# Letters to the Editor

## Case Report: Thrombotic Thrombocytopenia after COVID-19 Janssen Vaccination

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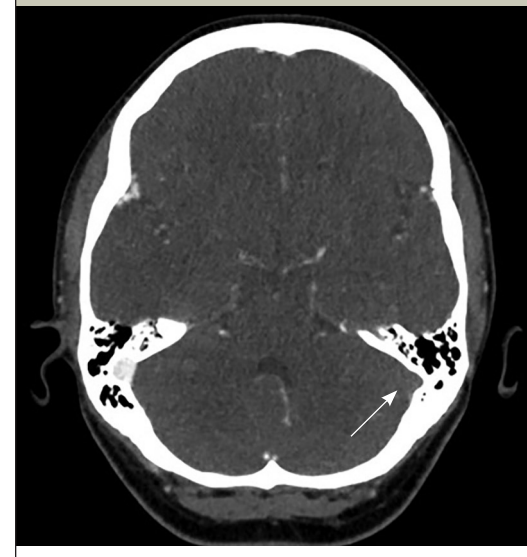
**To the Editor:** Nearly 7 million doses of Johnson & Johnson's Janssen (Ad26.COV2.S) viral vector vaccine have been administered in the United States to combat the COVID-19 pandemic. Several cases of vaccine-induced thrombotic thrombocytopenia from a similar viral vector vaccine (Oxford–AstraZeneca [ChAdOx1 nCoV-19]) have been reported.[1,2] More recently, six cases of cerebral venous sinus thrombi in young women were reported after receiving the Janssen Ad26.COV2.S vaccine, which led the Centers for Disease Control and Prevention and the U.S. Food and Drug Administration to recommend temporarily pausing its use.[3] We present a case of a patient with a cerebral venous sinus thrombosis, pulmonary embolism, and thrombocytopenia after receiving the Janssen Ad26.COV2.S vaccine.

A 40-year-old woman with a history of migraines, obesity, and no other known thrombotic risk factors developed a sudden headache, body aches, fever, and chills six days after receiving the Janssen vaccine. The patient presented to an urgent care facility on day 8 because of worsening pain with sinus pressure and was prescribed amoxicillin/clavulanate (Augmentin), methocarbamol (Robaxin), and methylprednisolone for presumed acute sinusitis. On day 9, her headache improved, but she developed swollen red cheeks and bilateral lower-extremity pain without edema. On day 10, her lower-extremity pain resolved, but her headache worsened, and she experienced intermittent vertigo. As the redness and swelling resolved, she noticed petechiae on her right cheek and bilateral breasts and spontaneous bruising in her extremities. On day 12, she presented to the emergency department for an intolerable headache. Laboratory and imaging studies demonstrated thrombocytopenia (platelets of 20,000), a D-dimer of 45,570 ng per mL (normal is less than 500 ng per mL), pulmonary emboli, and dural venous sinus thrombosis *(Figure 1)*. An initial in-house heparin-induced thrombocytopenia antibody enzyme-linked immunosorbent assay (ELISA) test result was negative; however, a confirmatory heparin-induced thrombocytopenia test found a positive platelet factor-4 ELISA, serotonin release assay, and platelet P-selectin expression assay. Although this patient had no previous exposure to heparin, the clinical presentation and laboratory results were similar to heparin-induced thrombotic thrombocytopenia. This patient's presentation is consistent with the reported cases of suspected vaccine-induced thrombotic thrombocytopenia recently described in the literature.[1,2,4]

The patient was treated with a nonheparin anticoagulant, bivalirudin (Angiomax). She was started on prednisone, 1 mg per kg per day, and two days of intravenous immunoglobulin at 1 g per kg per day for thrombocytopenia. After

FIGURE 1



**Computed tomography head/brain venogram demonstrating occlusive dural venous sinus thrombosis *(arrow)*.**

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the cerebral venous sinus thrombosis decreased in volume on subsequent imaging, she was discharged home on hospital day 7 on rivaroxaban (Xarelto) and a prednisone taper. At a follow-up visit, the platelet count had normalized and her symptoms had improved. Although these complications are currently extremely rare relative to the number of vaccines administered, understanding the responsible mechanism will be essential to determine individuals who are at higher risk of adverse effects from the viral vector COVID-19 vaccines.

