

AMSER Case of the Month

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63-year-old male presents with recurrent neck pain
and swelling

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Patient Presentation

HPI:

- Two-week history of fever, chills, sweats, poor appetite, and sore throat progressing to right oropharyngeal abscess with facial cellulitis, treated with IV antibiotics (vancomycin/ampicillin-sulbactam, then clindamycin) across multiple ED visits, c/b repeated departures AMA before completing treatment
- Now endorses constant dull right neck pain and swelling exacerbated by palpation and wide mouth opening
- Denies chest pain, dyspnea, cough, dysphagia, trauma, or prior similar episodes

PMHx/PSHx:

- T2DM (A1c 9.8%), HLD
- Colonoscopy, ankle surgery, cataract surgery, ganglion cyst removal

Meds:

- Loratadine PRN, fluticasone PRN

Patient Presentation (continued)

Vitals: T 36.8 C, BP 117/63, P 69, RR 18, SpO2 98% on RA, BMI 26

Physical Exam:

- Small, roughly 0.25 cm lesion in R oropharynx without purulence
- Diffuse, nonerythematous swelling in the R submandibular region with rubbery, nonmobile submandibular/anterior cervical lymph nodes, TTP along the jawline
- Normal respiratory effort, lungs CTAB, no wheezes or crackles

Pertinent Labs:

- WBC 18.3
- Glucose 180
- Throat Cx from prior admission: no growth
- BCx x2 from prior admission: no growth

What Imaging Should We Order?

Select the Applicable ACR Appropriateness Criteria

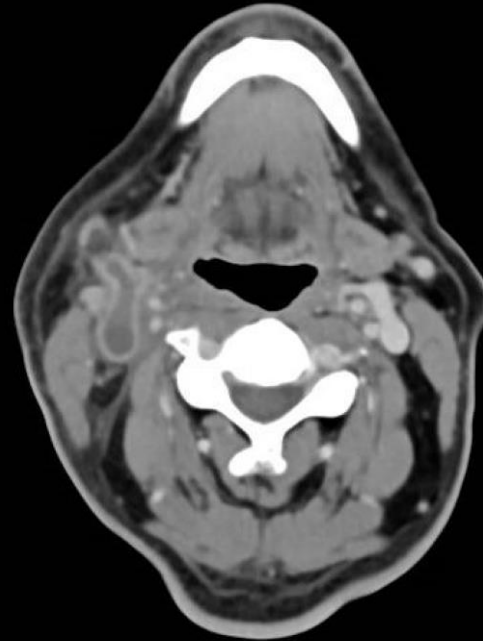
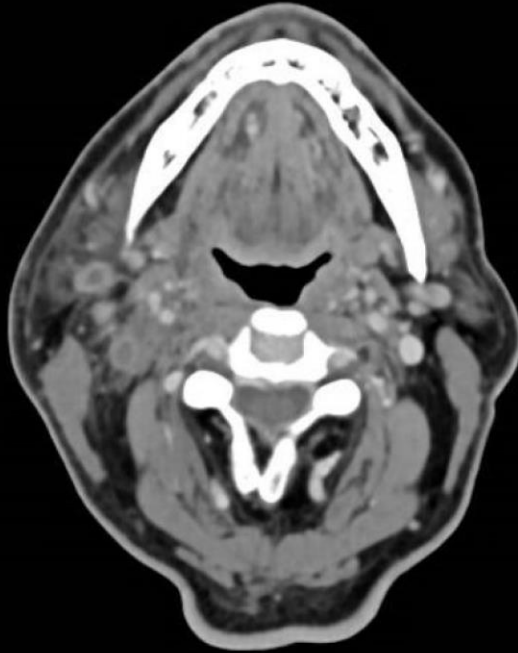
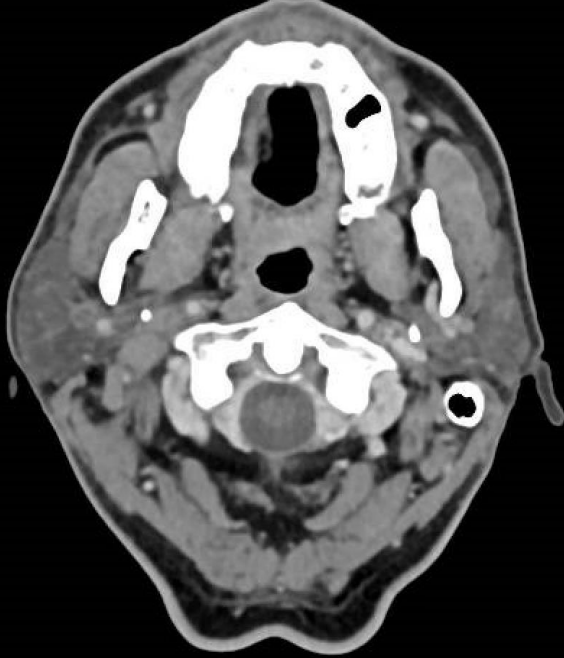
Variant: 1 Nonpulsatile neck mass(es). Not parotid region or thyroid. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
MRI neck without and with IV contrast	Usually Appropriate	0
CT neck with IV contrast	Usually Appropriate	☼☼☼
US neck	May Be Appropriate	0
MRI neck without IV contrast	May Be Appropriate	0
CT neck without IV contrast	May Be Appropriate	☼☼☼
Arteriography cervicocerebral	Usually Not Appropriate	☼☼☼
MRA neck without and with IV contrast	Usually Not Appropriate	0
MRA neck without IV contrast	Usually Not Appropriate	0
CT neck without and with IV contrast	Usually Not Appropriate	☼☼☼
CTA neck with IV contrast	Usually Not Appropriate	☼☼☼
FDG-PET/MRI skull base to mid-thigh	Usually Not Appropriate	☼☼☼
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼

