Observation of Retropharyngeal Fluid Collection in 2 COVID-19 Positive Patients

Andrew J. Steehler, BS1, Samir A. Ballestas, MD2, Danielle Scarola, MD2, Oswaldo A. Henriquez, MD, FACS2, and Charles E. Moore, MD, FAACE2

Significant statement
Our understanding of the novel coronavirus, COVID-19, is growing; yet, there remains much we do not understand, and unique presentations are abundant. One potential presentation is retropharyngeal edema, defined as fluid in the retropharyngeal space. Multiplanar imaging with computed tomography or magnetic resonance imaging is ideal for characterizing and diagnosing these fluid collections rapidly as possible life-threatening complications may develop (eg, airway obstruction and mediastinitis). Here, we discuss the presentation, imaging identification, treatment, and recovery of retropharyngeal fluid collection in 2 COVID-19 cases. The significance of this article is to suggest conservative management as a viable treatment option for retropharyngeal fluid collection, as opposed to incision and drainage, in the setting of COVID-19.

Report of Cases
Case 1
A 24-year-old obese man with no known significant past medical history (PMH) presented with left-sided neck pain, fevers, chills, nausea, vomiting, and decreased oral intake for 2 days after falling off a truck at work. At the time of injury, the patient experienced headache and neck pain; however, he denied loss of consciousness. The day following his injury, he presented to an outside hospital for persistent pain, where he was diagnosed with cervical strain as well as an infection for which he was prescribed an antibiotic. He presented to another outside hospital the next day due to continued neck pain and odynophagia resistant to Tylenol and ibuprofen and was treated with opioids for pain.

On examination, the patient was febrile, tachycardic, and tachypneic with a white blood cell (WBC) count of 13.8 and positive for COVID-19. Other significant examination features consisted of anterior neck fullness, left neck tenderness to palpation, trismus, shortness of breath, and orthopnea. On computed tomography (CT) angiogram of the head and neck, there was a large retropharyngeal effusion seen in Figure 1A and B.

The patient underwent incision and drainage (I & D) with benign findings of serosanguinous fluid in the retropharyngeal space and no signs of abscess or infection. The patient experienced a decrease in retropharyngeal edema (RPE; Figure 1C), however, following the procedure, the patient failed extubation and was transferred to the intensive care unit (ICU) with high suspicion for COVID-19 pneumonia. He experienced a protracted medical ICU course complicated by hypoxemic failure and viral myocarditis with cardiogenic shock, acute tubular necrosis, and gastrointestinal bleed.

Case 2
A 45-year-old woman with a PMH of hypertension presented to the emergency department (ED) with a 3-day history of odynophagia and bilateral tonsillar swelling. She was discharged on Augmentin, steroids, and Motrin; however, she returned to the ED 4 days later with worsened symptoms, including fevers, chills, tachycardia, WBC count of 13, and dysphagia. She was admitted for sepsis and pharyngitis complicated by retropharyngeal fluid collection found on CT soft tissue neck with contrast extending from the level of C2 to C7 (Figure 2A).

Vancomycin and zosyn were started. Her examination was significant for swelling in the posterior pharyngeal wall confirmed by flexible endoscopy. She also presented with neck...
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tenderness to palpation bilaterally, restricted range of motion of
the neck due to pain, and 1 cm lymph nodes in level IV bilaterally.

After 3 days of conservative management, the patient experi-
cenced symptom improvement with reduced RPE and WBC
count resolution. Computed tomography soft tissue neck with
contrast showed an interval improvement in RPE from 9 to 4
mm in thickness (Figure 2B). After 48 hours of afebrility, she
was discharged and switched to moxifloxacin and Bactrim
double strength for 7 days.

Figure 1. CT Angiogram Head and Neck with and without contrast on 7/21 compared to CT Soft Tissue Neck with and without contrast on
7/24. A, At presentation 7/21 axial view of edematous appearance of the bilateral palatine tonsils and suppurative left retropharyngeal lymph
node. Partial effacement of the oropharynx secondary to tonsillar edema. B, At presentation 7/21 sagittal view findings of pharyngitis/tonsillitis,
with retropharyngeal effusion extending from the level of C2 to C3 to C7-T1 with maximum thickness of 12 mm. Multiple enlarged retropharyngeal,
cervical, and supraclavicular lymph nodes, likely reactive. C, Interval 3-day follow-up 7/24 status post I & D with decreased retropharyngeal fluid
collection now measuring approximately 5 mm thickness. CT indicates computed tomography; I & D, incision and drainage.

Figure 2. CT soft tissue neck with contrast comparison at presentation and 3-day follow-up. Demonstrating retropharyngeal edematous
hypodensity extending from the level of C2 to C7. A, Initial imaging 8/18 showing retropharyngeal edema 9 mm in thickness extending from the
level of C2 to C7 without rim enhancement, most in keeping with retropharyngeal edema and no definite drainable fluid collection. B, Interval
3-day follow-up 8/21 demonstrated decrease in retropharyngeal/prevertebral hypoattenuation to approximately 4 mm in thickness. CT indicates
computed tomography.
Discussion

Retropharyngeal edema is defined as the presence of nonpurulent fluid within the retropharyngeal space. Although the disease process is not entirely understood, the fluid is thought to collect within the retropharyngeal space due to alterations in the lymphatic system. This accumulation of fluid is distinguishable on CT or magnetic resonance imaging. Etiologies include noninfectious causes, such as internal jugular vein thrombosis and radiotherapy, as well as infections originating around the retropharyngeal space. Infections in the retropharyngeal and surrounding spaces are potentially fatal, as they can spread to the carotid sheath and posterior mediastinum through what is known as the “danger space” and ultimately involve the heart and lungs.

Here, we have presented 2 cases of RPE that developed in COVID-19 positive patients and discussed presentation, treatment options, recovery, and early identification of retropharyngeal fluid collection on CT. Our understanding of the novel coronavirus has improved in recent months; however, there remains much we do not understand about the virus, and unique presentations, such as multisystem inflammatory syndrome, are abundant. We believe the 2 cases presented demonstrate COVID-19 as a potential infectious etiology for RPE. To our knowledge, retropharyngeal fluid collection has not been reported within the literature, although it has been documented that retropharyngeal infections have occurred in COVID-19 patients and arise more frequently in men.

In the cases described, because of benign findings on I & D in case 1, we were less likely to quickly move toward I & D of case 2. Although additional cases are needed to verify our claims, it may indicate that IV antibiotics and careful, watchful waiting are viable treatment options for COVID-19-associated RPE. This also decreases the likelihood of viral exposure to the staff. Further research must be performed to investigate the presentation, diagnosis, and management of retropharyngeal fluid collection in COVID-19 cases.

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ORCID iD

Andrew J. Steehler https://orcid.org/0000-0003-2948-4697

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