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**Editor's Note:** On April 23, 2021, the U.S. Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention lifted their temporary pause on the use of the Ad26.COV2.S viral vector vaccine in the United States, concluding that "this vaccine is safe and effective in preventing COVID-19" and that "the vaccine's known and potential benefits outweigh its known and potential risks in individuals 18 years of age and older."[1] After a thorough safety review, the agencies identified 15 cases of vaccine-induced thrombotic thrombocytopenia (including the original six cases that prompted the pause) among nearly 7 million doses administered before April 13, all in women between 18 and 59 years of age, with symptom onset six to 15 days post-vaccination.[1] In addition, the phase 3 trial data on the vaccine submitted by Janssen to the FDA for emergency use authorization were recently published, demonstrating a 67% to 77% efficacy against mild to severe COVID-19 at least 14 days after administration.[2] The editors of *AFP* agree that the individual and public health benefits of continuing to administer the Janssen vaccine to our patients greatly outweigh the rare adverse effect documented in this case report.—Kenny Lin, MD, MPH, Deputy Editor

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## Using DaTscan to Diagnose Parkinson Disease

**Original Article:** Parkinson Disease

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**Available at:** https://www.aafp.org/afp/2020/1201/p679.html

**To the Editor:** The article by Dr. Halli-Tierney and colleagues summarized the diagnosis and treatment of Parkinson disease well. Although the diagnosis is mostly clinical, in more uncertain cases, the addition of a DaTscan (dopamine transport single-photon emission computed tomography scan) can be helpful.[1] By confirming normal dopamine activity, the DaTscan can differentiate drug-induced Parkinson-like syndromes from actual Parkinson disease. For atypical presentations that mimic stroke or depression, the finding of diminished dopamine transport can redirect the differential diagnosis and treatment back to Parkinson disease.[2] Clinicians should inquire about the closest DaTscan capability in their area. We have sent patients from our tribal health center to a tertiary medical center for their DaTscan because nearby imaging programs do not offer them.

Rasagiline (Azilect), as a highly selective monoamine oxidase-B (MAOB) inhibitor, works only in the central nervous system and does not block amine oxidation in the gut; therefore, it does not provoke malignant hypertension or other excess stimulant adverse effects. Rasagiline has been found by some to slow the progression of Parkinson disease.

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**In Reply:** Thank you for your letter. We agree that DaTscans can help clarify whether Parkinson disease symptoms are associated with loss of dopaminergic neurons and that normal DaTscan findings can rule out symptoms attributed to the lack of dopamine. DaTscan has been approved by the U.S. Food and Drug Administration and is most useful in differentiating between Parkinson disease and atypical essential tremor. However, the DaTscan cannot differentiate between pure Parkinson disease and Parkinson-plus type syndromes (e.g., progressive supranuclear palsy, multiple system atrophy) because all of the syndromes result in dopaminergic loss.

DaTscan findings could point to drug-induced Parkinson disease, but a thorough medication review may also determine the diagnosis. A clinical evaluation from an experienced neurologist can be as accurate as a DaTscan for early Parkinson disease diagnosis.[1] DaTscans are not used quantitatively to monitor disease progression, and results can determine whether the dopaminergic activity is normal or impaired but cannot predict disease severity and should not be used before verifying clinical signs of Parkinson disease. Therefore, the DaTscan's role in diagnosing Parkinson disease is secondary to a thorough clinical history, physical evaluation, and medication review. If available locally, DaTscan should be used only when clinicians cannot differentiate between atypical essential tremor, Parkinson disease, or Parkinson-plus syndromes.[2]

All three MAOB inhibitors (i.e., selegiline [Eldypryl], rasagiline, and safinamide [Xadago]) are selective for MAOB over monoamine oxidase-A inhibitors. We agree that rasagiline is generally well tolerated and does not provoke malignant hypertension or other excess stimulant adverse effects. Two delayed-start trials explored rasagiline's neuroprotective potential.[3,4] The first study was relatively small (n = 404) and of short duration (24 weeks or 52 weeks of active treatment); results statistically favored earlier treatment, suggesting possible neuroprotection with rasagiline, but the trial had numerous limitations.[3] The second trial was larger (n = 1,176) with a longer duration (36 weeks or 72 weeks of active treatment) but had conflicting results between the 1-mg (significant disease-modifying effect) and 2-mg (no difference between early or delayed start) arms of the trial.[4] Based on these results, there is no conclusive evidence that rasagiline is neuroprotective in Parkinson disease. This finding is reflected in existing guidelines.[5,6]

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