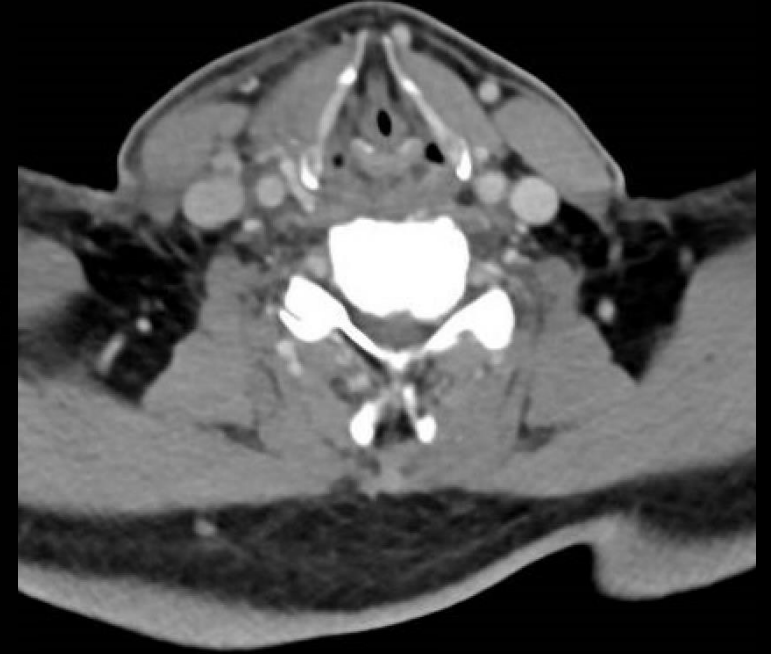
This imaging modality was ordered by the ER physician

Findings (unlabeled)

Axial, most superior



Axial, most inferior

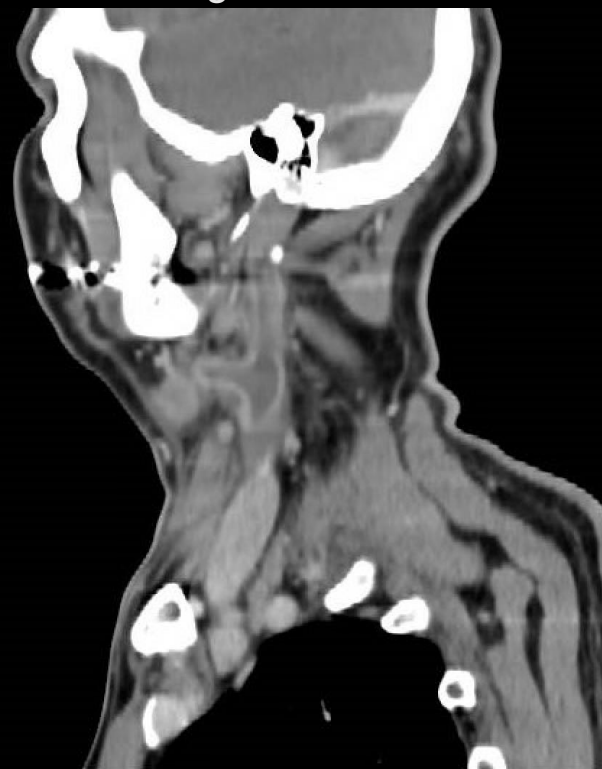


Findings (unlabeled)

