AMSER Case of the Month
April 2019

27 y/o M with 9 days of worsening of left lower jaw dental pain and neck swelling

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Patient Presentation

- HPI: 27 y/o M with 9 days of worsening left lower jaw dental pain and neck swelling. Pt first seen in ED on 2/3 for symptoms and was given PCN. Symptoms continued to worsen and was then seen at the abuse WCA ED where he was given amoxicillin, ibuprofen and prednisone. Symptoms worsened until he presented to the ED on 2/9 with continued left jaw pain, markedly increased swelling of his left lower jaw and neck, trismus, trouble speaking, and difficulty swallowing his saliva. Denied difficulty breathing.
- ROS: Positive for dental problem and facial swelling; Negative for chills and fever, SOB, CP, N,V.
- PMH: none
- PSH: none
- SHx: Current every day smoker

Patient Physical Exam

HEENT: Head was normocephalic. Ear TMs were normal bilaterally. Throat- pt had difficulty opening his mouth. Tongue- seemed a little elevated; left peritonsillar area was markedly swollen. There were no gum abscesses. Neck- no stridor. Markedly swollen mental and mandibular and left side of neck areas. Areas were indurated and nonfluctuant.

Rest of physical exam WNL

Vitals WNL (temp 98.3)

Labs - WBC: 10.95; RBC: 3.92; Hb: 12.0; Hct: 35.5

Differential Diagnosis

- Retropharyngeal abscess
- Peritonsillar abscess
- Epiglottitis
- Squamous cell carcinoma
- Ludwig’s angina

What Imaging should be ordered?

