

Ergometrine-induced coronary artery vasospasm post caesarean section and postpartum haemorrhage in patient identifying as a Jehovah's Witness

Dr Byron Dunstone, Department of Obstetrics & Gynaecology, Toowoomba Hospital, QLD, Australia
Byron.Dunstone@health.qld.gov.au

Background

- Ergometrine is a commonly used medication in obstetrics to improve uterine tone in the treatment and prevention of postpartum haemorrhage. It also has action on vascular smooth muscle with the common side effect of hypertension¹.
- This case highlights management of ergometrine-induced coronary artery vasospasm presenting as acute coronary syndrome in a woman identifying as a Jehovah's Witness concurrently being managed for postpartum haemorrhage.

Aims

- To increase awareness as to potential side effect of coronary artery vasospasm in commonly used uterotonic agent ergometrine.

Case

- A 36 year old Filipino woman, identifying as a Jehovah's Witness (JW), underwent repeat elective caesarean section at 39 weeks gestation. Her preoperative Haemoglobin was 132g/L.
- Total intraoperative blood loss was 400ml. Postpartum haemorrhage occurred in theatre recovery secondary to uterine atony. Uterotonics were administered including two doses of 250mcg ergometrine intramuscularly. The patient was returned to theatre for an examination under anaesthetic (EUA) + Bakri insertion with a total estimated blood loss of 1.5L since pre-delivery.
- 90 minutes post second dose of ergometrine, a medical emergency team (MET) call was initiated for hypotension with blood pressure 70/45mmHg, bradycardia of 45 beats per minute, dyspnoea and chest pain. Chest pain ceased 15 minutes post onset, after administration of sublingual nitroglycerin and correction of hypotension with metaraminol and ephedrine. ECG showed acute ST elevation in leads II, III & AVF with reciprocal change. Hypertension ensued and a GTN patch was administered with a goal of normotension whilst maintaining mean arterial pressure >65mmHg.
- Urgent cardiology + ICU review occurred. Bedside echocardiogram showed mild mitral valve regurgitation without any regional wall motion abnormalities. Cardiology impression was concerning for acute inferior ST-elevation myocardial infarction (STEMI). 300mg aspirin was prescribed with a plan for serial troponins. Given JW status, risk of further blood loss and further cardiac instability, decision to transfer to a tertiary hospital with facilities for both percutaneous coronary intervention and obstetric capabilities was made and interhospital transfer arranged. Nil further cardiac concerns arose during admission and the patient was discharged 6 days post-partum with a plan for outpatient cardiology follow-up, of which investigations were unremarkable (described in results section below).