Sagittal, L side

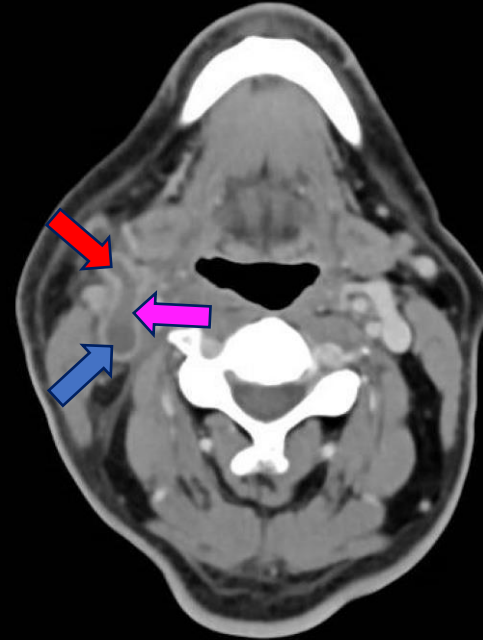
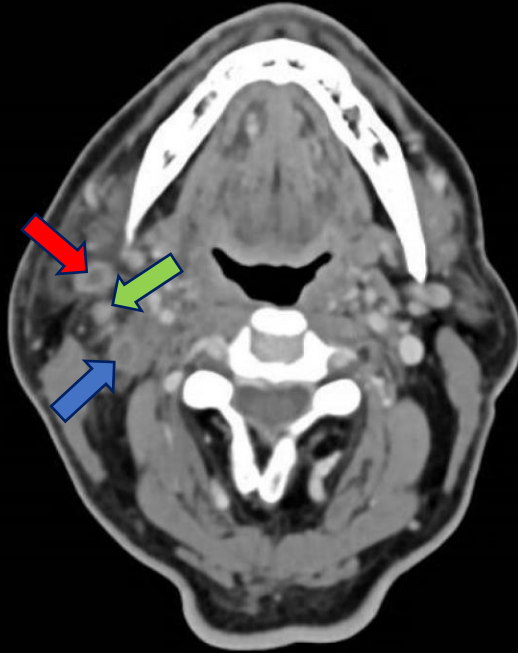
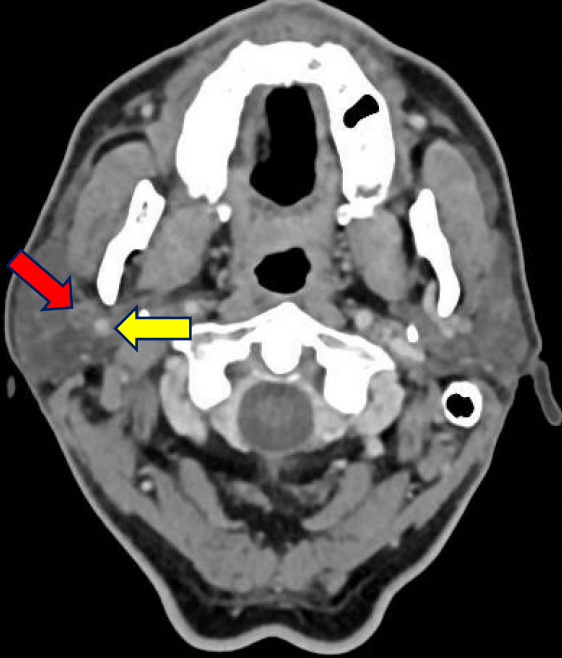


Sagittal, R side



Findings (labeled)