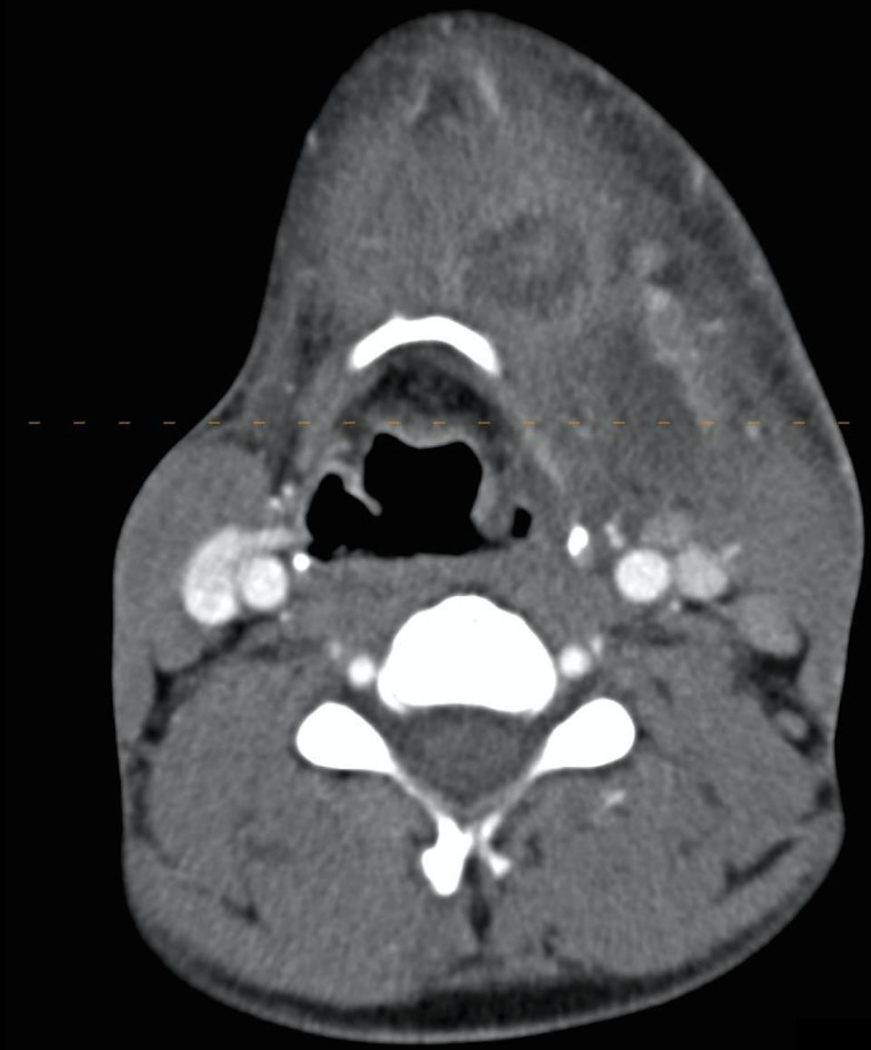
ACR Appropriateness Criteria

Variant 1: **Nonpulsatile neck mass(es). Not parotid region or thyroid. Initial imaging.**

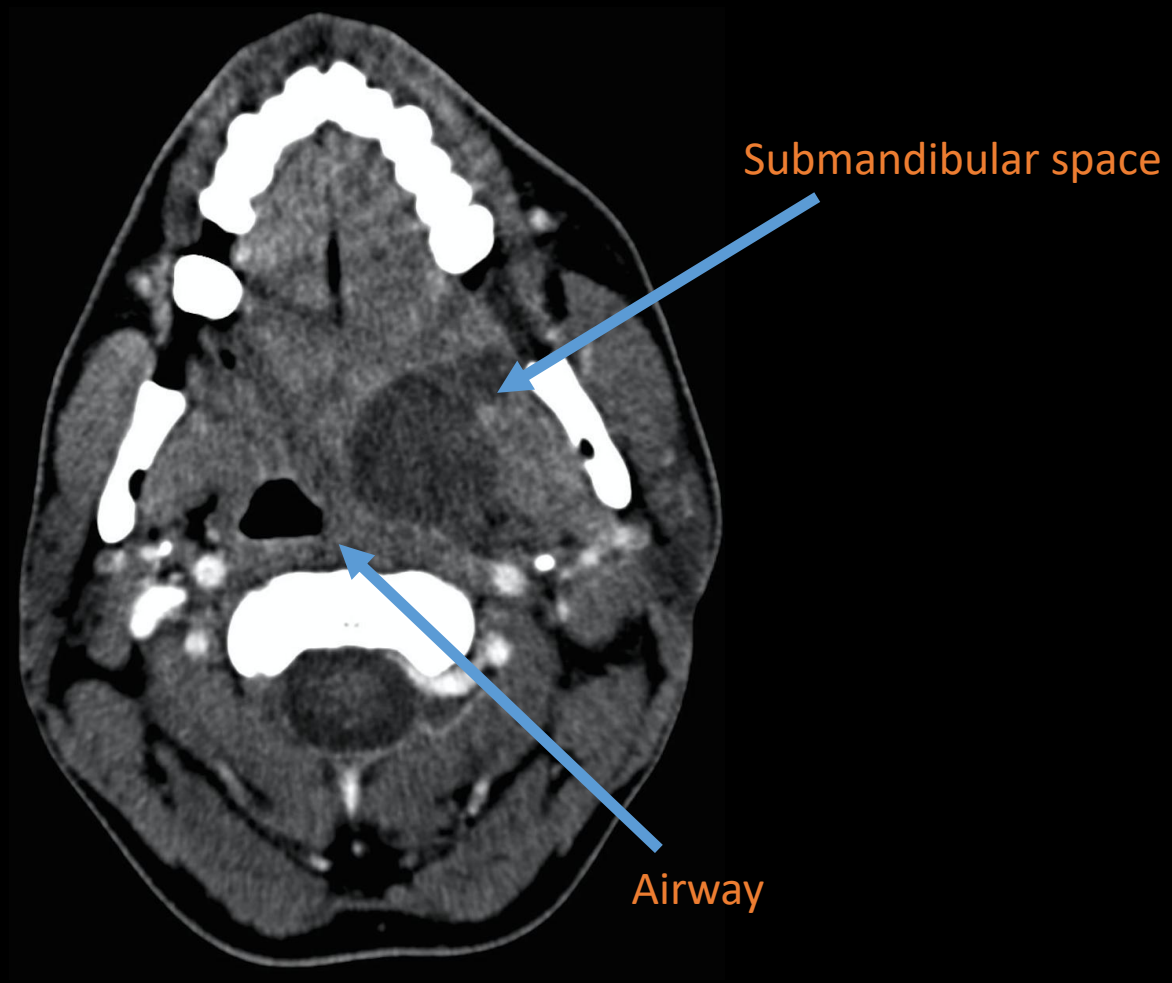
Procedure	Appropriateness Category	Relative Radiation Level
CT neck with IV contrast	Usually Appropriate	☢☢☢
MRI neck without and with IV contrast	Usually Appropriate	O
MRI neck without IV contrast	May Be Appropriate	O
US neck	May Be Appropriate	O
CT neck without IV contrast	May Be Appropriate	☢☢☢
CT 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	O
Arteriography cervicocerebral	Usually Not Appropriate	☢☢☢
MRA neck without IV contrast	Usually Not Appropriate	O

