

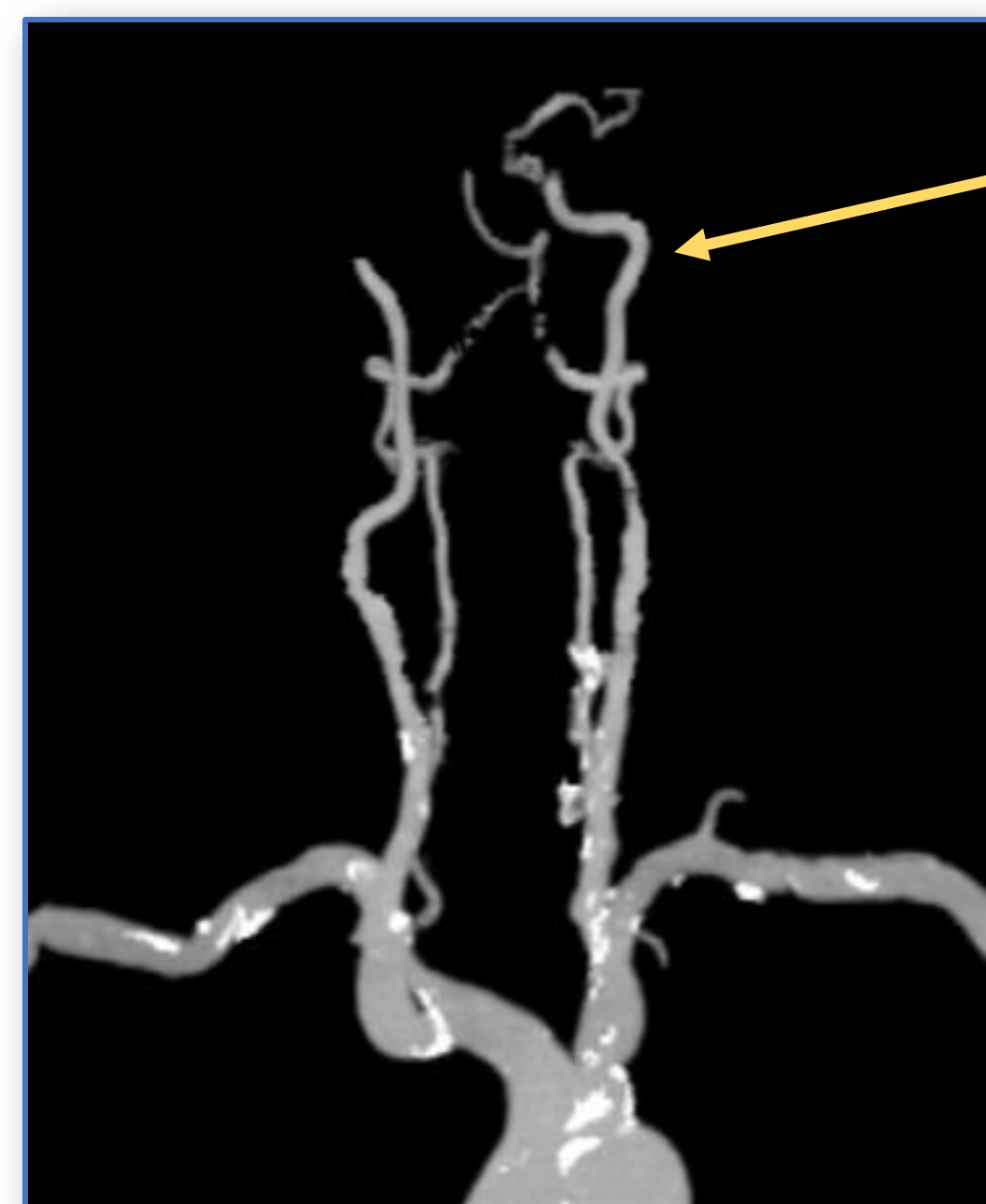
