To the Editor

Thrombocytopenia associated with coronavirus disease 2019 (COVID-19) during pregnancy has several important implications for performing safe anesthetic care, especially when urgent decisions about surgical delivery are made. In a review of recent literature, thrombocytopenia was present in 2 of 14 cases (14%) of COVID-19–positive patients undergoing neuraxial procedures with a lowest reported platelet count of 81,000 × 10^6/L. Although a “safe” platelet count for neuraxial anesthesia is imprecise, it is generally accepted that a platelet count of 70,000 × 10^6/L carries a low risk, and even lower levels can be considered for those at high risk for general anesthesia.

At our institution, we observed an unexpected case of severe maternal thrombocytopenia (24,000 × 10^6/L) in a 31-year-old woman (gravida 2, para 1) at 29 weeks and 6 days of gestation who presented for emergent cesarean delivery. The patient initially presented to the COVID-19 testing annex outside the emergency department (ED), after experiencing a cough for 1 week and developing a fever overnight of 102°F with decreased fetal movement at home. There were no contractions, leakage of fluid, or vaginal bleeding. She was directed to the labor and delivery triage for immediate evaluation.

Fetal heart rate (FHR) tracing showed minimal variability, late decelerations, no contractions, and biophysical profile score 2/10. A decision was made for immediate cesarean delivery. On preanesthetic evaluation, the patient reported a history of normal spontaneous vaginal delivery and bipolar disorder for which she had been on lamotrigine and gabapentin (off-label use). Prenatal laboratories from 5 months ago showed hemoglobin 13.5, hematocrit 40.2, and platelet count 212,000 × 10^6/L. Given clinical urgency indicated by category III FHR tracing, high respiratory risk associated with general anesthesia in a gravid patient with COVID-19, as well as the need to minimize potential health care worker exposure to severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) during urgent airway instrumentation, we elected to proceed with primary low-transverse cesarean delivery, and a baby girl (1330 g) was delivered with Apgar scores 3/5/7 at 1/5/10 minutes of life. The newborn was born vertex without crying and limp. There was absence of any breathing effort despite initial measures of drying, stimulating, placing over a warm mattress, and covering with plastic protection. Positive pressure ventilation was initiated, followed by intubation with 2.5 endotracheal tube, which resulted in improvement in tone and few spontaneous respiratory efforts.

Preoperative laboratories for the mother subsequently returned during the case with severe thrombocytopenia (24,000 × 10^6/L). Complete blood count was repeated using a fresh blood sample drawn an hour apart, and severe thrombocytopenia was confirmed when repeat platelet count returned 23,000 × 10^6/L. Several uterotonic agents and tranexamic acid were administered while the blood products were being prepared. The patient eventually received 2 single-donor apheresis units of platelets (equivalent to 12 units of pooled platelets), 2 units of fresh frozen plasma, and 2 units of packed red blood cells with stabilization of hemoglobin, hematocrit, and platelets as shown in the Table. The patient remained hemodynamically stable and did not require any supplemental oxygen. She regained full motor and sensory function on recovery from spinal anesthesia with no delayed neurological sequelae.

COVID-19 real-time polymerase chain reaction (RT-PCR) results returned positive for both mother and the newborn. On postoperative day (POD) 1, the patient underwent computed tomography (CT) chest, which showed subtle peripheral opacities in the lower lobes related to atelectasis, but overall lungs were clear without pleural effusion or signs of COVID-19 viral pneumonia. Hydroxychloroquine was not recommended as the patient was clinically stable. Postoperative course was uneventful without any neurological or hematological sequelae, and the patient was discharged on POD 3 with outpatient hematology referral and 4-week follow-up in postpartum clinic. The baby remains intubated for

### Table. Patient’s Complete Blood Count Before and After Surgery by POD

| Component     | Reference Range | Preoperative | POD 0 | POD 1 | POD 2 |
|---------------|-----------------|--------------|-------|-------|-------|
| WBC           | 4.3–11.00 × 10^9/µL | 5.6          | 11.4  | 11.5  | 7.6   |
| RBC           | 4.20–5.40 × 10^9/µL | 4.99         | 3.45  | 3.67  | 3.08  |
| Hemoglobin    | 12.0–16.0 g/dL   | 14.8         | 10.2  | 10.9  | 9.2   |
| Hematocrit    | 33.9–35.4 g/dL   | 33.5         | 30.2  | 33.4  | 32.6  |
| Platelet      | 150–450 × 10^3/µL| 24           | 110   | 135   | 146   |

Abbreviations: POD, postoperative day; RBC, red blood cell; WBC, white blood cell.

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**Unexpected Severe Thrombocytopenia in the COVID-19 Positive Parturient**

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respiratory distress syndrome secondary to prematurity and COVID-19 infection.

Thrombocytopenia has been associated with higher rates of severe disease and mortality in patients with COVID-19. Clinical characteristics of 1099 patients with laboratory-confirmed COVID-19 in China showed that 36.2% of patients had thrombocytopenia (<150,000/mm³). Thrombocytopenia was present at a higher rate in patients with severe disease (57.7%) compared to nonsevere disease (31.6%). Although these recent observations appear to suggest that thrombocytopenia is more prevalent in severe cases, an unexpectedly severe case of thrombocytopenia can also exist in nonsevere COVID-19 disease, as seen in our patient who had no signs of viral pneumonia on CT and required no supplemental oxygen throughout her hospitalization.

Currently, there is a lack of in vitro studies demonstrating the principal mechanism of thrombocytopenia in COVID-19. Other etiologies of moderate to severe thrombocytopenia during pregnancy include gestational thrombocytopenia, preeclampsia, hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome, and immune thrombocytopenia. Several mechanisms of COVID-19–associated thrombocytopenia can be postulated. One hypothesis is direct infection of bone marrow cells by the SARS-CoV-2, thereby inhibiting platelet synthesis. Destruction of bone marrow progenitor cells via cytokine storm in a relatively mild case of COVID-19 in our case seems rather unlikely. Alternatively, it is possible that platelet destruction is immune mediated. Interestingly, quinine-based antimalarial medications are one of the leading causes of drug-induced immune thrombocytopenia (DITP). Quinine-dependent antiplatelet antibodies might bind noncovalently to specific platelet surface antigens. Hydroxyquinoline therapy was not initiated, however, in our case. Neither lamotrigine nor gabapentin is implicated in DITP to our knowledge. Finally, thrombocytopenia might occur secondary to a concomitant thrombotic and consumptive process involving platelet aggregation and microthrombi formation, which are implicated in COVID-19.

Manifestation of severe thrombocytopenia in a COVID-19–positive parturient with mild symptoms is a novel occurrence and yet another unique attribute of this current pandemic. A rapid recognition of severe thrombocytopenia, if present in asymptomatic or even mildly symptomatic patients with COVID-19, is crucial for delivery of safe and optimal obstetrical anesthesia care.

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