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Clinical Communications: Adults

A CASE OF 5-FLUOROURACIL-INDUCED CARDIAC ARREST

Jordan C. Ray, MD,* Paul Cho,* Marc Dragon, MD,† and Charles G. Graham, MD†

*Department of Internal Medicine and †Department of Emergency Medicine, Mayo Clinic, Florida, Jacksonville, Florida
Reprint Address: Jordan C. Ray, MD, Department of Internal Medicine, Mayo Clinic, 4500 San Pablo Ave., Jacksonville, FL 32224

☐ **Abstract—Background: Coronary artery vasospasm after administration of fluorouracil (5-FU) is a rare complication. Commonly presenting as chest pain during or shortly after 5-FU infusions, vasospasm can place patients at risk for ventricular dysrhythmia, myocardial ischemia, and infarction. Although not fully understood, any 5-FU cardiotoxicity seems to be multifactorial, and patients with coronary artery disease and renal dysfunction may be at particular risk. Case Report: A 46-year-old woman with no prior cardiovascular disease history presented with sudden-onset chest pain after initial administration of 5-FU continuous infusion therapy. The patient subsequently developed ventricular fibrillation arrest and underwent successful electrocardioversion. Coronary angiography was unremarkable for coronary stenosis or vasospasm. The presumed etiology was secondary to 5-FU cardiac toxicity. The patient was re-challenged with 5-FU therapy and developed repeat chest pain. The 5-FU was completely stopped and the patient's symptoms resolved, with no further dysrhythmic events 9 months after initial presentation. Why Should an Emergency Physician Be Aware of This?: Patients who develop chest pain during or after 5-FU infusion should warrant strong consideration for admission and continuous cardiac monitoring for potential ventricular dysrhythmias and cardiac ischemia.** © 2016 Elsevier Inc.

☐ **Keywords—fluorouracil; cardiac arrest; ventricular tachycardia; chemotherapy; vasospasm; cardiotoxicity; FOLFOX**

INTRODUCTION

Fluorouracil, or 5-FU, is a preferred choice in many adjunctive and palliative chemotherapy regimens. It is the most common anticancer agent recommended for colorectal cancers (1,2). Generally well tolerated, common adverse reactions and side effects include myelosuppression, nausea, vomiting, and diarrhea. In rare cases, cardiogenic side effects such as coronary artery vasospasm, ventricular dysrhythmia, and cardiac ischemia have been reported (3). Both review articles and many case reports have established 5-FU cardiotoxicity; however, these reports remain primarily in cardiology and oncology literature (4–9). We present a case of a patient treated with 5-FU who presented to the emergency department (ED) with chest pain and sudden cardiac arrest after initial administration of continuous-infusion 5-FU chemotherapy.

CASE PRESENTATION

A 46-year-old woman was recently diagnosed with moderate-poorly differentiated adenocarcinoma and started on FOLFOX (leucovorin, 5-FU, oxaliplatin) therapy. She presented to the ED with intense crushing chest pain, tightness, and diaphoresis. The patient had just completed her latest 5-FU continuous infusion. The patient was evaluated approximately 4 h after symptom onset. An electrocardiogram (ECG) was obtained, which noted no acute ST changes (Figure 1). The patient was prescribed oxycodone/acetaminophen and noted complete resolution of her symptoms. Found to be low risk for acute coronary syndrome, the patient was discharged with presumed FOLFOX reaction and her oncologist was notified.