Axial, most superior

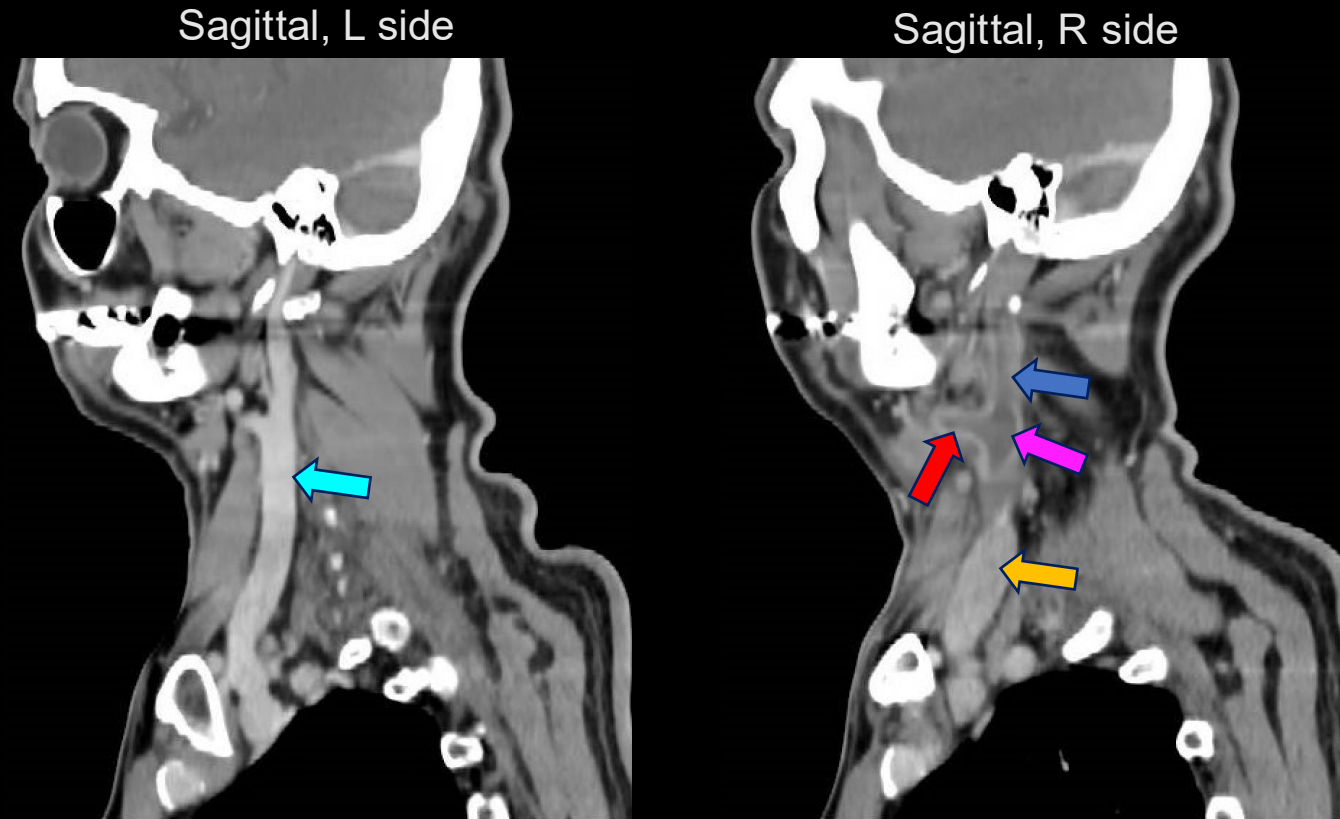


Axial, most inferior



- Filling defects involving the **R upper IJV** and **R common facial vein**, including their **confluence**
- In the lower neck, the **R lower IJV** appears patent and normally enhances
- The **retromandibular vein** appears patent and normally enhances
- 1.0x0.9 cm **R cervical 2A lymphadenopathy**

Findings (labeled)



- Filling defects involving the **R upper IJV** and **R common facial vein**, including their **confluence**
- In the lower neck, the **R lower IJV** appears patent and normally enhances
- The **L IJV** appears patent and normally enhances

What Additional Imaging Should We Order?

Select the Applicable ACR Appropriateness Criteria

Variant: 1 Suspected infective endocarditis. Initial imaging.

