Myopericarditis From Bevacizumab/5-Fluorouracil (5-FU) in a Patient Presenting With ST-Elevation Myocardial Infarction (STEMI): A Case Report

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Background

5-fluorouracil (5-FU) and its oral prodrug capecitabine, are extensively utilized with bevacizumab as first-line chemotherapy for metastatic colorectal cancer. These agents are associated with a range of cardiotoxic effects that can be clinically significant.

Case presentation:

We report a case of a Caucasian male in his 70's (**Figure 1**) who experienced chest discomfort and electrocardiography features of ST-elevation myocardial infarction (**Figure 2**) on the background of receiving adjuvant 5-FU and bevacizumab, following high anterior resection for node-positive metastatic sigmoid adenocarcinoma. Urgent coronary angiography revealed unobstructed coronary arteries (**Figure 3**), and cardiac magnetic resonance imaging (**Figure 4**) confirmed the diagnosis of myopericarditis.

Ethical compliance: Informed consent was obtained from patient.

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Imaging

Figure 1: Medical history timeline

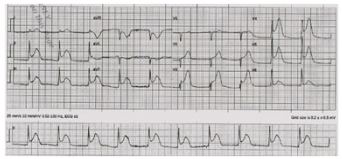

Figure 2: STEMI pre-notification

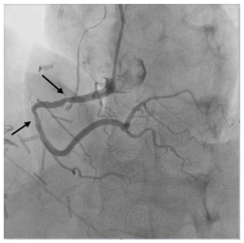

Figure 3: Mid RCA stenosis with TIMI III flow

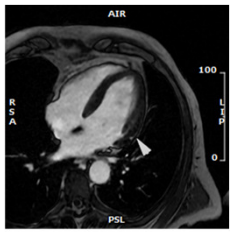

Figure 4: LGE in subepicardial lateral segments

Discussion and Learning Points

1. The degradation product of 5-FU (α-fluoro-β-alanine) is converted into fluorocitrate, which disrupts the citric acid cycle and results in the accumulation of citrate, the subsequent depletion of high-energy ATP and ischaemia[1]
2. The Heart Failure Association–International Cardio-Oncology Society (HFA-ICOS) tool can identify high-risk patients requiring close follow-up[2]
3. Pharmacokinetic-guided dosing, rather than body surface area adjustment, has been shown to reduce 5-FU toxicity and improve survival[2]
4. For those who develop cardiotoxicity, rechallenge may be cautiously attempted with vasodilator prophylaxis (e.g., diltiazem and isosorbide mononitrate) and close telemetry[2]
5. CMR can distinguish myopericarditis from infarction or Takotsubo cardiomyopathy

Conclusion:

The temporal association with chemotherapy, in the absence of other identifiable causes, strongly implicated 5-FU as the causative agent, with a possible contributory role of coronary vasospasm.

Keywords : Fluoropyrimidines, capecitabine, bevacizumab, myopericarditis, coronary vasospasm, acute coronary syndrome, case report

Reference:
1. Matsubara I, et al.; Cardiotoxic effects of 5-fluorouracil in the guinea pig. JpnJPharmacol
2. Gamelin E. Et al.; Individual Fluorouracil Dose Adjustment Based on Pharmacokinetic Follow-Up Compared With Conventional Dosage: Results of a Multicenter Randomized Trial of Patients With Metastatic Colorectal Cancer. JCO 26:2099–2105