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Friedreich's sign

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DESCRIPTION

An 82-year-old man with chronic atrial fibrillation treated with anticoagulation was admitted to the hospital for subacute progressive exertional dyspnoea. On examination, the jugular venous waveform was elevated to the mandibular angle with the patient sitting upright. Heart sounds were muffled. Transthoracic echocardiography (TTE) revealed a large circumferential pericardial effusion with early tamponade physiology. Pericardiocentesis yielded a large volume of sanguineous fluid. Following the procedure, there was improvement in jugular venous pressure to 14 cm H₂O. The height of the waveform increased with inspiration (Kussmaul's sign) and there was a prominent y descent, known as Friedreich's sign (see [video 1](#)). Repeat TTE revealed thickened pericardium, early diastolic septal bounce and respirophasic changes in early diastolic filling consistent with constrictive pericardial physiology. Friedreich's sign is a physical finding of constrictive pericarditis. The normal jugular venous waveform contains two descents, x and y. The x descent, which corresponds to the combination of right atrial relaxation and depression of the atrial floor during ventricular contraction, is normally dominant. The y descent occurs as a result of passive ventricular filling during early diastole and is usually absent in patients with tamponade. In constrictive pericarditis,

the characteristic sharp and deep y descent reflects rapid filling in early diastole which occurs when the unyielding pericardium elevates atrial pressure and limits ventricular filling to the early diastolic period. This patient was managed with diuretics, and the constrictive physiology resolved over a period of weeks. The aetiology of transient pericardial disease in this case was not definitively determined. Virtually any cause of acute pericarditis can lead to constriction which usually develops months to years later as a result of irreversible pericardial fibrosis. In some cases, particularly in association with tamponade, transient acute constriction may ensue for days to weeks following the initial pericardial insult as a result of reversible inflammation and oedema.¹⁻³

Learning points

- ▶ Friedreich's sign, originally coined *Friedreich's diastolic collapse of the cervical veins*, describes a sharp and deep y descent of the jugular venous waveform. It can be a clue to the diagnosis of constrictive pericarditis.
- ▶ Preservation of both the x and y descents of the jugular venous waveform in patients with constrictive pericarditis is a distinguishing feature from cardiac tamponade, in which the y descent is typically absent.
- ▶ Transient constrictive pericarditis is characterised by an acute decrease in pericardial compliance due to inflammation and oedema, in contrast to the irreversible chronic fibrocalcific changes of classic constrictive pericarditis.



Video 1 Friedreich's sign: the prominent y descent of the jugular venous waveform seen with constrictive pericarditis.

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REFERENCES

- McGee SR. *Evidence-based physical diagnosis*. 4th edn. Philadelphia, PA: Elsevier, 2018.
- Spodick DH. *The pericardium: a comprehensive textbook*. New York, NY: Marcel Dekker, Inc, 1997.
- Syed FF, Schaff HV, Oh JK. Constrictive pericarditis--a curable diastolic heart failure. *Nat Rev Cardiol* 2014;11:530-44.



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