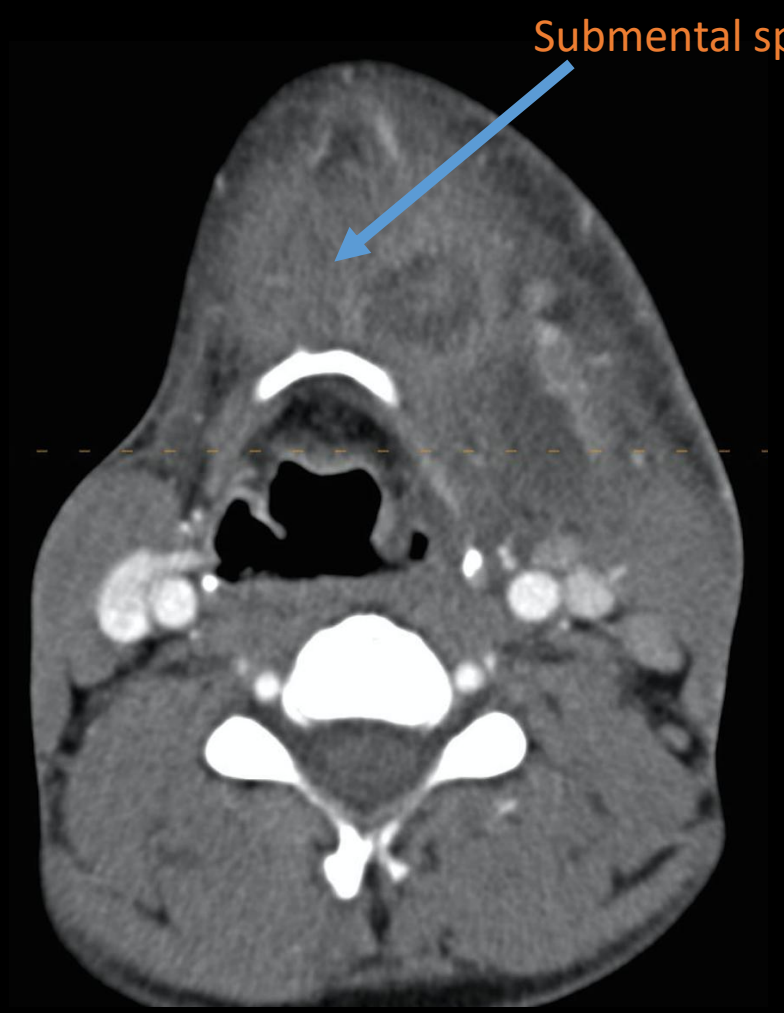
This imaging modality was ordered by the ED physician

CT Soft Tissue Neck w Contrast (unlabeled)



CT Soft Tissue Neck w Contrast (labeled)

