showed that complex ventricular arrhythmias and age at admission, but not maximum heart rate, predicted progression (table 1).

DISCUSSION

Sudden death and sustained or non-sustained ventricular tachycardia induced during exercise testing in patients with chagasic myocarditis has been reported.⁴ However, the relation between ventricular arrhythmias detected during stress testing in patients with mild forms of Chagas disease and the progression of the cardiac disease has not been evaluated. In this study we report, for the first time, that complex ventricular arrhythmias observed during stress testing have prognostic value for the progression of early chronic Chagas heart disease.

Complex ventricular arrhythmias during stress testing are a clinical marker of the slow, continuous evolution of chronic myocarditis. Therefore, the early detection of ventricular dysfunction is relevant for the appropriate management of these patients, including closer follow up and, eventually, specific chemotherapy for *T cruzi* to prevent progression to more severe stages of cardiac disease.

Authors' affiliations

R Viotti, C Vigliano, B Lococo, M Petti, G Bertocchi, F De Cecco, M G Alvarez, A Armentí, Hospital Eva Perón, Servicio de Cardiología, Sección Chagas e Insuficiencia cardíaca, San Martín, Buenos Aires, Argentina
S Laucella, Instituto Nacional de Parasitología Dr Mario Fatala Chabén, Buenos Aires, Argentina

Correspondence to: Dr Rodolfo Viotti, José Hernández 3440, Villa Ballester, Buenos Aires, Argentina ZC 1653; peron@millicom.com.ar

Accepted 8 June 2005

REFERENCES

- 1 Elizari MV, Chiale PA. Cardiac arrhythmias in Chagas' heart disease. *J Cardiovasc Electrophysiol* 1993;**4**:596–608.
- 2 Kuschner E, Sgammini H, Castro R, et al. Valoración de la función cardíaca por angiografía radioisotópica, en pacientes con cardiopatía chagásica crónica. *Arg Bras Cardiol* 1985;**45**:249–56.
- 3 Viotti R, Vigliano C, Laucella S, et al. Value of echocardiography for diagnosis and prognosis of chronic Chagas disease cardiomyopathy without heart failure. *Heart* 2004;**90**:655–60.
- 4 de Paola AA, Gomez JA, Terzian AB, et al. Ventricular tachycardia during exercise testing as a predictor of sudden death in patients with chronic chagasic cardiomyopathy and ventricular arrhythmias. *Br Heart J* 1995;**74**:293–5.

IMAGES IN CARDIOLOGY

doi: 10.1136/hrt.2005.071621

The "butterfly" sign of the undilatable lesion

The vast majority of patients undergoing percutaneous coronary intervention (PCI) these days are treated with stent insertion uneventfully. Often, in simple cases, pre-dilatation with a balloon is not even performed (so-called "direct" stenting). In more complex cases, varying degrees of resistance of the lesion to balloon expansion are experienced, and these may require multiple balloon pre-dilatations to higher pressure and larger sizes before the stent can be implanted. A truly undilatable lesion is an unpredictable, fearsome and, mercifully, rare finding. It is usually associated with visible calcification at fluoroscopy in the presence of severe, concentric, and advanced coronary atherosclerosis.

When encountered before stent insertion, the lesion may be treated with high pressure, non-compliant balloon inflation, upsizing of the balloon, cutting balloon deployment, "focused force" balloon/wire combinations, or rotational atherectomy.

We report a case in which a 61 year old woman presented with chronic stable angina and severe stenoses of the right coronary (RCA), left anterior descending (LAD), and

circumflex (Cx) (arrow) arteries with a mild distal left main stenosis. After successful PCI of the RCA, the Cx was treated. The lesion in this vessel was only found to be undilatable after partial stent deployment—a potentially disastrous situation, in which a thrombogenic, unexpanded metal mesh is wedged in a stenosed vessel. Most of the therapeutic options listed above were not appropriate because of the presence of the stent. The lesion was utterly unyielding to 4 and 5 mm balloons at high pressure, but eventually responded to deployment of two simultaneous "kissing" 3 mm balloons at 22 atm, which gave the angiographic appearance of a butterfly. The patient went on to have the LAD treated at the same sitting. Abciximab was administered and she left hospital uneventfully the next day.

T Raina
J Gunn

j.gunn@sheffield.ac.uk

(A) The circumflex coronary artery of a 61 year old woman with three vessel disease was severely stenosed. The lesion was pre-dilated satisfactorily with a 2 mm balloon, so a 3.5 × 12 mm Liberté stent (Boston Scientific) was deployed. This could not be dilated with the deploying balloon, even at 20 atm pressure. Post-dilatation with 4.0 and 5.0 mm balloons to > 20 atm also failed to expand the stent. (B) Finally, a second guidewire was passed and two 3.0 mm balloons (one 15 mm long and the other 20 mm long) (Sequent, B-Braun) were inflated in "kissing" configuration to 22 atm, giving rise to the "butterfly" sign of the "undilatable" lesion. The lesion yielded just as the balloons burst. (C) Final result after post-dilatation with a 4.5 mm Gripp balloon (Acrostak) at 25 atm.