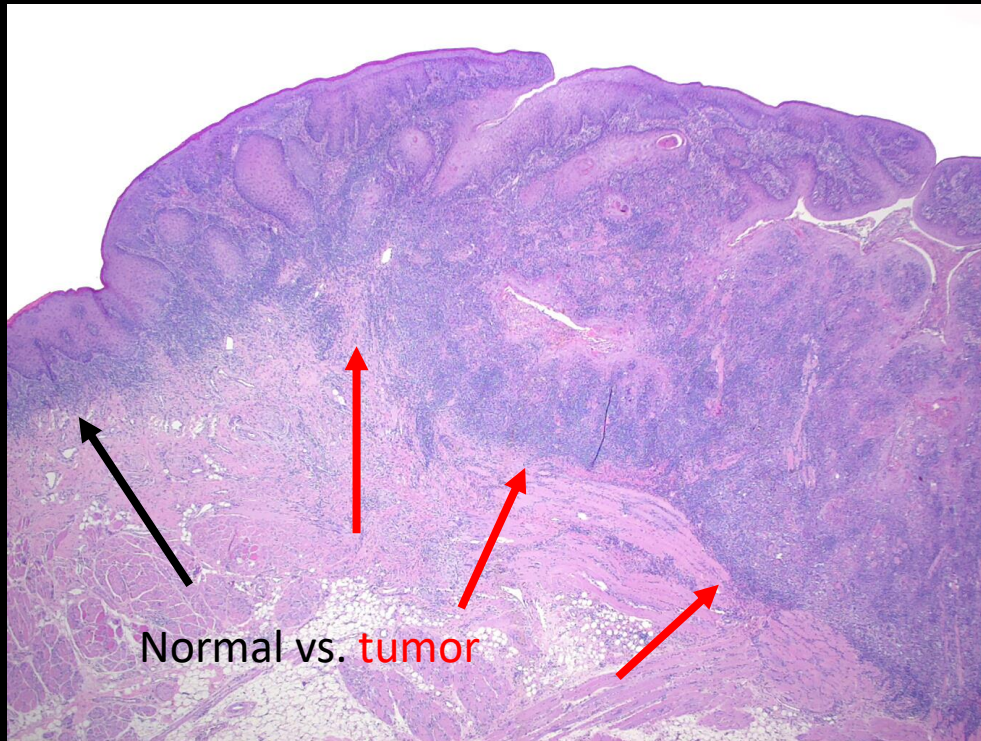
Intact specimen



Cut section of lesion

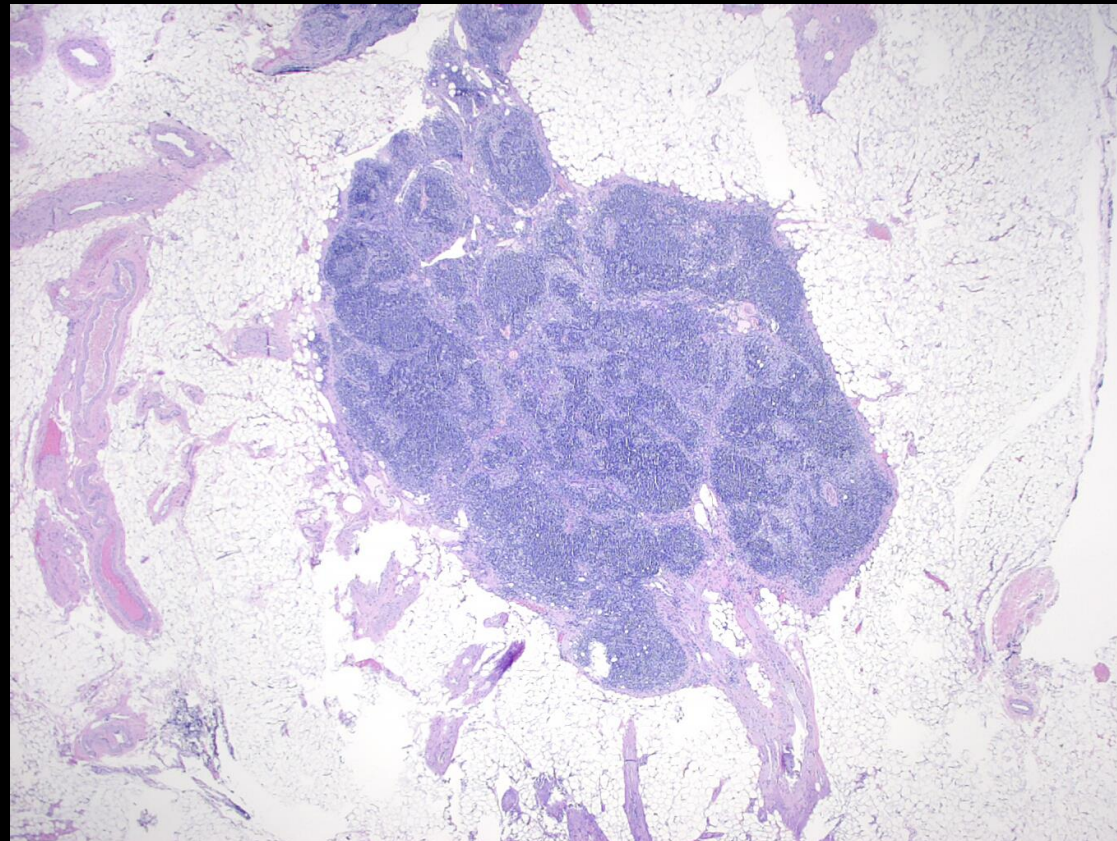
Pathology

- Greater keratinization (as seen by red arrows) → more well-differentiated
- p16/HPV-negative



Pathology

- Lymph nodes were negative (example negative node shown below)



Diagnosis

- Primary squamous cell carcinoma of border of tongue
 - Staging: pT2N0

Case Discussion

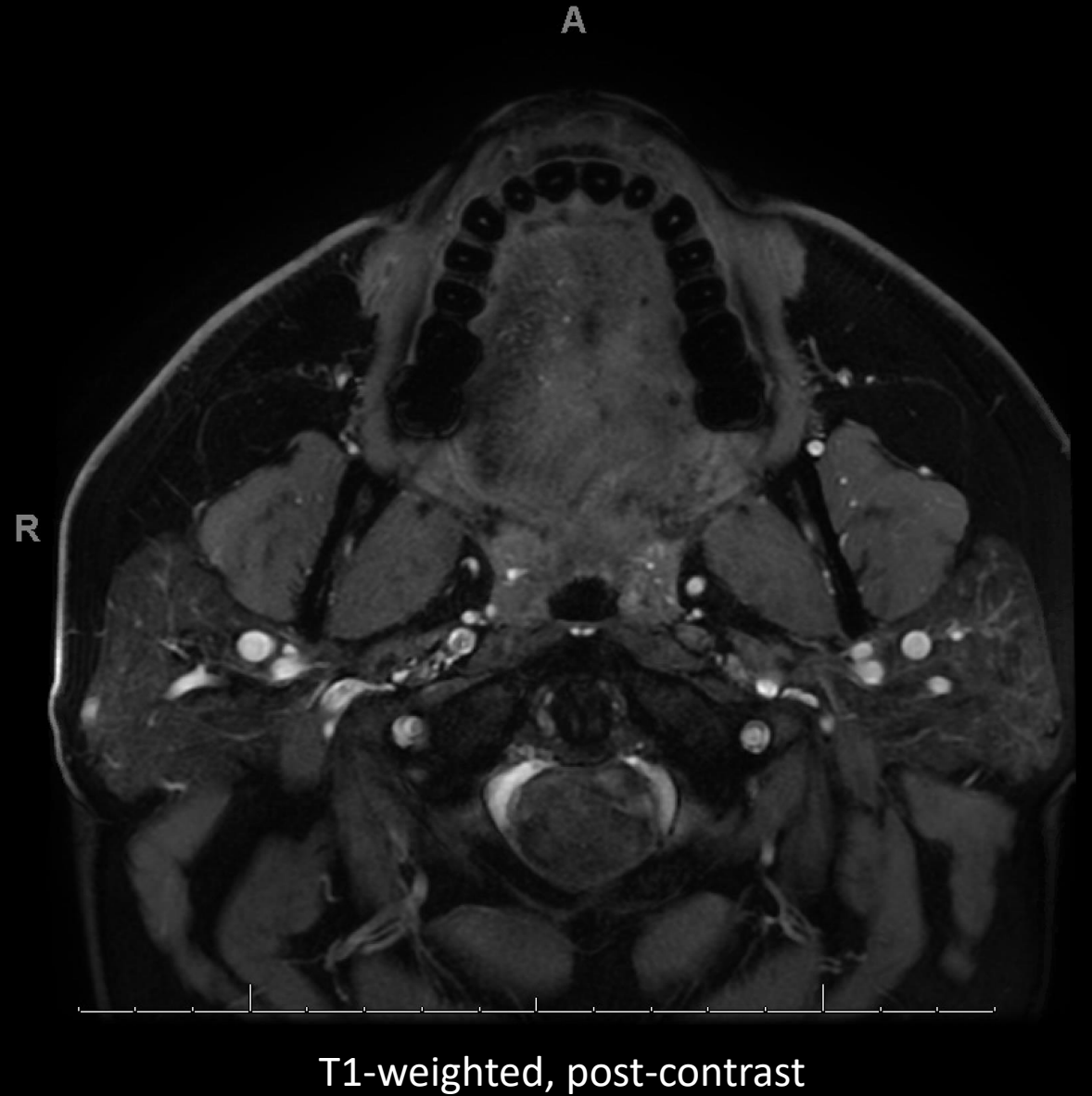
- Risk factors for oral squamous cell carcinoma
 - Smoked or smokeless (eg chewing) tobacco (incidence decreasing)⁴
 - Alcohol
 - HPV infection (incidence increasing)⁴
 - Other: betel nut chewing, radiation, vitamin deficiencies, periodontal disease, immunosuppression
- Significant symptoms
 - Referred otalgia (high index of suspicion)
 - Oral pain, non-healing ulcers, dysphagia, odynophagia, bleeding
- SCC is 90-95% of cancers in oral cavity and larynx

