

## Letter: COVID Conundrum: Postoperative COVID-19 Infections Following Endonasal Transsphenoidal Pituitary Surgery

To the Editor:

Early in the COVID-19 global pandemic, the neurosurgical and otolaryngology communities recognized that endonasal, transsphenoidal surgeries were particularly high risk for intraoperative exposure to aerosolized viral particles from the traumatized nasal mucosa.<sup>1</sup> As a result, recommendations were put into place to protect the health care teams, with testing for COVID-19 infection strongly recommended 48 h prior to transsphenoidal surgery and team members recommended to wear full PPE even in COVID-19 negative cases as an added precaution against false negative tests.<sup>2</sup> However, less is known about if and how transsphenoidal surgery affects the patients' susceptibility to contracting COVID-19. In this report, we describe 3 patients with negative preoperative COVID-19 tests, who developed a postoperative COVID-19 infection shortly after their transsphenoidal surgery, and discuss the potential implications of these observations. Given the lack of protected health and/or identifying information in the clinical vignettes, patient consent was not sought prior to this correspondence.

The first patient presented with blurry vision and new cranial nerve (CN) VI palsy and underwent an uneventful transsphenoidal resection of a large nonfunctioning macroadenoma. The patient was discharged home on postoperative day (POD) 1 but presented to the emergency room 3 wk later with a fever, nausea/vomiting, and headache. The patient was found to be hypotensive, concerning for adrenal insufficiency, and also tested COVID-19 positive. The patient responded to hydrocortisone for his adrenal insufficiency and underwent symptomatic management of his viral illness.

The second patient had a history of metastatic malignancy and presented with a large sellar mass with suprasellar extension causing displacement of the optic chiasm. After a negative preoperative COVID-19 test, the patient underwent an uneventful transsphenoidal resection and a 1-d hospitalization. After 9 d, the patient reported malaise and headaches and presented to a local ER where RNA testing revealed the patient now had COVID infection and was additionally hyponatremic with sodium of 126.

The last patient had a negative COVID-19 PCR test 3 d before transsphenoidal resection of a cystic pituitary macroadenoma with suprasellar extension. The patient was discharged the next day but returned to the emergency room on POD2 with fevers, tachycardia, and shortness of breath. Serum electrolytes were normal, but a chest x-ray showed a hilar consolidation and the patient tested COVID-19 positive.

These cases highlight the importance of maintaining greater vigilance for COVID-19 precautions and for heightened exposure risk when treating patients with pituitary pathology. Our

standard institutional protocol requires patients to test COVID-19 negative within 4 d prior to proceeding with surgery, and to our knowledge, these are the only neurosurgical patients at our institution since the beginning of the pandemic that developed a de novo COVID-19 infection early in the postoperative setting. Moreover, all 3 patients required hospitalization for treatment of their viral infection, and 2 had sequela of exacerbated pituitary dysfunction (adrenal insufficiency, hyponatremia). Although 2 patients presented with headaches, none of the patients developed any meningeal symptoms or neurological sequela suggestive of central nervous system viral infection. While it is possible these patients were carrying a latent infection and the stress of surgery negatively affected the immune response, it is also possible (and even likely in the case of Patient 1) that the infection was acquired following the surgery, either during inpatient hospitalization or out within the community after discharge. Given the pituitary dysfunction after transsphenoidal surgery and potentially compromised stress response, the ramifications of a COVID-19 infection may thus be more serious in the post-transsphenoidal setting, and both patients and providers should be advised to pay heed to this additional risk. Although other small case reports have not found an increased risk following endonasal transsphenoidal surgery,<sup>3</sup> we suggest patients be strongly advised to restrict their activities to minimize their exposure risk after discharge. Hospital policies should consider these patients high risk for COVID-19 infection even in the setting of the negative preoperative COVID-19 test. Moreover, asymptomatic testing in the postoperative period may be warranted to monitor for infections and arrange for more frequent hormonal and electrolyte testing in patients who develop COVID-19 infections.

Thankfully, to date, no members of the surgical team have reported viral symptoms or tested positive following these cases, but providers were required to self-quarantine to avoid the possibility of asymptomatic transmission to other patients and staff. As other case reports have previously described,<sup>2</sup> providers in the operating room during aerosol-generating procedures should take the highest precautions possible, even more so than the average neurosurgical procedure. Based on our experience we would strongly recommend any intraoperative and postoperative contact with patients undergoing transsphenoidal surgery is undertaken wearing respiratory isolation level PPE.


While these 3 cases highlight the potential risks associated with transsphenoidal surgery during a respiratory virus pandemic, it remains the case that some patients with progressive neurological symptoms cannot tolerate surgical delays. Safety remains the number one priority, and taking extra precautions when managing these patients in the hospital and providing patients with additional education regarding the risks of postoperative COVID-19 infection may help reduce the postoperative COVID-19 risk.

## Funding

This study did not receive any funding or financial support.

## Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

**Jacob S. Young, MD** \*

**Taemin Oh, MD**\*

**Tarun Arora, MD**\*

**Lewis S. Blevins, MD**\*

**Manish K. Aghi, MD, PhD**\*

**Ivan H. El-Sayed, MD**‡

**Sandeep Kunwar, MD**\*

**Philip V. Theodosopoulos, MD**\*

\*Department of Neurological Surgery  
University of California, San Francisco  
San Francisco, California, USA

‡Department of Otolaryngology-Head & Neck Surgery  
University of California, San Francisco  
San Francisco, California, USA

## REFERENCES

1. Zhu W, Huang X, Zhao H, Jiang X. A COVID-19 patient who underwent endonasal endoscopic pituitary adenoma resection: a case report. *Neurosurgery*. 2020;87(2):E140-E146.
2. Patel ZM, Fernandez-Miranda J, Hwang PH, et al. Letter: precautions for endoscopic transnasal skull base surgery during the COVID-19 pandemic. *Neurosurgery*. 2020;87(1):E66-E67.
3. Arnaout MM, Bessar AA, Elnashar I, Abaza H, Makia M. Pituitary adenoma surgeries in COVID-19 era: early local experience from Egypt [published online ahead of print: October 29, 2020]. *Surg Neurol Int*. doi:10.25259/SNI\_472\_2020.

© Congress of Neurological Surgeons 2021. All rights reserved. For permissions, please e-mail: [journals.permissions@oup.com](mailto:journals.permissions@oup.com)

---

10.1093/neuros/nyab054

---