

# Elevated Spike Protein Antibodies in Patients With Post-COVID-19 Neurologic Symptoms

Neha Chandra B.S.<sup>1</sup>, Prisha Ramnath<sup>1</sup>, Judith Lin B.S.<sup>1</sup>, Lina Bedjaoui M.S.<sup>1</sup>, Sudhir Kathuria M.D.<sup>2</sup>, Harpal Mangat M.D.<sup>1</sup>

<sup>1</sup> Mangat and Kaur Inc., Germantown, MD <sup>2</sup> Charter Radiology



## Abstract

### INTRODUCTION:

- Persistent neurologic symptoms, like headache, dizziness, brain fog\*, can occur after COVID-19 infection or vaccination.
- Studies have shown that neurological COVID-19 has been associated with mastoid facial nerve enhancement and mastoid effusion<sup>1</sup>, but links to spike protein antibodies and treatment remain unclear.

### CASE PRESENTATION:

- Two patients (42F, 24M) with prolonged post-COVID neurologic symptoms were followed longitudinally, both with markedly elevated spike protein antibodies (>12,000 U/mL vs <0.8 normal).
- Periods of high antibody levels correlated with worsening symptoms and MRI findings of mild perineural thickening in the bilateral mastoid segments of the facial nerves.
- With ivermectin treatment, antibody levels declined over one year, accompanied by resolution of neurological symptoms.

## Objectives

- Investigate the relationship between spike protein antibody levels and persistent neurologic symptoms following COVID-19.
- Examine MRI findings of the mastoid segment of the facial nerve in patients with elevated spike protein antibodies.
- Evaluate whether changes in spike protein levels during treatment correspond with symptom improvement.

## Study Aim

To analyze how fluctuations in spike protein antibody levels correlate with the severity and progression of persistent neurological symptoms following COVID-19, accompanied by imaging findings that correlate with the severity and progression of persistent neurological symptoms.

## Methods

- Two patients with prolonged post-COVID neurologic symptoms were followed longitudinally with serial spike protein antibody measurements over approximately one year, regular documentation of neurologic symptoms at each visit, and brain MRI with contrast performed to evaluate structural and inflammatory changes in the mastoid segment of the facial nerve.
- The 42-year-old female, with two prior COVID-19 infections, underwent brain MRI at the time of peak levels to assess the mastoid segment; she had a total of five antibody measurements collected between 8/29/2024 and 6/16/2025. The 24-year-old male, with a prior COVID-19 infection, underwent brain MRI at peak levels to evaluate the mastoid segment; he had a total of four antibody measurements collected between 12/2024 and 12/2025. Both had neurologic symptoms monitored every couple of months during the follow-up period.

## Results

- Both patients demonstrated persistently elevated spike protein antibody levels (>12,000 ug/mL).
- **MRI revealed mild perineural thickening of the bilateral mastoid segments of the facial nerves with mastoid effusions** at elevated levels around 12,000 ug/mL.
- Periods of **higher spike protein levels corresponded with worsening neurologic symptoms:** headaches, dizziness, brain fog\*.
- During longitudinal follow-up, declining spike protein antibody levels were observed alongside clinical improvement in both patients.