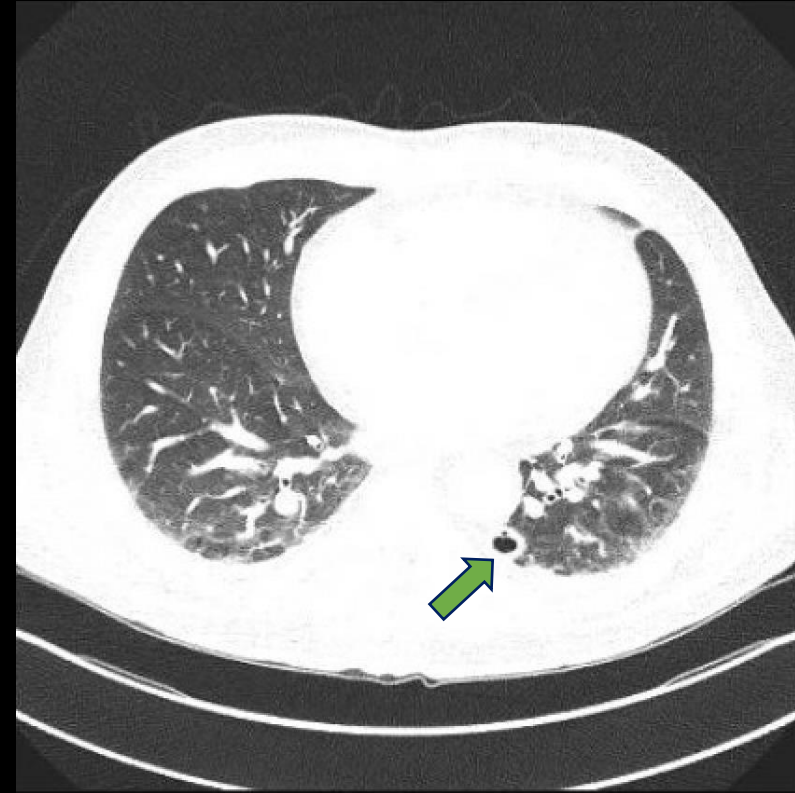
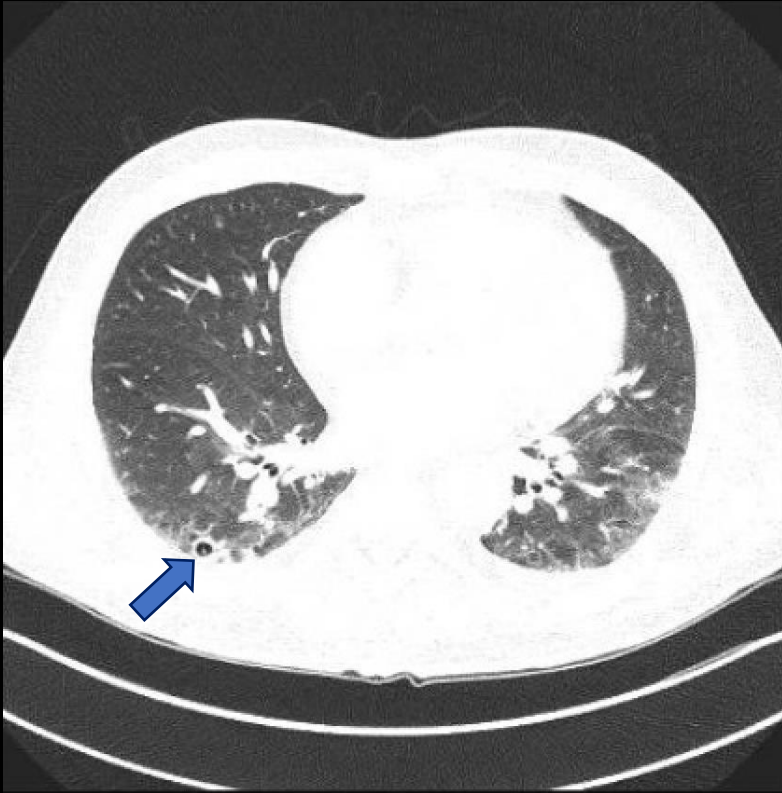
Procedure	Appropriateness Category	Relative Radiation Level
US echocardiography transthoracic resting	Usually Appropriate	○
Radiography chest	Usually Appropriate	☼
CT heart function and morphology with IV contrast	Usually Appropriate	☼☼☼
US echocardiography transesophageal	May Be Appropriate (Disagreement)	○
CTA chest with IV contrast	May Be Appropriate	☼☼☼
CTA coronary arteries with IV contrast	May Be Appropriate	☼☼☼
Fluoroscopy heart	Usually Not Appropriate	☼☼
Arteriography coronary	Usually Not Appropriate	☼☼☼
MRI heart function and morphology without and with IV contrast	Usually Not Appropriate	○
MRI heart function and morphology without IV contrast	Usually Not Appropriate	○
CT chest with IV contrast	Usually Not Appropriate	☼☼☼
CT chest without and with IV contrast	Usually Not Appropriate	☼☼☼
CT chest without IV contrast	Usually Not Appropriate	☼☼☼
FDG-PET/CT heart	Usually Not Appropriate	☼☼☼☼
WBC scan heart	Usually Not Appropriate	☼☼☼☼

