# Acute Laryngotracheitis as a Rare COVID-19 Complication in an Adult with Respiratory Failure

**Austin Coppinger, BA[1], Kaden Bunch, MBA[1], Surya Khatri, BA[1], Yolanda Troublefield, MD, JD[1]**

[1] Warren Alpert Medical School, Brown University, Providence, RI

THE WARREN ALPERT Medical School BROWN UNIVERSITY

## Background

Acute laryngotracheitis, most often caused by human parainfluenza viruses, rhinoviruses, and respiratory syncytial virus infections,[1] is a rare condition in adults but occurs more frequently in children. Parainfluenza accounts for the majority of pediatric croup cases and typically presents with nonspecific upper respiratory symptoms that can be difficult to distinguish from other viral infections.

Although severe laryngotracheitis associated with the COVID-19 infection is a rare pediatric diagnosis, it is even rarer in adults: to our knowledge, only six case reports and series have described adult presentations.[2,3,4,5,6] Unlike the usually self-limited course in children, adult presentations, whether from parainfluenza or COVID-19, can result in rapid respiratory deterioration requiring intensive care and advanced airway management.

Treatment has varied across reported cases and included combinations of humidified oxygen, corticosteroids, and nebulized racemic epinephrine.[2,4] However, there are no formal treatment recommendations for adult croup. Since it is unknown whether four of the six reported patients were vaccinated, there is little data to suggest vaccination reduces the risk of this rare presentation. Given the rarity of this manifestation and sparse literature, clinicians who encounter it may face vague or nonspecific symptoms that complicate timely identification.

## Case Presentation

A 55-year-old woman with a history of hoarseness, vocal cord polyps, and smoking presented with 10 days of progressively worsening symptoms, including hoarseness, sore throat, and dyspnea. She had not received a COVID-19 booster in several years. Initially managed with antibiotics and prednisone, her condition worsened with the onset of severe stridor, prompting her presentation to the emergency department. Upon arrival, the patient was unable to speak due to severe shortness of breath and exhibited significant respiratory distress. Examination revealed vocal cord swelling, and a difficult intubation was performed, requiring a 6.5 mm endotracheal tube due to edema.

A chest X-ray was nonremarkable. Computed tomography (CT) imaging revealed an infectious process involving the palatine tonsils, nasopharyngeal tissues, bilateral pleural effusions, and parenchymal opacities. The epiglottis was obscured by support tubes, and small retropharyngeal fluid collections were noted. COVID-19 testing was positive, and the patient was started on remdesivir and dexamethasone. Hypotension developed, requiring norepinephrine. She was admitted to the intensive care unit for close monitoring.

## Case Presentation (cont'd.)

The following day, she was started on ampicillin-sulbactam for broad-spectrum coverage. Her hospital course was complicated by angioedema, managed with H1 and H2 blockers. On hospital day 5, sputum culture revealed MRSA pneumonia, prompting initiation of vancomycin. After completing 5 days of remdesivir, she was successfully extubated on hospital day 8. Post-extubation examination revealed Reinke's edema and a small pressure ulcer on the right vocal cord with no vocal cord paralysis. The patient reported worsening of her baseline voice disturbance, speaking only in whispers. She was discharged on hospital day 11 with oral doxycycline to complete a 10-day course for MRSA pneumonia and achieved smoking cessation.

Despite voice rest, persistent dysphonia necessitated suspension microlaryngoscopy with cytoreduction for Reinke's edema six weeks post-discharge. At two-week surgical follow-up, she demonstrated excellent healing with significant voice improvement and expressed high satisfaction with her recovery.

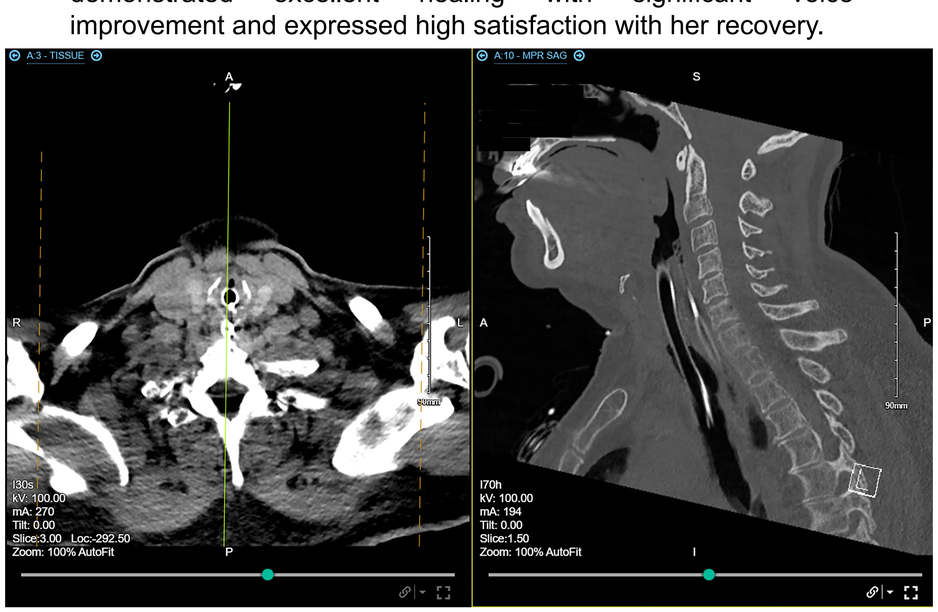


**Figure 1: CT Imaging of Laryngotracheitis**
(A) Axial and (B) Sagittal views demonstrating significant posterior hypopharyngeal and tracheal wall narrowing. ETT in place.