## Figure 1: Antibody Spike Protein Trend

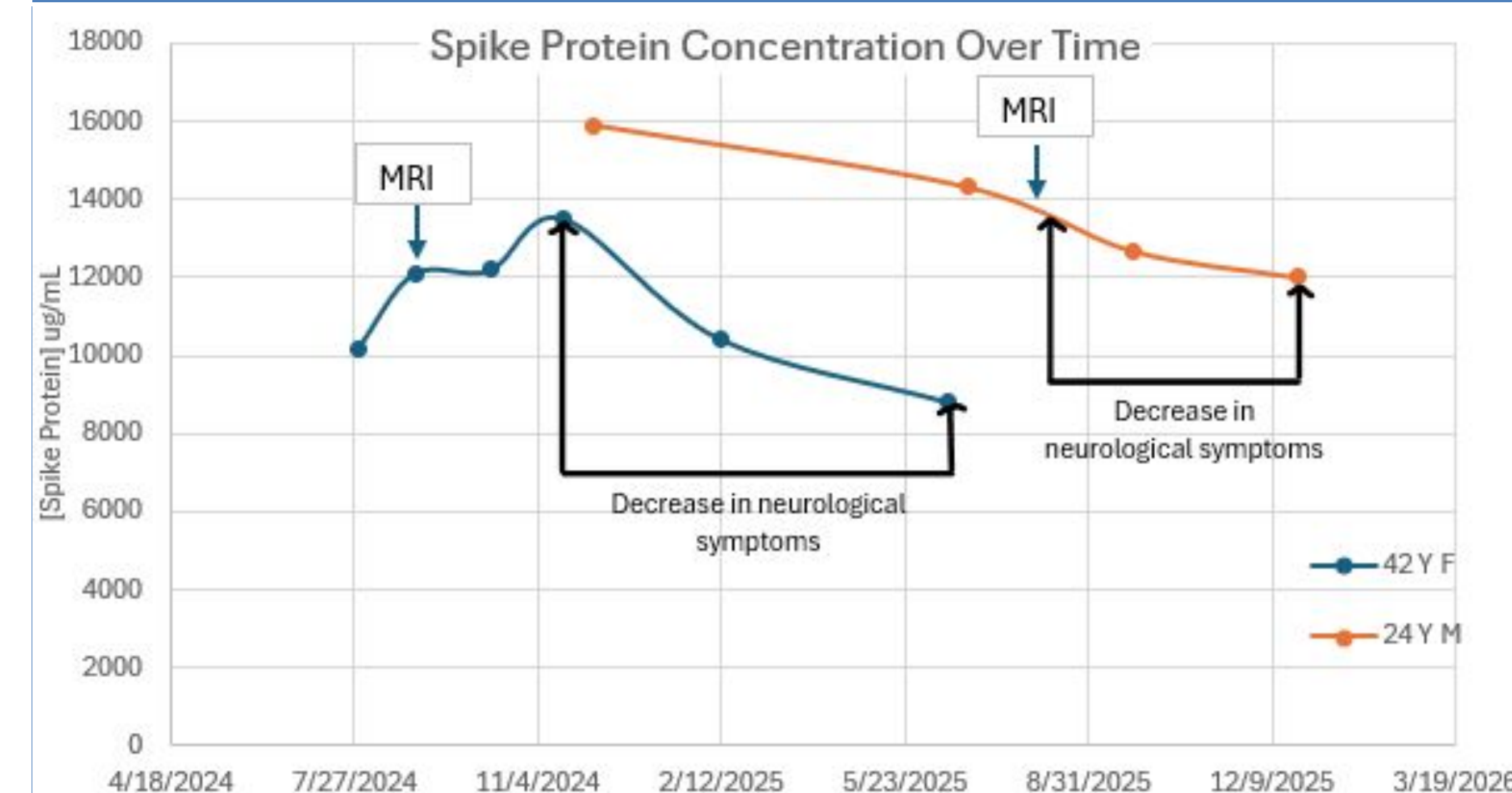


Figure 1. Line plot shows spike protein concentration of both individuals over time. MRIs for both patients are taken at <12,000 ug/ml, determining facial nerve thickening and mastoid effusion, and both patients decrease in neurological symptoms as their spike protein levels decrease.

## Discussion

- Elevated spike protein antibody levels were associated with persistent neurologic symptoms and imaging findings suggesting neuroinflammation; declines in antibodies paralleled clinical improvement.
- MRI during high antibody periods showed mastoid effusions and facial nerve thickening, potentially explaining headaches, dizziness, and cognitive symptoms.
- Ivermectin use coincided with reduced antibody levels and symptom resolution, suggesting a possible link between spike protein, neuroinflammation, and symptom severity.

## Conclusion

Both patients showed elevated spike protein antibody levels associated with mastoid facial nerve thickening and effusions, with subsequent declines in antibody levels correlating with clinical improvement over time.

