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Immunomediated Sequential Dissection of Visceral Arteries: Dramatic Improvement After Steroid Therapy

To the Editor:

We present the case of a man with spontaneous, progressive, multivessel dissection of the abdominal arteries occurring a few days after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination. After a few days of conventional treatment, initiation of steroids and immunoglobulins produced a dramatic improvement of the clinical course, suggesting an immune-mediated causative mechanism.

CASE REPORT

A 50-year-old man presented with intense abdominal pain and vomiting for 2 days. The patient was a smoker and suffered from hypertension but had no clinical history. He had completed the SARS-CoV-2 vaccination cycle a few days earlier with BNT162b2 (Pfizer-BioNTech; New York, NY/Mainz, Germany). The abdominal computed tomography (CT) scan showed focal dissection of the celiac trunk with intramural hematoma reaching the splenic, hepatic, and gastric arteries without signs of intestinal ischemia (Figure 1). In analogy with the treatment of type B aortic dissection, antihypertensive therapy was started in the Intensive Coronary Care Unit, maintaining a systolic blood pressure target milder than usual to prevent intestinal ischemia. We started antiplatelet therapy with aspirin 100 mg and achieved pain control using paracetamol and morphine.

After 4 days, the patient experienced sudden rebound of abdominal pain and fever that were associated with the appearance on CT scan of bilateral thrombosis of the renal arteries with renal ischemia, due to probable dissection (Figure 2). We started anticoagulant therapy using unfractionated heparin. Inflammatory markers were increased, while procalcitonin and blood cultures had negative results. We excluded systemic vasculitis and collagen disease with rheumatologic evaluation, total-body fluorodeoxyglucose-positron emission tomography CT scan, and autoantibodies test. A control CT scan 4 days later demonstrated further dissection of the superior mesenteric artery.

Considering the evidence of an otherwise unexplained inflammatory response and the recent administration of a

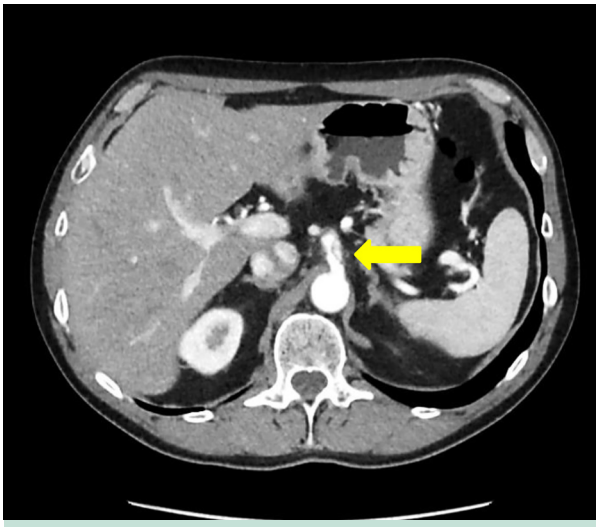

Figure 1 Focal dissection of the celiac trunk with intramural hematoma.

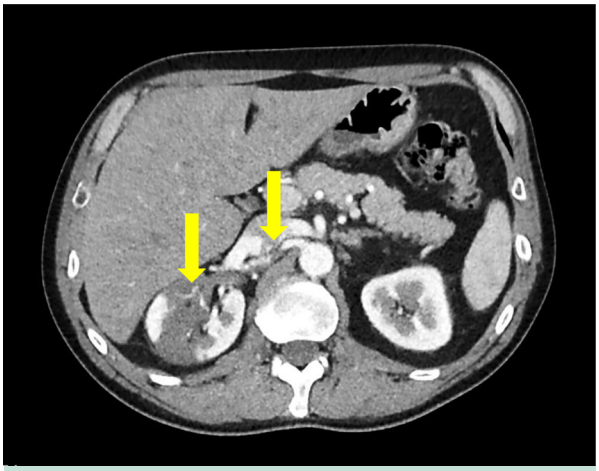

Figure 2 Right renal artery filling defect, extending for 8 mm and causing renal ischemia.

Abbreviations: arterial dissection, arterial dissection; immunomediated, immunomediated; steroid therapy, steroid therapy

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Requests for reprints should be addressed to Stefano Savonitto, MD, Division of Cardiology, Alessandro Manzoni Hospital, Via dell'Eremo, 9, 23900 Lecco, Italy.

E-mail address: s.savonitto@asst-lecco.it

SARS-CoV-2 m-RNA vaccine, treatment with corticosteroids (prednisone 1 mg/kg/d) and intravenous immunoglobulins (0.2 g/kg/d for 5 consecutive days) was started, in analogy with the recently described approach for SARS-CoV-2 vaccine-induced thrombotic thrombocytopenia and vaccine-related myocarditis.[1,2] We witnessed an immediate improvement of the clinical status and a fast decrease in the values of all inflammatory markers, with no evidence of further disease progression. The patient remained monitored with optimized antihypertensive therapy, warfarin, and aspirin. Opioids were rapidly de-escalated and parenteral nutrition was stopped while doses of corticosteroids were being reduced.

The patient was discharged 20 days later, with a tapering program of steroid therapy. At 2 months, a control CT scan showed normalization of the renal and superior mesenteric arteries, with residual isolated dissection of the celiac trunk. The patient remained asymptomatic, with well-controlled blood pressure.

DISCUSSION

Spontaneous dissection of visceral arteries without aortic involvement is rare. A similar clinical presentation is described in segmental arterial mediolysis, but in the absence of inflammation.[3] The natural history of this pathology remains unclear and guidelines for its management are not defined.[4] The clinical presentation can vary from mild symptoms to sharp abdominal pain, vomiting, abdominal distension, or diarrhea. The clinical course is unpredictable, as it can stabilize with progressive thrombosis of the false lumen or present progression of the dissection, obliteration of the true lumen and visceral ischemia, or rupture through the adventitia. In the absence of organ ischemia or impending arterial wall rupture, conservative treatment is the preferred strategy, using antithrombotics, analgesics, and antihypertensives. We decided to start immunomodulatory therapy considering the recent vaccine exposure, and the rapid clinical and laboratory response to immunoglobulins and steroids strongly suggested an immune-mediated pathogenesis.

Alessandra Pina, MD
Andrea Farina, MD
Stefano Savonitto, MD
Cardiovascular Department,
"A. Manzoni" Hospital − Lecco
(LC), Lecco, Italy

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