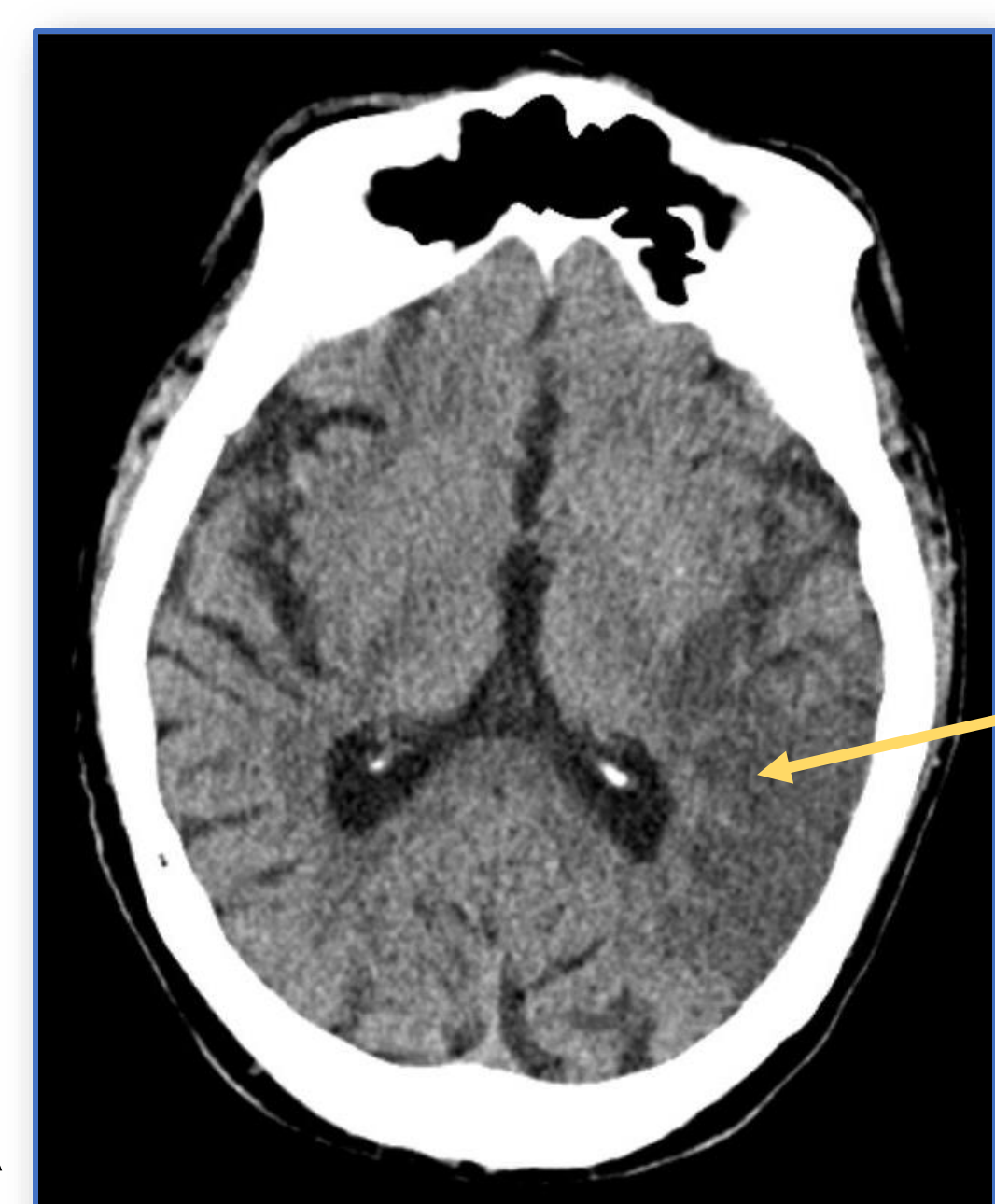
Background