This imaging modality was ordered by the otolaryngologist

Findings (unlabeled)



Findings (labeled)



- 0.9 cm peripheral cavitary lesion in the R lower lobe
- 1.3x1.3 cm cavitary lesion in the L lower lobe

Final Dx:

Lemierre syndrome c/b septic pulmonary emboli

Case Discussion: Pathophysiology & Epidemiology

Pathophysiology

- Lemierre syndrome is characterized by septic thrombophlebitis of the internal jugular vein (IJV) as a complication of oropharyngeal infection
- The classic sequence begins with pharyngitis or tonsillitis → infection spreads to lateral pharyngeal space → septic thrombophlebitis of the IJV → bacteremia with septic emboli to distant organs [1]
- Most commonly caused by *Fusobacterium necrophorum*, a Gram-negative anaerobe that is part of the normal oropharyngeal flora [1]

Epidemiology

- LS is rare (~3.6 cases per million/year overall; ~14.4 per million/year in ages 15-24); predominantly affecting previously healthy adolescents and young adults [2]
- Re-emerging in recent decades, possibly due to reduced antibiotics prescribing for pharyngitis [3]

Case Discussion: Presentation & Diagnosis

Presentation

- Classic triad: pharyngotonsillitis, IJV thrombosis, and metastatic septic emboli (most commonly to lungs; other sites include joints, liver, and CNS) [3]
- Hallmark pattern: pharyngitis that initially improves, then acutely worsens with high fevers, rigors, and unilateral neck pain/swelling [4]

Diagnosis

- Blood and throat cultures should be obtained; however, *F. necrophorum* may take several days to grow on anaerobic culture and negative cultures do not exclude the diagnosis [4]
- Contrast-enhanced CT of the neck is the diagnostic study of choice, with the hallmark finding of a filling defect within the IJV and surrounding fat stranding in the lateral pharyngeal space [5]
- Ultrasound of the neck can serve as a rapid bedside screening tool for IJV thrombosis but is less sensitive than CT [4]
- CT chest should be performed to evaluate for septic pulmonary emboli

Case Discussion: Management & Conclusions

Management

- Prolonged IV antibiotics (3-6 weeks), typically beta-lactam + metronidazole [2,4]
- Anticoagulation is controversial with no RCT evidence; may be considered for thrombus extension or persistent bacteremia [2]
- Surgical drainage for abscess complications; IJV ligation for refractory septic embolization [5]

Conclusions

- Diagnosis requires a high index of suspicion, especially in young patients with pharyngitis and persistent neck pain, sepsis, or infection at a secondary site
- Contrast-enhanced CT of the neck is the diagnostic study of choice, with the hallmark finding of a filling defect within the IJV and surrounding fat stranding in the lateral pharyngeal space
- Cavitory pulmonary nodules on chest CT in a young, previously healthy patient with recent pharyngitis should prompt consideration of Lemierre syndrome as the underlying etiology

References:

1. Riordan T. Human infection with *Fusobacterium necrophorum* (necrobacillosis), with a focus on Lemierre's syndrome. *Clin Microbiol Rev.* 2007;20(4):622-659.
2. Lee WS, Jean SS, Chen FL, Hsieh SM, Hsueh PR. Lemierre's syndrome: a forgotten and re-emerging infection. *J Microbiol Immunol Infect.* 2020;53(4):513-517.
3. Valerio L, Corsi G, Sebastian T, Barco S. Lemierre syndrome: current evidence and rationale of the BATTLE registry. *Thromb Res.* 2020;196:494-499.
4. Kuppalli K, Livorsi D, Talati NJ, Osborn M. Lemierre's syndrome due to *Fusobacterium necrophorum*. *Lancet Infect Dis.* 2012;12(10):808-815.
5. Righini CA, Karkas A, Tourniaire R, et al. Lemierre syndrome: study of 11 cases and literature review. *Head Neck.* 2014;36(7):1044-1051.