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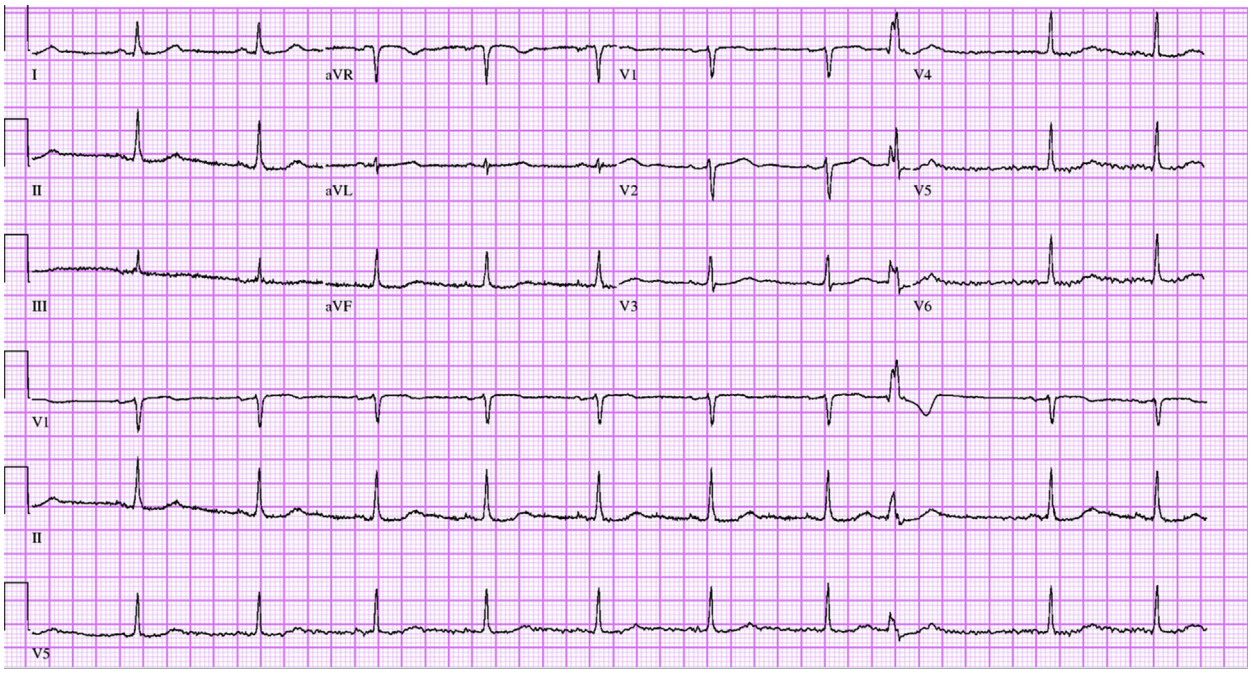

Figure 1. Initial 12 lead ECG showing no concerning ST segment or T wave abnormalities.

Aware of the risk of coronary vasospasm from 5-FU administration, he prescribed sublingual nitroglycerin for further episodes of chest pain and instructed the patient to return to the ED with recurrence of symptoms. At home the patient's husband witnessed a sudden loss of consciousness. A physician himself, he evaluated the patient, noting no pulse. Emergency medical services were notified and cardiopulmonary resuscitation was immediately administered. En route to the hospital the patient was found to be in ventricular fibrillation (Figure 2). After a second attempt at electrical cardioversion, spontaneous circulation returned. On presentation to the ED, initial ECGs noted diffuse ST-segment elevation (Figure 3). The patient was intubated and sedated and subsequently underwent coronary artery angiography, which revealed widely patent coronary artery anatomy (Figure 4) with no evidence of vasospasm or acute thrombosis. Echocardiography performed noted a global diffuse myocardial hypokinesis with a reduced ejection fraction of 20–30%. Laboratory evaluation noted a slightly increased troponin T of 0.09 ng/dL (normal < 0.01 ng/dL), which subsequently trended down to normal range. The patient was admitted to the intensive care unit for monitoring. The patient was discharged and provided with an external cardioverter-defibrillator device.

Upon her return oncology appointment, it was decided that the patient would continue FOLFOX adjuvant therapy with admission to the cardiology telemetry unit for continuous cardiac monitoring. Prior to chemotherapy administration, repeat echocardiography noted an improved systolic function, and her ECG returned back to base line. On the second day of the infusion, the patient experienced intense crushing chest pain, despite the use of long-acting nitrates and calcium channel blockers. Repeat ECG examination (Figure 5) revealed ST depressions with concurrent T-wave inversion concerning for ischemia. The 5-FU infusion was immediately stopped and intravenous nitroglycerin

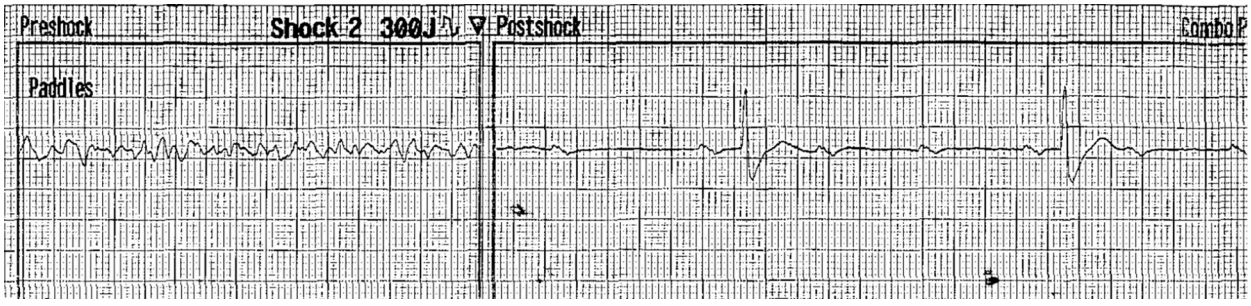

Figure 2. ECG tracing showing ventricular fibrillation converting to sinus rhythm following electrocardioversion.