Prevalent conditions as diabetes, hyperlipidemia, atrial fibrillation, and smoking account for the brunt of acute ischemic stroke risk. Providers are trained to manage these risk factors but there may be rare and unforeseen contributors to stroke risk. Viral infections may trigger both systemic inflammation and cerebral vasculopathy¹. The latter may compromise cerebral perfusion precipitating an acute stroke². We present a case of community-acquired Adenovirus-associated stroke in an adult.

Clinical Presentation

A 70-year-old male presented with a chief complaint of acute onset progressive shortness-of-breath, lower extremity swelling, and an acute dry cough. Significant past medical history of congestive heart failure, coronary artery disease status post bypass graft in 2012, atrial fibrillation on warfarin, diabetes mellitus type II, and a former smoker. The patient was hypoxic on arrival with oxygen saturation of 83%, requiring supplemental oxygen. Chest x-ray was significant for pulmonary edema with concern of multifocal pneumonia. The patient was placed on BiPAP and adequate diuresis but ultimately required intubation due to acute respiratory failure.

Several days later, blood cultures were negative for bacterial growth but the upper respiratory PCR panel was positive for Adenovirus. After initial extubation, the patient was found to have right sided weakness and significant expressive aphasia. CT head resulted left middle cerebral artery territory infarct with an ASPECT score of 5. He was not a candidate for tissue plasminogen activator. Serial CT head imaging for possible hemorrhagic conversion was negative. Although the patient began to regain his strength, he became reliant on ventilator support requiring tracheostomy placement. The patient was transferred to a long-term acute care facility for further treatment and recovery.



Hospital Course

Day 1 – Admitted to KHDO for shortness of breath and hypoxia

Day 3 – Intubated and bedside bronchoscopy performed
→ Upper respiratory panel: + Adenovirus

Day 4 – Off sedation and extubated
→ NIHSS 7pts
→ CT head L MCA infarct ASPECT score 5
• M2, M3, M6 segments
• Sub insular region
• Internal capsule vs lentiform nucleus
→ CT angiogram
• No evidence of occlusion in the L MCA
• Mild stenosis of the posterior division beyond the genu

Condition	Value	Risk
Hgb A1c	6.3%	> 7.0%
LDL	71	> 70
INR	6.5	< 2.0
Smoking History	Quit 40 years ago	Current Smoker
Viral Infection	+ Adenovirus

Table 1. Prevalent conditions high risk for acute ischemic stroke. Patient's significant labs and risk for stroke.

Image A. Initial CT head demonstrating the left middle cerebral artery territory ischemia.

Image B. CT angiogram demonstrating a patent LCA and L MCA post stroke illustrating the event was not due to a thrombotic cause but possibly a systemic inflammatory etiology of acute ischemic stroke post respiratory viral infection.