Management

1. Diagnose with history + imaging (CT or MRI) *concurrent with* biopsy (fine needle aspiration if in the neck, incisional if obvious mucosal lesion)
2. Assess for neck metastases
 - Most sensitive is still neck dissection
 - PET and PET/CT are also useful but have not yet replaced neck dissection⁵
 - Most useful as restaging scans/to assess for occult metastases elsewhere
 - CT outperforms MRI for assessing nodes
3. Treatment involves weighing risks and benefits of surgery (TORS) vs radiochemotherapy (often cisplatin-based) given the delicate structures in the oropharynx and neck
 - Surgery often indicated if no nodal involvement + potential for absolute cure

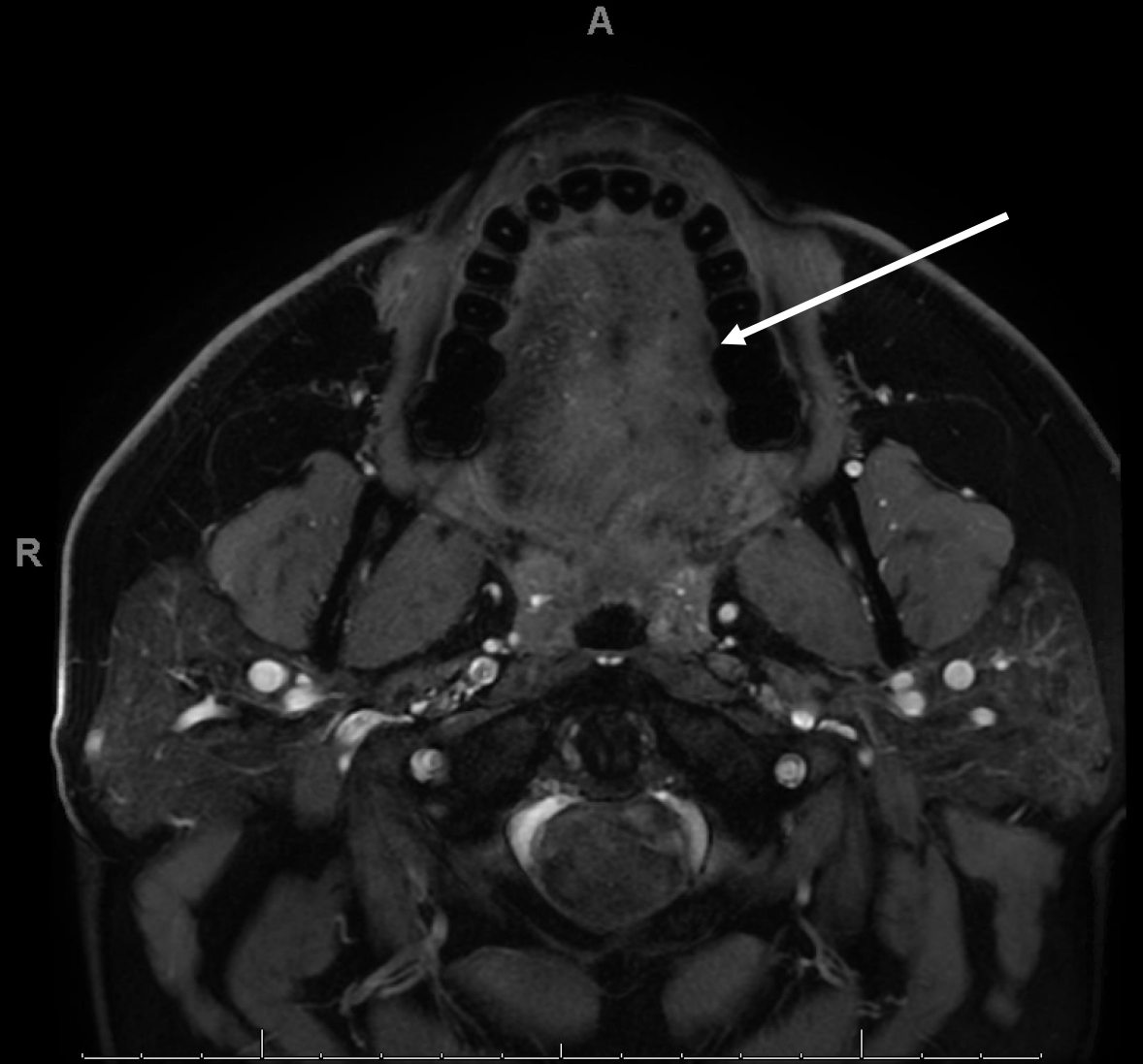
Management

- The patient underwent left partial glossectomy and left neck dissection
- Repeat MRI at 6 months



Management

- The patient underwent left partial glossectomy and left neck dissection
- Repeat MRI at 6 months showed no definite evidence of gross residual tumor and no significant left cervical lymphadenopathy.



T1-weighted, post-contrast
- Lack of hyperintensity in left tongue after contrast administration suggests no gross residual tumor

Radiologic and Pathologic Characteristics

- Imaging

- Useful before treatment to assess depth of invasion and spread to local nodes
 - Guides surgical approach and need for chemotherapy or radiation
- CT: anatomic distortion, enhancement with contrast
 - Assess neck and chest
- MRI: anatomic distortion, T2 hyperintensity, T1 post-contrast enhancement
- PET plays a role in assessing occult metastases if suspicion is high

- Pathology

- Biopsy obtained shortly after imaging
