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IMAGES IN CARDIOLOGY

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The “mobile-phonocardiogram”, a new tool in the arrhythmia clinic

A 20 year old man presented to our clinic complaining of palpitations. He had been under cardiological follow up since childhood for a symptom-free ventricular septal defect. He took no medication and was fit and well. He played sport twice per week, did not smoke or drink excess alcohol. He had felt palpitations occasionally since age 15 but they had recently become more frequent, especially at rest after playing sport. On one of these occasions he had recorded his own cardiophonogram using a mobile phone handset pressed against his chest. Physical examination demonstrated a grade 4/6 ejection systolic murmur. His resting ECG was normal. He achieved

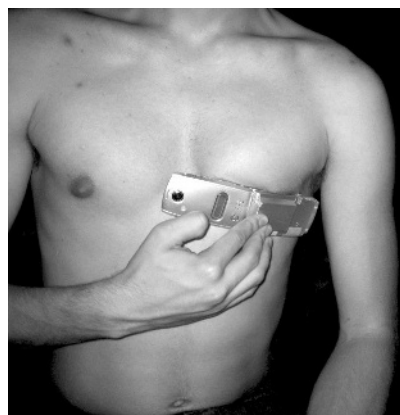
stage 5 of the Bruce protocol; this did not induce symptoms. A two dimensional echocardiogram demonstrated a ventricular septal defect with a 1:1.2 shunt. Three dimensional echocardiography revealed three 3 × 3 mm defects just below the tricuspid valve. The right heart was not dilated. A 24 hour Holter monitor showed normal sinus rhythm throughout with occasional supraventricular ectopics.

We analysed the phonocardiogram using commercially available audio editing software. His heart rate was clearly discernible as a regular 76 beats per minute. On examination of his phonocardiogram the first heart sound and his murmur are clearly visible, despite small

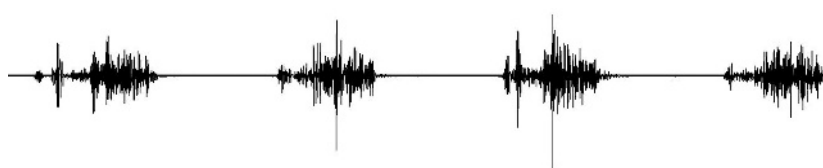
amounts of interference. His diastolic interval was constant, ruling out tachy- or bradyarrhythmias.

Mobile telephones have become ubiquitous in developed societies over the last 10 years. Increasingly, the devices have a functionality which has been attempted to be put to use for medical uses outside of their communication role—for example, ambulatory ECG monitoring. Our patient used his mobile phone to perform and record part of the routine cardiac examination while he was experiencing symptoms, which was later used as an invaluable aid to his diagnosis.

M Finlay, A Porter, K Fox
mcfinlay@doctors.net.uk



Patient demonstrating method used in self-recording heart sounds during palpitations.



The audio waveform derived from the mobile phone recording during palpitations.



The "mobile-phonocardiogram", a new tool in the arrhythmia clinic

M Finlay, A Porter and K Fox

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