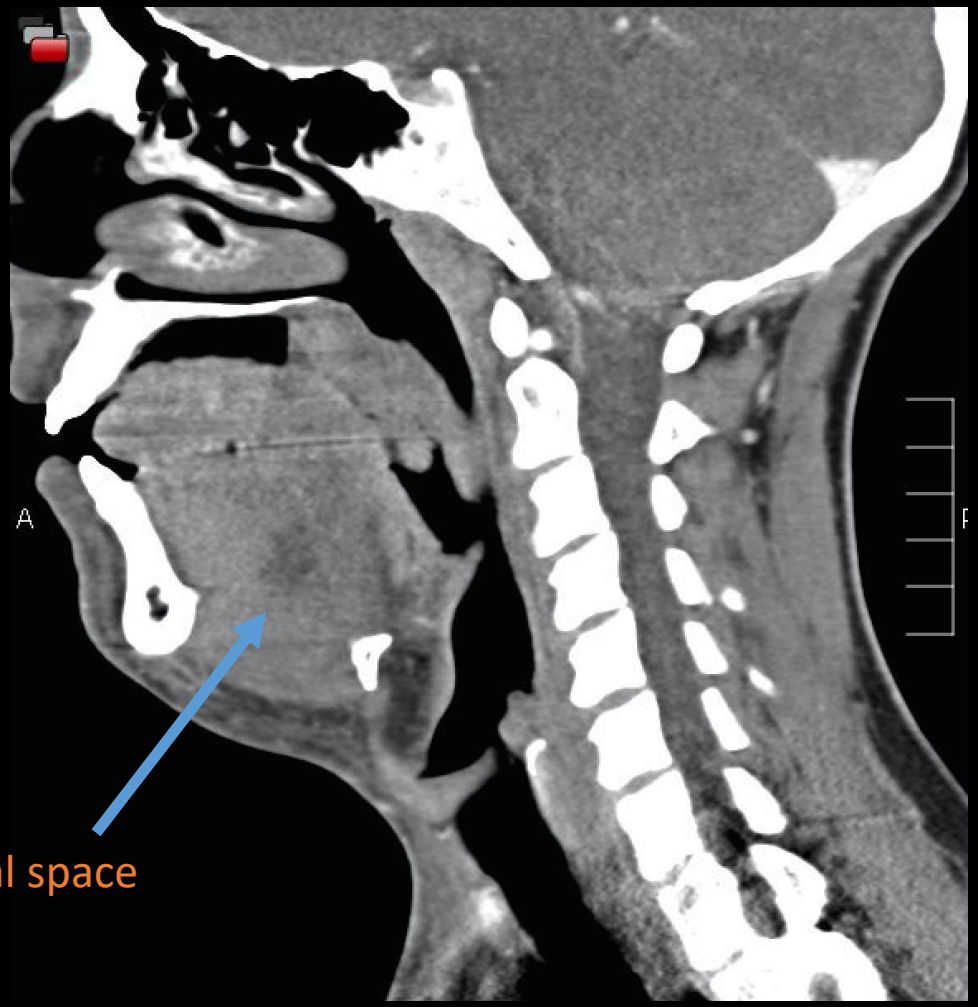


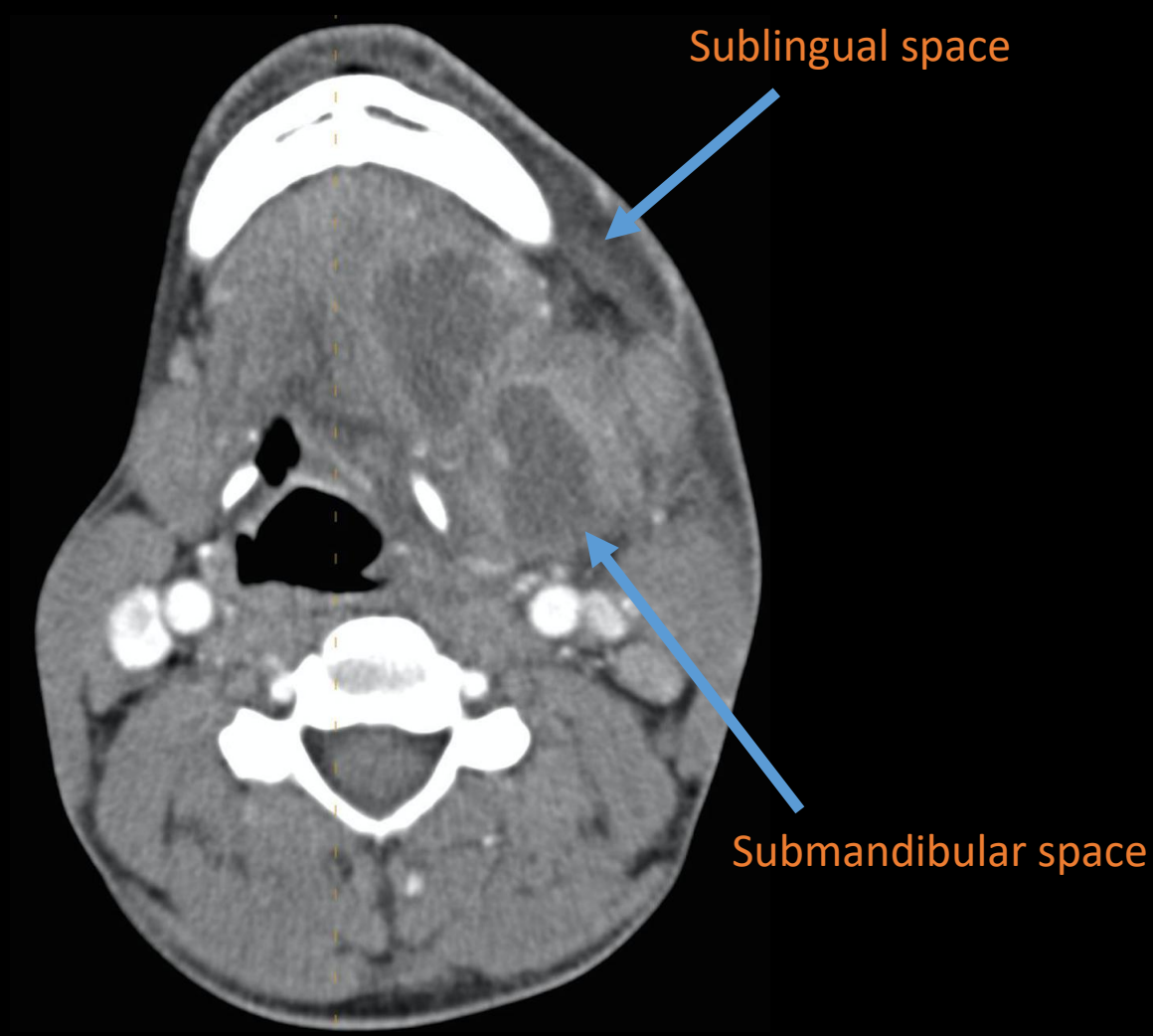


Left: Axial CT image shows a hypodense rim enhancing fluid collection centered in the left tonsillar pillar extending to the left submandibular space. **Right:** Axial CT image showing extension to the left submental space. There is mild rightward deviation of the airway on both images with mild airway narrowing.

CT Soft Tissue Neck w Contrast (unlabeled)

CT Soft Tissue Neck w Contrast (labeled)





Left: Sagittal CT image showing hypodense fluid collection in the left sublingual space. **Right:** Axial CT image showing rim enhancing fluid collections in the left submandibular and sublingual spaces. Again seen is rightward deviation and mild narrowing of the airway.