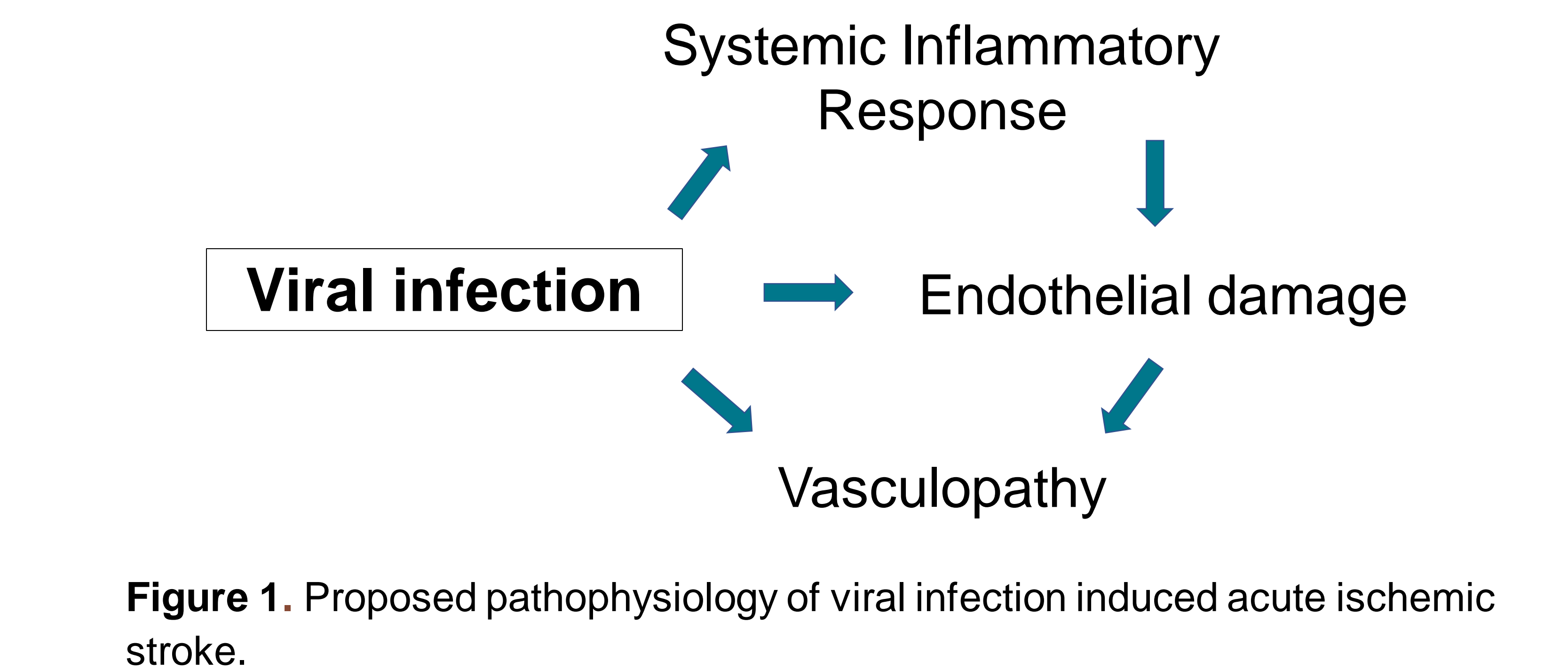


Figure 1. Proposed pathophysiology of viral infection induced acute ischemic stroke.

Discussion

- Although the patient's PMHx includes the most prevalent conditions with increased stroke risk, he was medically managed with a Hgb A1c 6.3%, lipid panel LDL 71, and supratherapeutic INR 6.5 (CHA₂DS₂-VASc score 7.2%).
- After the patient was diagnosed with Adenovirus, he presented with an ischemic stroke 24 hours later (NIHSS 7pts).
- Neurological viral infections are known to cause an ischemic stroke whereas very few cases of respiratory viral infections are associated with an ischemic stroke³.
- This patient's case brings to the forefront the association of viral respiratory infections and acute ischemic strokes in the elderly.
- Consider recent viral infections as an independent risk factor for ischemic stroke and the importance of prevention and treatment with vaccinations, anti-viral, and/or anti-inflammatories.

References

1. Channon, K. M., Qian, H. S., Youngblood, S. A., Olmez, E., Shetty, G. A., Neplioueva, V., Blazing, M. A., & George, S. E. (1998). Acute host-mediated endothelial injury after adenoviral gene transfer in normal rabbit arteries. *Circulation Research*, 82(12), 1253–1262. <https://doi.org/10.1161/01.res.82.12.1253>
2. Bahouth, M. N., & Venkatesan, A. (2021). Acute viral illnesses and ischemic stroke. *Stroke*, 52(5), 1885–1894. <https://doi.org/10.1161/strokeaha.120.030630>
3. Kutleša, M., Tešović, G., Knezović, I., Miše, B., Višković, K., & Barišić, N. (2009). Ischemic stroke associated with adenoviral infection in a 4-year-old boy. *Wiener Klinische Wochenschrift*, 121(23-24), 776–779. <https://doi.org/10.1007/s00508-009-1286-4>.