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# Mitral Stenosis

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## DESCRIPTION

A previously healthy 29-year-old Mexican woman presented to an emergency department with transient hemiparesis and dysarthria. There was no evidence of stroke on cross-sectional imaging of the head, and she was discharged without a clear diagnosis. Two days later, she returned with acute abdominal pain. Abdominal imaging revealed complete occlusion of the right renal artery, prompting emergency embolectomy. Following the procedure, she developed acute haemoptysis, dyspnoea and hypoxaemia. Chest imaging demonstrated evidence of pulmonary venous hypertension. Cardiac auscultation revealed an opening snap followed by a diastolic murmur with presystolic accentuation. These sounds were better appreciated in combination with phonocardiography, a technique supplanted by echocardiography in the 1970s<sup>1</sup> that visualised heart sounds (video 1). An echocardiogram confirmed the presence of mitral stenosis (MS), unifying the syndrome of embolic phenomena, haemoptysis and pulmonary hypertension. She underwent successful mitral valve replacement and has since returned to normal activities.

Despite the advances in developed countries, rheumatic heart disease remains the most common cause of MS worldwide. Early manifestations

include dyspnoea and fatigue, but occasionally embolic phenomena are part of the initial presentation. Definitive diagnosis can be made with echocardiography, but careful cardiac auscultation remains an important step in the diagnostic pathway when any of the following four signs are present: (1) pronounced S1, (2) early diastolic opening snap, (3) rumbling diastolic murmur at the apex using the bell and (4) presystolic accentuation of the murmur.<sup>2</sup> In this case, phonocardiography was used to facilitate recognition of these signs.

## Learning points

- ▶ Mitral stenosis due to rheumatic heart disease can present with embolic phenomena even in the absence of underlying atrial fibrillation.
- ▶ Diastolic murmurs can be difficult to detect, but in the adult population carry a relatively narrow differential diagnosis of primarily aortic insufficiency and mitral stenosis.
- ▶ Phonocardiography remains useful today as a learning tool to aid in the appreciation of heart sounds.

**Contributors** PDS captured the audio of the heart sounds. AMM captured the phonocardiogram using the antique phonocardiograph. ACO created the video combining the heart sounds audio with the phonocardiograms. ACO, PDS and AMM were involved in writing the manuscript.

**Competing interests** None declared.

**Patient consent** Obtained.

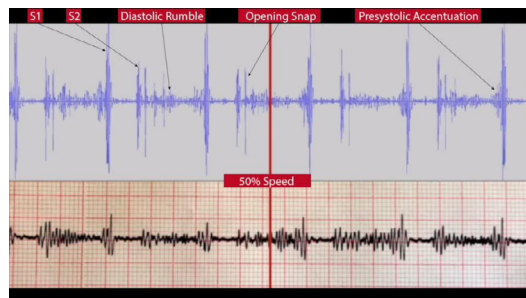
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## REFERENCES

- 1 Rosenthal RL. Throw the stethoscope away: a historical essay. *Am J Cardiol* 2013;111:1823–8.
- 2 Chandrashekar Y, Westaby S, Narula J. Mitral stenosis. *The Lancet* 2009;374:1271–83.



**Video 1** Audio of the heart sounds combined with phonocardiography (top phonocardiogram from a contemporary electronic stethoscope, bottom from a mid-20th century antique phonocardiograph), recorded over the apex of the heart demonstrating: (1) an abrupt, high amplitude S1, (2) an opening snap, (3) the low rumbling diastolic murmur of MS and (4) presystolic accentuation of the murmur.



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