| Author, Year | Age/Sex | Vaccinated | Stridor | Intubated | Outcome |
|---|---|---|---|---|---|
| Current case, 2025 | 55/F | No (no recent booster) | Yes | Yes (difficult, 6.5mm ETT) | Recovered, voice improved after SML |
| Tanaka et al., 2022 | 29/F | Yes (2 doses) | Yes | No | Discharged day 10, complete resolution |
| Zuccarelli et al., 2022 | 52/F | Unknown | Not specified | No | Discharged after 24 hours, 5-day oral dexamethasone |
| Alhedaithy et al., 2022 | 52/F | Unknown | Yes | Yes (initially, then re-intubated) | Tracheostomy required, eventual recovery |
| H.M. et al., 2024 | 18/F | Unknown | Yes | Yes (6.0mm ETT) | Extubated day 8, discharged day 11 |
| Oliver et al., 2020 - Case 1 | 69/F | Unknown | Not specified | Yes (8.0mm, downsized to 6.0mm) | Extubated day 23, stepped down day 25 |
| Oliver et al., 2020 - Case 2 | 45/F | Unknown | Yes | Yes (7.0mm, re-intubated) | Tracheostomy day 15, weaning well day 22 |

**Table 1: Literature Review of Adult COVID-19 Laryngotracheitis**

## Discussion

COVID-19 laryngotracheitis represents a severe complication that can cause significant upper airway compromise. Our patient presented with progressive stridor and respiratory distress requiring emergent intubation with a smaller endotracheal tube (6.5 mm) due to laryngeal edema. Laryngotracheobronchitis, commonly referred to as croup, is almost exclusively seen in the pediatric population but is more severe in adults, often requiring aggressive treatment and longer hospital stays.1 Adult croup commonly presents with the "steeple sign" on chest radiography, representing subglottic narrowing.[7] While parainfluenza virus type-1 is the most common pathogen in children, SARS-CoV-2 has emerged as a rare causative agent of laryngotracheitis in both pediatric and adult populations.[5,8]

Treatment of COVID-19 laryngotracheitis required a multifaceted approach. Our patient received remdesivir and dexamethasone per standard COVID-19 protocols.[9] Mainstay therapy for croup includes humidified oxygen, corticosteroids, and nebulized adrenaline, though formal treatment recommendations in adults are lacking.[7] The hospital course was complicated by secondary MRSA pneumonia requiring vancomycin, highlighting the risk of bacterial superinfection in critically ill COVID-19 patients. Post-extubation findings of Reinke's edema and vocal cord ulceration may represent sequelae of both viral infection and prolonged intubation, though her 35-pack-year smoking history likely contributed to the Reinke's edema. The need for subsequent surgical intervention with suspension microlaryngoscopy and cytoreduction underscores the potential for persistent laryngeal complications even after resolution of acute infection.

This case emphasizes the importance of recognizing COVID-19 laryngotracheitis as a potential cause of upper airway obstruction, particularly in unvaccinated or under-vaccinated individuals. Clinicians should maintain high suspicion for laryngeal involvement in COVID-19 patients presenting with stridor or voice changes and be prepared for difficult airway management requiring smaller endotracheal tubes. Early multidisciplinary involvement of critical care and otolaryngology specialists is essential for optimal outcomes.

## Acknowledgements

We thank the for the American Academy of Otolaryngology–Head and Neck Surgery Foundation (AAO-HNSF) for the opportunity to present our research. For any further questions, please feel free to contact Austin Coppinger (austin_coppinger@brown.edu).

References:
1. Rihkanen H, Rönkkö E, Nieminen T, Komsi KL, Räty R, Saxen H, Ziegler T, Roivainen M, Söderlund-Venermo M, Anne L, Hovi T. Respiratory viruses in laryngeal croup of young children. The Journal of pediatrics. 2008 May 1;152(5):661-5.
2. Alhedaithy AA, Murad IS, Aldabal N. Acute laryngotracheitis caused by COVID-19: A case report and literature review. International journal of surgery case reports. 2022 May 1;94:107074.
3. Arjun HM, Shinde V, Bhattaram S. Adult Laryngotracheobronchitis in the Setting of a COVID-19 Infection. Cureus. 2024 Aug 30;16(8).
4. Tanaka Y, Hirano K, Sekino E, Shimane T, Kobayashi H. Case Report: A 29-Year-Old Pregnant Woman at 24 Weeks of Gestation Presenting with Laryngotracheitis and COVID-19 Due to the R. 1 Variant of SARS-CoV-2. The American Journal of Case Reports. 2022 Oct 18;23:e937834-1.
5. Zuccarelli AM, Leonard CG, Hampton SM. LARYNGOTRACHEOBRONCHITIS, CROUP, AN UNUSUAL PRESENTATION OF SARS-COV-2. Ulster Med J. 2022 Jan;91(1):57-58. Epub 2022 Feb 11. PMID: 35169346; PMCID: PMC8835411.
6. Oliver CM, Campbell M, Dulan O, Hamilton N, Birchall M. Appearance and management of COVID-19 laryngo-tracheitis: two case reports. F1000Research. 2020 Aug 20;9:310.
7. Patel JJ, Kitchin E, Pfeifer K. A narrowing diagnosis: a rare cause of adult croup and literature review. Case Rep Crit Care. 2017;2017:9870762.
8. Venn AMR, Schmidt JM, Mullan PC. Pediatric croup with COVID-19. Am J Emerg Med. 2021;43:287.e1-e3.
9. National Institutes of Health. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. Accessed December 21, 2021. https://www.covid19treatmentguidelines.nih.gov