- Degree of keratinization important
- p16 immunohistochemistry to assess for HPV; recommended to be done in all oral SCC as HPV+ has better prognosis
 - Specificity 85-95%, sensitivity near 100% (using 70% staining cutoff)⁶

References

- ¹ Prehn, R.B., Pasic, T.R., Harari, P.M., Brown, W.D., & Ford, C.N. (1998). Influence of computed tomography on pretherapeutic tumor staging in head and neck cancer patients. *Otolaryngol Head Neck Surg*, 119(6):628.
- ² Sakata, K., Hareyama, M., Tamakawa, M., Oouchi, A., Sido, M., Nagakura, H., Akiba, H., Koito, K., Himi, T., & Asakura, K. (1999). Prognostic factors of nasopharynx tumors investigated by MR imaging and the value of MR imaging in the newly published TNM staging. *Int J Radiat Oncol Biol Phys*, 43(2):273.
- ³ Kalavrezos, N. & Scully, C. (2015). Mouth Cancer for Clinicians Part 6: Potentially Malignant Disorders. *Dent Update*, 42(9):866.
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- ⁵ Lonneux, M., Hamoir, M., Reychler, H., Maingon, P., Duvillard, C., Calais, G., Bridji, B., Digue, L., Toubreau, M., & Grégoire, V. (2010). Positron emission tomography with [18F]fluorodeoxyglucose improves staging and patient management in patients with head and neck squamous cell carcinoma: a multicenter prospective study. *J Clin Oncol*, 28(7):1190.
- ⁶ Lewis, J.S., Beadle, B., Bishop, J.A., Chernock, R.D., Colasacco, C., Lacchetti, C., Moncur, J.T., Rocco, J.W., Schwartz, M.R., Seethala, R.R., Thomas, N.E., Westra, W.H., & Faquin, W.C. (2018). Human Papillomavirus Testing in Head and Neck Carcinomas: Guideline From the College of American Pathologists. *Arch Pathol Lab Med*, 142(5):559-597.