## References

1. Frazier, Kaitlyn M., et al. "SARS-CoV-2 Virus Isolated from the Mastoid and Middle Ear: Implications for COVID-19 Precautions during Ear Surgery." *JAMA Otolaryngology-Head & Neck Surgery*, vol. 146, no. 10, 1 Oct. 2020, pp. 964-966

## Footnotes

\*As stated by both 42Y F and 24 Y M. 42Y F stated she struggled to perform high level tasks at her job, increased irritability, poor concentration, and forgot names of children. 24 Y M reported episodic dizziness and confusion

## Figure 2: MRI

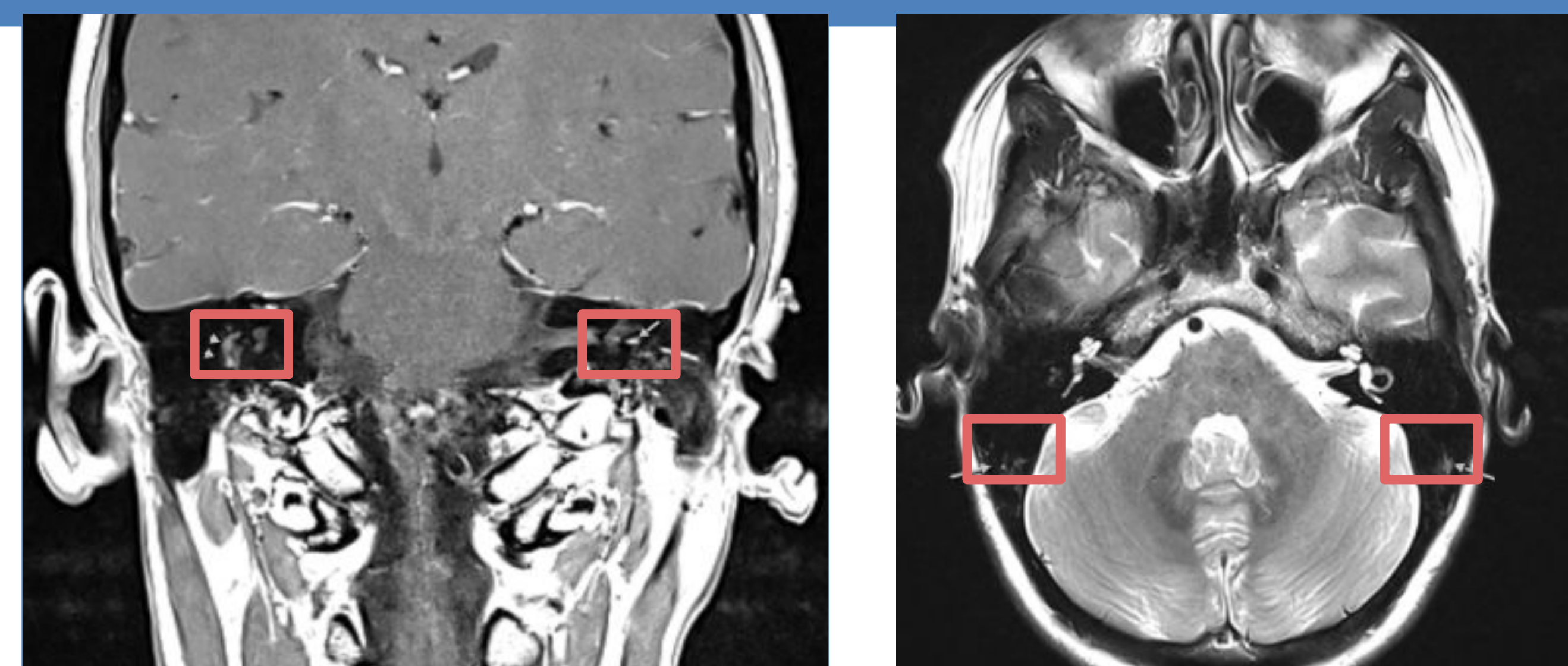


Figure 2. MRIs at T2 weighted contrast of the 42Y F taken in July 2024, prior to antibody measurements. The leftmost image shows the enhancement of the mastoid segment of the facial nerve, pointed by the white arrowhead and boxed in red, on both sides of the head. The rightmost image shows fluid in the mastoid region, indicating mastoid effusion, also pointed by the white arrowhead and boxed in red on either side.