Pulmonary embolism following celiac plexus block and neurolysis

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Treatment of acute pain in chronic disease requires the physician to choose from an arsenal of pain management techniques tailored to the individual patient. Celiac plexus block and neurolysis are commonly employed for the management of chronic abdominal pain, especially in debilitating conditions such as cancer or chronic pancreatitis. The procedure is safe, well tolerated, and produces few complications. We present a case of pulmonary embolism following a celiac plexus block and neurolysis procedure. Further study is required to determine if celiac plexus ablation, alone or in combination with other risk factors, may contribute to increased risk for pulmonary embolism in patients seeking treatment for chronic upper abdominal pain conditions.

We present the first known reported case of pulmonary embolism following a celiac plexus block and neurolysis procedure in the outpatient pain clinic setting.

CASE PRESENTATION

A 23-year-old woman received a celiac plexus block with lidocaine and bupivacaine, followed by an ablation with 98% dehydrated alcohol diluted with Omnipaque 180 at the L1 level for pain related to chronic pancreatitis. The procedure was performed at an off-site pain management clinic. Within 20 minutes of beginning the procedure, the patient experienced a rapid onset of persistent, severe (10/10) right lateral chest pain with radiation to the center of her chest and below her right breast to the epigastric region, accompanied by dyspnea, palpitations, nausea, and vomiting.

She arrived at our emergency department (ED) within 30 minutes of symptom onset. Similar pain had not occurred in the past. Apart from her chronic abdominal pain, she denied any fever, chills, wheezing, hemoptysis, extremity swelling or pain, traumatic injury, diarrhea, constipation, or diaphoresis. The patient had driven 4 to 5 hours to the off-site pain clinic on the day of presentation. Although she had no recent surgeries, she indicated she had multiple hospitalizations, often for days to weeks at a time, for treatment of chronic pancreatitis. Medications included hydrocodone-acetaminophen (5/325 mg) and etonogestrel, which was implanted 3 weeks before the day of admission. She denied any tobacco, alcohol, or drug use.

No family members had venous thrombosis, blood clotting disorders, or vasculitis conditions.

Upon arrival at the ED, her blood pressure was 130/100 mm Hg; heart rate, 116 beats/minute; respirations, 18 breaths/minute; pulse oximetry, 98%; and temperature 99.7°F (37.6°C). She was mildly distressed, alert, oriented (×3), and cooperative. Physical exam disclosed only splinting with chest wall breathing movement. An abdominal exam revealed only mild, chronic, epigastric tenderness to palpation. Upper and lower extremities appeared normal with good pulses. The neurologic exam was normal. A 12-lead electrocardiogram in the ED demonstrated sinus tachycardia at a rate of 104 beats/minute, a S1QT3 pattern, and additional inverted T waves in V2 to V5 with normal ST segments and normal axis. A chest radiograph showed no acute findings. The lab results were significant only for carbon dioxide, 19 mmol/L; lipase, 107 U/L; and D-dimer, 1.05 µg/mL. A limited cardiac and pulmonary point-of-care ultrasound was normal. A computed tomography (CT) angiogram of the chest in the ED revealed nonocclusive pulmonary emboli, primarily within segmental branches of the left lower lobe and to a lesser extent the right lower lobe.

Treatment included aspirin, pain medication, and heparin bolus followed by continuous infusion. Upon admission, inpatient bedside sonography with color flow Doppler of the bilateral lower-extremity venous system showed no evidence of venous thrombosis. The patient was transitioned from heparin to apixaban for continued outpatient anticoagulation therapy. The anticardiolipin IgM level was 0.13 mg/dL (upper limit of normal 0.12), but IgG was normal. Factor V Leiden and prothrombin mutation markers were normal. The patient was discharged home with residual, but improved, mild pleuritic chest pain and occasional exertional dyspnea with instructions to follow up with her primary care physician. Two months after the ED visit, the patient had no recurrence of the chest pain or dyspnea or development of other thrombotic conditions.

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DISCUSSION

The celiac plexus block and neurolysis procedure is used for pain relief in selected painful upper abdominal conditions mediated by the celiac plexus, such as pancreatitis and upper abdominal cancer (1), and it may decrease the use of opioid pain medication use in such conditions (2). The block and neurolysis procedures differ by their anticipated duration of pain control. The block provides temporary pain relief with injection of long-acting anesthetics or corticosteroids, whereas neurolysis provides permanent pain relief via destruction of the celiac plexus with either ethanol or phenol (3). The neurolytic block is achieved when either 50% to 100% ethanol or phenol is injected into or around the celiac plexus of nerves surrounding the aorta that carry pain information of the upper abdominal organs through sympathetic, parasympathetic, and visceral sensory fibers. Injection of ethanol may produce severe pain, so anesthetics, such as lidocaine or bupivacaine, are often injected around the celiac plexus beforehand or concurrent with alcohol to effectively provide a block. The injection procedure takes 10 to 30 minutes to complete and is often accompanied by procedural sedation. Imaging guidance for placement is by fluoroscopy, endoscopic ultrasound, CT scan, or magnetic resonance imaging.

The celiac plexus block and neurolysis procedure is generally well tolerated. Transient back pain and shoulder pain may occur due to local tissue and diaphragmatic irritation, respectively. Transient diarrhea (4) and orthostatic hypotension (5) may occur due to sympathetic nerve blockade. Significant complications related to celiac plexus block are uncommon. One recent

study (6) demonstrated only four complications in 220 procedures. Paraplegia (7) as well as bowel and bladder dysfunction may result from inadvertent injection of anesthesia into a spinal artery. Pneumothorax, pericarditis, aortic dissection (8), and retroperitoneal abscesses have been reported in relation to the celiac plexus block. To date, we are unable to locate any reported cases of pulmonary embolism associated with the celiac plexus block.

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