- intravenous streptokinase, oral aspirin, both, or neither, *BMJ* 1998;**316**:1337–43.
- 22 **Antithrombotic Trialists' Collaboration.** Collaborative meta-analysis of randomized trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. *BMJ* 2002;**328**:71–86.
 - 23 **ISIS-1 Collaborative Group.** Randomized trial of intravenous atenolol among 16027 cases of suspected acute myocardial infarction: ISIS-1, First International Study of Infarct Survival Collaborative Group. *Lancet*, 1986;ii, 57–66.
 - 24 **GISSI-3 Investigators.** Effects of lisinopril and transdermal glyceryl trinitrate singly and together on six-week mortality and ventricular function after acute myocardial infarction. Gruppo Italiano per lo Studio della Sopravvivenza nell'infarto Miocardico. *Lancet* 1994;**343**:1115–22.
 - 25 **Latini R, Santoro E, Masson S, et al.** GISSI-3. Aspirin does not interact with ACE inhibitors when both are given early after acute myocardial infarction: results of the GISSI-3 trial, *Heart Dis* 2000;**2**:185–90.
 - 26 **Aversano T, Aversano LT, Passamani E, et al.** Atlantic Cardiovascular Patient Outcomes Research Team (C-PORT). Thrombolytic therapy vs primary percutaneous coronary intervention for myocardial infarction in patients presenting to hospitals without on-site cardiac surgery: a randomized controlled trial, *JAMA* 2002;**287**:1943–51.
 - 27 **Bonnefoy E, Lapostolle F, Leizorovicz A, et al.** Comparison of Angioplasty and Prehospital Thrombolysis in Acute Myocardial Infarction (CAPTIM) study group. Primary angioplasty versus prehospital fibrinolysis in acute myocardial infarction: a randomised study, *Lancet* 2002;**360**:825–9.
 - 28 **The SoS Investigators.** Coronary artery bypass surgery versus percutaneous coronary intervention with stent implantation in patients with multivessel coronary artery disease (the stent or surgery trial): a randomised trial. *Lancet* 2002;**360**:965–70.
 - 29 **MacMahon S, Peto R, Cutler J, et al.** Blood pressure, stroke, and coronary heart disease. Part 1. Prolonged differences in blood pressure: prospective observational studies corrected for the regression dilution bias, *Lancet* 1990;**335**:765–74.
 - 30 **Collins R, Peto R, MacMahon S, et al.** Blood pressure, stroke, and coronary heart disease. Part 2. Short-term reductions in blood pressure: overview of randomised drug trials in their epidemiological context, *Lancet* 1990;**335**:827–38.
 - 31 **Tomassini HC, Alves MG, Claro LB, et al.** [Demographic and mortality trends in Niteroi, Rio de Janeiro, Brazil, 1979 to 1997]. *Cad Saude Publica* 2003;**19**:1621–9.
 - 32 **Pan American Health Organization.** *Health in the Americas*, 1998 edn, vol 2. Scientific publication no 569. Washington: Pan American Health Organization, 1998.
 - 33 **Messite J, Stellman SD.** Accuracy of death certificate completion: the need for formalized physician training. *JAMA* 1996;**275**:794–6.
 - 34 **Lloyd-Jones DM, Martin DO, Larson MG, et al.** Accuracy of death certificates for coding coronary heart disease as the cause of death. *Ann Intern Med* 1998;**129**:1020–6.
 - 35 **Ezzati M, Hoon SV, Rodgers A, et al.** Comparative Risk Assessment Collaborating Group. Estimates of global and regional potential health gains from reducing multiple major risk factors. *Lancet* 2003;**362**:271–80.

IMAGES IN CARDIOLOGY

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A case of "sleeping PC" cardioversion

A 75 year old man developed sudden onset, central, crushing, chest pain at rest. He was brought into hospital by ambulance. Cardiac monitoring in the ambulance captured the onset of asymptomatic ventricular tachycardia (VT) (upper panel). Intravenous amiodarone was drawn up and about to be administered when the ambulance drove over a speed bump at 5 mph. The patient was cardioverted into sinus rhythm by the jolt from the "sleeping policeman" (lower panel). On admission to hospital the patient was in sinus rhythm but was transferred to coronary care for monitoring. The VT was asymptomatic and the patient's only recollection of the journey was the extremely bumpy ride.

A precordial thump, which produces an electrical depolarisation of 2–5 J, can cardiovert ventricular tachyarrhythmias. Coughing or Valsalva induced cardioversion has also been reported. Indeed, any acute mechanical stimulation can trigger ectopic myocardial excitation which, depending on timing and circumstance, may either initiate or terminate VT.

Thus, a correctly timed, moderate precordial mechanical impact can cause sudden arrhythmic cardiac death without causing structural damage to the heart (commotio cordis). This could be due to mechanical activation of cation selective channels and swift, impulse-like mechanical stimulation over relatively small areas (4–5 cm) of the precordium early in the T wave are most arrhythmogenic.

In contrast, slow compression or violent shaking of the chest, as occurred in this case, is usually unable to trigger the ectopic excitation necessary for cardioversion, making this case unusual.

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