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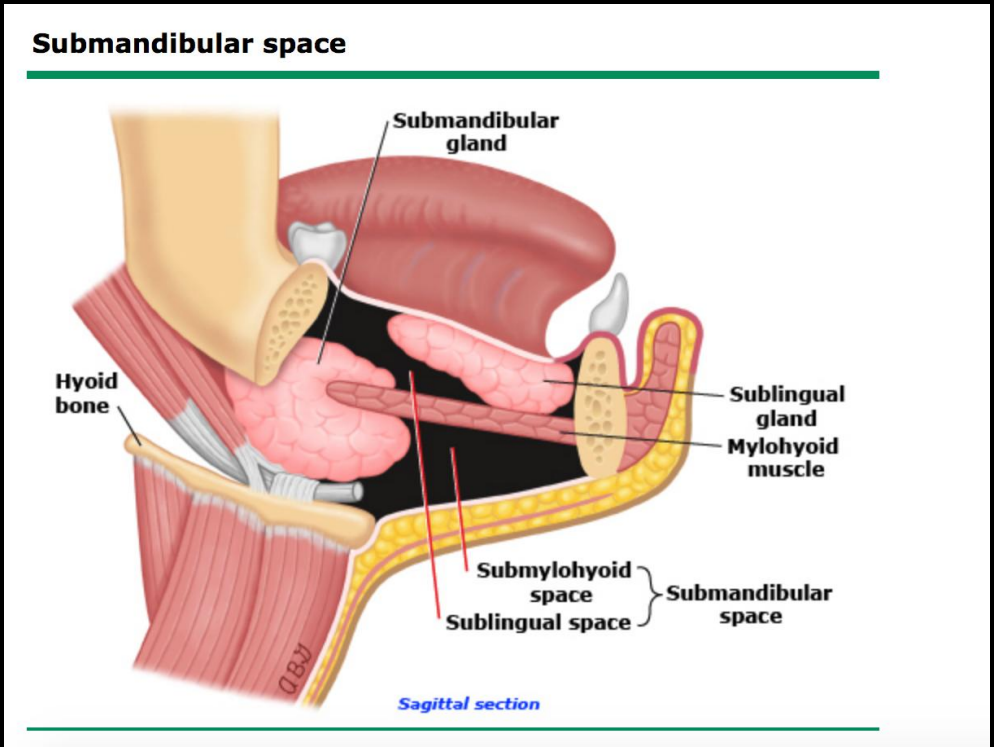
Final Diagnosis:

Ludwig’s Angina

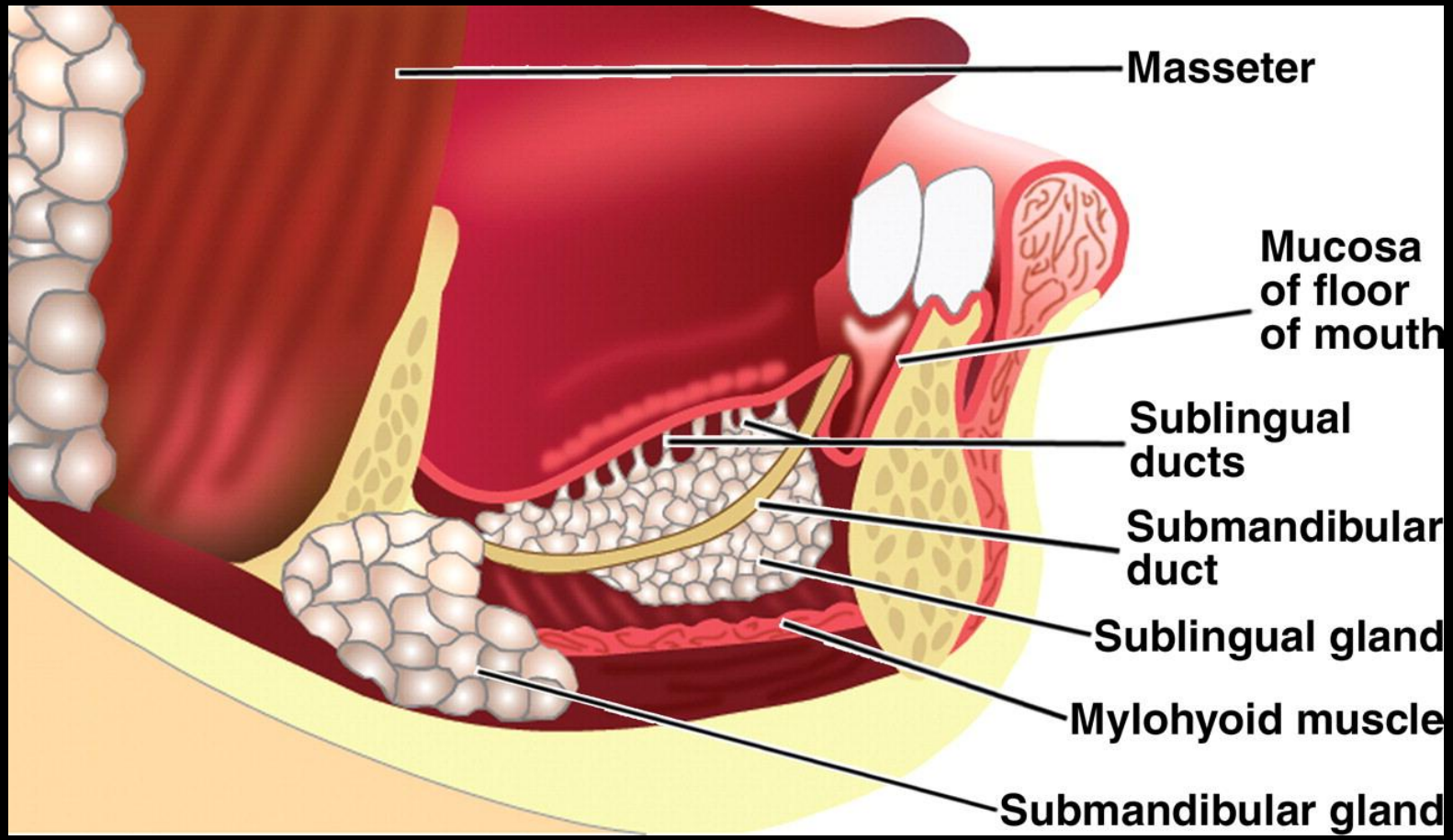
Ludwig's Angina



Definition: A infection of the submandibular space that involves both the submylohyoid and sublingual space.

- It is a characteristically aggressive, rapidly spreading cellulitis that involves the submandibular space
- No lymphatic involvement and generally no abscess formation
- Infection within the sublingual space results in swelling of the tongue that could lead to acute airway obstruction
- Infection of the submylohyoid space may spread posteriorly along the styloglossus muscle into the parapharyngeal space and continue to spread into the loose areolar tissue of the retropharyngeal space, and then further inferiorly into the superior mediastinum

Ludwig's Angina



Odontogenic disease is a common source of the infection, which can spread from the submandibular space to involve the adjacent sublingual space and result in airway narrowing by causing tongue swelling. A less common scenario is extension to the submandibular space from an infection of the palatine tonsil, as seen in this case.

Where did it get its name from?

It is named after **Wilhelm Frederick von Ludwig** (1790-1865), a German physician who first described this condition in 1836 . Somewhat ironically, he passed away from 'non-specific neck inflammation' which some believe was Ludwig angina.

Why is it called angina? In this context, the term “angina” is used in its more general sense of an intense localized pain, rather than the pain associated with cardiac ischemia.

Ludwig's Angina

Symptoms:

Swollen tongue, bull neck appearance, and difficulty in breathing

Other sx: tenderness over floor of the mouth/underneath the tongue, swelling and inflammation of the neck, uncontrolled drooling, difficulty swallowing, fever and chills, pain under the chin and over the neck

Classic signs: brawny, tender non-fluctuant induration of the submandibular space, with an elevation of the tongue.

Causes: Most commonly second or third molar, dental abscesses, dental injury or trauma, peritonsillar/parapharyngeal abscesses, mandibular fractures, oral lacerations and piercings, poor oral hygiene, dental caries

Ludwig's Angina

Diagnosis:

Made clinically, supported with imaging studies

Treatment:

-Clear the airway (sometimes perform tracheotomy)

- Appropriate antibiotics
- Drainage of excess fluids
- Administration of steroids for management of edema and cellulitis
- ENT should be on board

Resources

- Ludwig BJ, Foster BR, Saito N, Nadgir RN, Castro-Aragon I, Sakai O. Diagnostic imaging in nontraumatic pediatric head and neck emergencies. Radiographics : a review publication of the Radiological Society of North America, Inc. 30 (3): 781-99. doi:10.1148/rg.303095156 - Pubmed

- Laporte, S., Juttla, J., and Lingam, R. Imaging the Floor of the Mouth and the Sublingual Space. Radiographics 2011 31 (7): 1907-1922

- Boscolo-Rizzo P, Da Mosto MC. Submandibular space infection: a potentially lethal infection. Int J Infect Dis 2009; 13:327.

- https://www.uptodate.com/contents/submandibular-space-infections-ludwigs-angina?search=ludwig%20angina%20sprea&source=search_result&selectedTitle=1~9&usage_type=default&display_rank=1#H975545729

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