Takotsubo cardiomyopathy in a patient with Lynch syndrome

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See Online for appendix

See Online for video

A 55-year-old woman with a 3-day history of abdominal pain and vomiting was admitted to our hospital. 7 days earlier she had a subtotal gastrectomy for poorly differentiated adenocarcinoma—stage T2N1M0.

24 h after admission, the patient was transferred to the cardiology ward for the management of chest pain associated with a raised high-sensitivity Troponin I concentration (342 ng/L; normal range <14).

The patient had a history of previous surgical operations—she had been diagnosed with Lynch syndrome with a confirmed *MLH1* gene mutation. At the age of 48 years, she had a moderately differentiated adenocarcinoma of the colon and had a right hemicolectomy, prophylactic salpingo-oophorectomy, and adjuvant chemotherapy and radiotherapy. 2 years later, she had a laparoscopic proctocolectomy and end ileostomy. She had a thalamic stroke aged 51 years; she was treated for hypertension, hypercholesterolaemia, and chronic obstructive pulmonary disease. She had recently stopped smoking, which she had done for more than 30 years.

In her family history, her paternal uncle had bowel and stomach cancer and his daughter had bowel and breast cancer.

On examination, we found the patient to be unwell and reporting abdominal pain; she was hypotensive with a blood pressure of 92/57 mm Hg—she had managed to drink only small amounts of fluid prior to coming to hospital. Her pulse rate was 92 beats per min and her oxygen saturation was 97%.

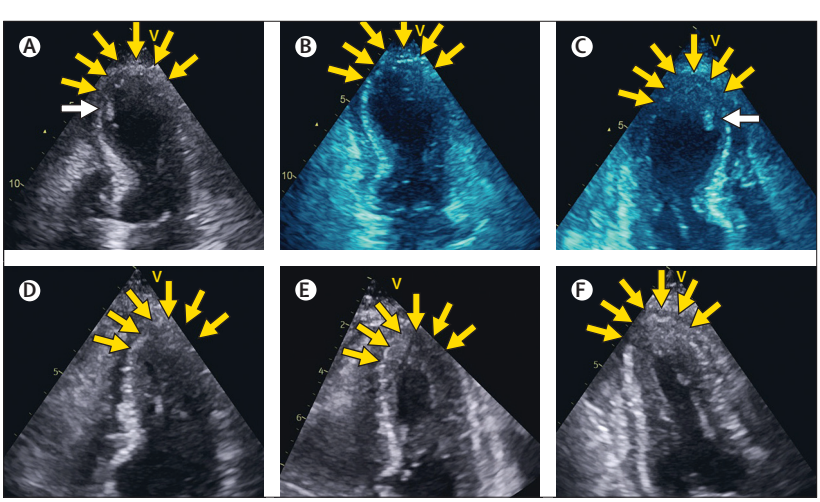

Figure: **Takotsubo cardiomyopathy in a patient with Lynch syndrome**
End systolic frames of transthoracic echocardiography at admission show a dyskinetic area of the left ventricular apical segment (yellow arrows) and a small apical thrombus (white arrow) from an apical 4-chamber view (A), an apical 2-chamber view (B), and an apical 3-chamber view (C). End systolic frames of transthoracic echocardiography 2 weeks after admission show full recovery of the left ventricular function (yellow arrows) and complete resolution of the apical thrombus from an apical 4-chamber view (D), an apical 2-chamber view (E), and an apical 3-chamber view (F).

After intravenous fluid replacement the patient's vital signs stabilised. An electrocardiogram showed a biphasic P wave in lead V1 and isoelectric T waves in the limb leads (appendix). Transthoracic echocardiography showed apical ballooning and a small thrombus in the dyskinetic apical segment with basal hyperkinesis (figure); the patient was started on dalteparin and dual antiplatelet therapy, and high-intensity statin treatment. Because we considered the patient to be too frail to have coronary angiography, she was treated with guideline-directed medical therapy for left ventricular systolic dysfunction. The patient's condition stabilised and she reported no further chest pain.

2 weeks later, transthoracic echocardiography showed full recovery of the left ventricular apical dyskinesis, and the ejection fraction had increased from 45% to a range of 55–60% (normal range 50–70%; figure). Additionally, the small left ventricular thrombus had almost completely resolved.

Considering the patient's presenting symptoms, transient left ventricular dysfunction—dyskinetic apical segment with basal hyperkinesis—we established a diagnosis of Takotsubo cardiomyopathy (figure; video).

The patient remained stable and continued to be prescribed clopidogrel, bisoprolol, dapagliflozin, ramipril, and warfarin.

Takotsubo cardiomyopathy is a clinical syndrome that typically presents as chest pain mimicking acute coronary syndrome; the term was originally used to describe apical ballooning of the left ventricle. Incidence is higher in postmenopausal women due to low levels of oestradiol. Additionally, a chronic inflammatory state, major surgical intervention, chemotherapy, as well as the emotional stress, are potential risk factors in oncology patients—notably present in our patient—that may result in the development of Takotsubo cardiomyopathy.

The development of Takotsubo cardiomyopathy in someone with Lynch syndrome has not, as far as we are aware, previously been described. Compared with Lynch syndrome, the genetic mechanism of Takotsubo cardiomyopathy is still poorly understood. However, variants of adrenergic receptors and epigenetic changes in their expression are thought to be contributory; no evidence of a genetic overlap between Takotsubo cardiomyopathy and Lynch syndrome is apparent.

Contributors
We were all involved in providing care for the patient and writing the manuscript. Written consent for publication was obtained.

Declaration of interests
We declare no competing interests.