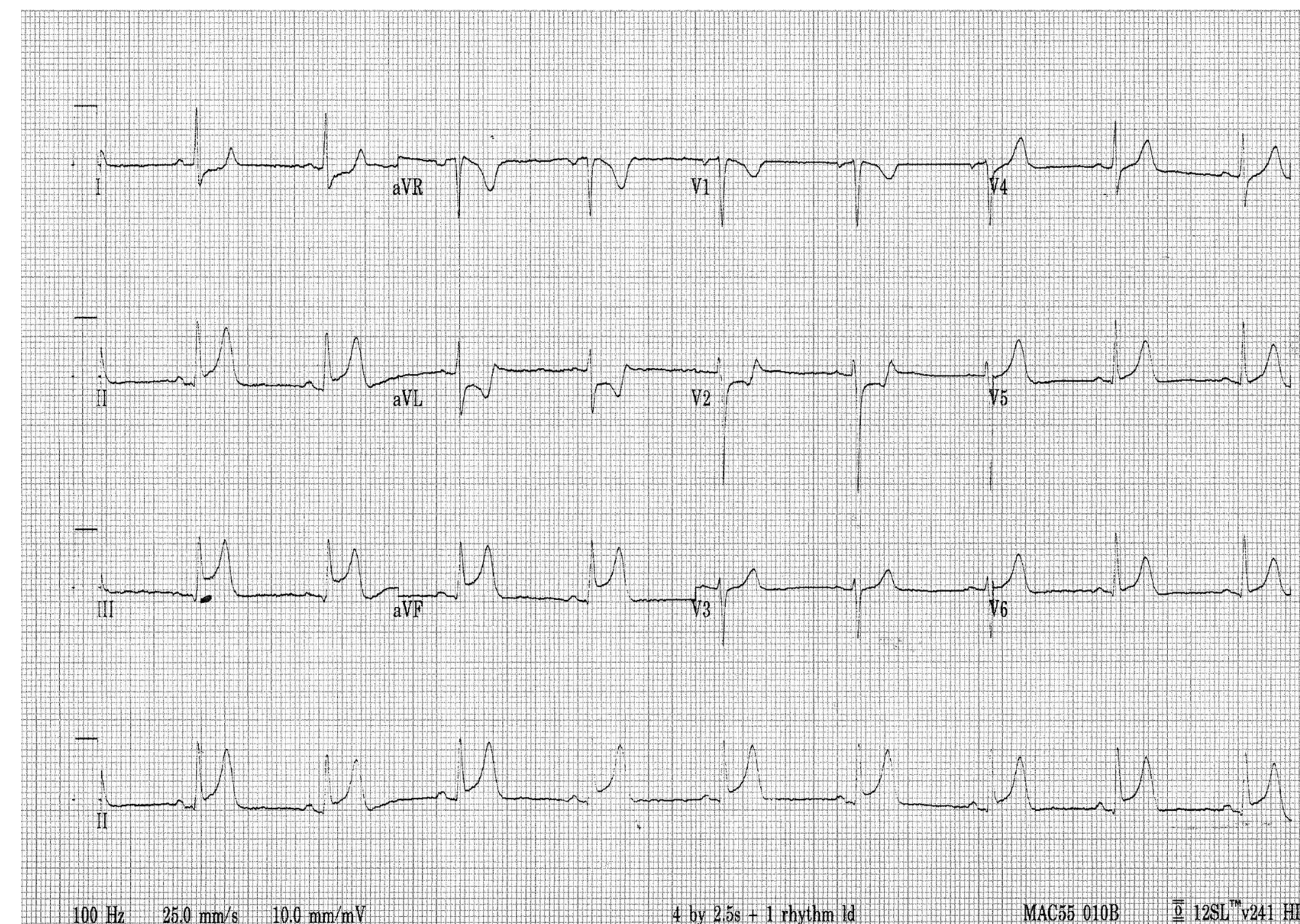


Figure 1. Patient's electrocardiogram performed at time of MET call. Note ST elevation in inferior leads.

Results

- ECG at time of MET call showed ST elevation in leads II, III, and AVF concerning for inferior STEMI. These changes had resolved on ECG performed 30 minutes post onset of pain. Initial cTroponin I (Atellica) = 1ng/L. Repeat troponin 3hrs later = 18ng/L, with a Z-score of 5.91. Given resolution of symptoms and nil ongoing signs of cardiac ischaemia, CT coronary angiography was delayed until breast tissue would be less sensitive to radiation and was performed 3 months postpartum. This did not reveal any obstructive coronary artery disease. Calcium score was equal to 2.
- Exercise stress echocardiography performed 4 months post-partum was essentially normal, showing no echocardiographic evidence of inducible ischaemia.
- Of note the patient was normotensive antenatally however at cardiology follow-up 3 and 4 months postpartum, blood pressure was 180/120mmHg and 208/110mmHg respectively. Investigations for secondary hypertension were unremarkable. The patient did have a significant family history of ischaemic heart disease.



Darling Downs Hospital
and Health Service

Discussion

- Ergometrine is an ergot-alkaloid and is used in obstetrics to induce contraction of uterine smooth muscle for prevention, or treatment, of postpartum haemorrhage. It can also act upon vascular smooth muscle leading to vasoconstriction¹.
- Ergometrine has previously been used in cardiac catheterisation laboratories as a provocation test for coronary artery vasospasm where complications of refractory vasospasm have led to myocardial infarction². Prompt diagnosis of coronary artery vasospasm is essential to prevent potential associated sequelae such as myocardial infarction, arrhythmia, heart failure or death.
- Initial treatment of acute coronary syndrome includes sublingual nitroglycerin, as well as consideration of thrombolytic, beta-blockade, antiplatelet, parenteral anticoagulant therapy, and percutaneous coronary intervention³.
- The difficulty in the obstetric population is that this can occur in the setting of haemorrhage, which was compounded in this case by the patient being concurrently managed for postpartum haemorrhage and not being accepting of blood products secondary to religious beliefs. Nitroglycerin is also used in obstetrics for uterine relaxation which can compound further blood loss.
- In the differential diagnosis of spontaneous coronary artery dissection, if parenteral anticoagulation was administered then the possibility of accentuating bleeding into a intramural haematoma leading to extension of the dissection could also occur and needs to be balanced between the risk of thrombus formation².
- For such a clinical picture as described for this patient, a multidisciplinary approach to care is essential. This was evident in this case through involvement of cardiology, obstetrics, anaesthetics and coronary care unit in management decisions which ultimately led to a positive outcome.

References

1. New Zealand Medicines and Medical Devices Safety Authority. Datasheet: D.B.L @ Ergometrine Injection 0.2mg/mL. [Internet]. [cited 2024 May 2]. Available from: <https://www.medsafe.govt.nz/profs/datasheet/d/dblergometrineinj.pdf>
2. Buxton A, Goldberg S, Hirshfeld JW, Wilson J, Mann T, Williams DO, Overlie P, Oliva P. Refractory ergonovine-induced coronary vasospasm: Importance of intracoronary nitroglycerine. *J Am Coll Cardiol*. 1980; 46(2):329-34.
3. Aziz S. Spontaneous coronary artery dissection. *E-Journal of Cardiology Practice*. 2017;14(38). Available from: <https://www.escardio.org/Journals/E-Journal-of-Cardiology-Practice/Volume-14/spontaneous-coronary-artery-dissection>