

- 12 Bjorkerud S, Bjorkerud B. Apoptosis is abundant in human atherosclerotic lesions, especially in inflammatory cells (macrophages and T cells) and may contribute to the accumulation of gruel and plaque instability. *Am J Pathol* 1996;149:367-80.
- 13 Hardwick SJ, Hegyi L, Clare K, Law NS, Carpenter KLH, Mitchinson MJ, et al. Apoptosis in human monocyte-macrophages exposed to oxidized low density lipoprotein. *J Pathol* 1996;179:294-302.
- 14 Geng YJ, Libby P. Evidence for apoptosis in advanced human atheroma. Colocalization with interleukin-1-beta converting enzyme. *Am J Pathol* 1995;147:251-66.
- 15 Davies MJ, Richardson PD, Woolf N, Katz DR, Mann J. Risk of thrombosis in human atherosclerotic plaques: role of extracellular lipid, macrophage and smooth muscle cell content. *Br Heart J* 1993;69:377-81.
- 16 Bennett M-R, Evan GI, Schwartz SM. Apoptosis of human vascular smooth muscle cells derived from normal vessels and coronary atherosclerotic plaques. *J Clin Invest* 1995;95:2266-74.
- 17 Kockx MM, De Meyer GR, Muhring J, Bult H, Bultinck J, Herman AG. Distribution of cell replication and apoptosis in atherosclerotic plaques of cholesterol-fed rabbits. *Atherosclerosis* 1996;120:115-24.
- 18 Kockx M, De Meyer G. Apoptosis in human atherosclerosis and restenosis. *Circulation* 1996;93:394-5.
- 19 Geng YJ, Muszynski M, Hansson GK, Libby P. Apoptosis of vascular smooth muscle cells induced by in vitro stimulation with interferon-gamma, tumor necrosis factor-alpha, and interleukin-1 beta. *Arterioscler Thromb Vasc Biol* 1996;16:19-27.
- 20 Gottlieb RA, Bursleson KO, Kloner RA, Babior BM, Engler RL. Reperfusion injury induces apoptosis in rabbit cardiomyocytes. *J Clin Invest* 1994;94:1621-8.
- 21 Kajstura J, Cheng W, Reiss K. Apoptotic and necrotic myocyte cell deaths are independent contributing variables of infarct size in rats. *Lab Invest* 1996;74:86-107.
- 22 Sharov VG, Sabbah HN, Shimoyama H, Goussev AV, Lesch M, Goldstein S. Evidence of cardiocyte apoptosis in myocardium of dogs with chronic heart failure. *Am J Pathol* 1996;148:141-9.
- 23 Itoh G, Tamura J, Suzuki M, Suzuki Y, Ikeda H, Koike M, et al. DNA fragmentation of human infarcted myocardial cells demonstrated by the nick end labeling method and DNA agarose gel electrophoresis. *Am J Pathol* 1995;146:1325-31.
- 24 Liu Y, Cigola E, Cheng W, Kajstura J, Olivetti G, Hintze TH, et al. Myocyte nuclear mitotic division and programmed myocyte cell death characterize the cardiac myopathy induced by rapid ventricular pacing in dogs. *Lab Invest* 1995;73:771-87.
- 25 Cheng W, Li B, Kajstura J. Stretch-induced programmed myocyte cell death. *J Clin Invest* 1995;96:2247-59.
- 26 Teiger E, Than VD, Richard L. Apoptosis in pressure overload induced heart hypertrophy in the rat. *J Clin Invest* 1996;97:2891.
- 27 Szabolcs M, Michler RE, Yang X, Aji W, Roy D, Athan E, et al. Apoptosis of cardiac myocytes during cardiac allograft rejection. Relation to induction of nitric oxide synthase. *Circulation* 1996;94:1665-73.
- 28 James TN. Normal and abnormal consequences of apoptosis in the human heart: from postnatal morphogenesis to paroxysmal arrhythmias. *Circulation* 1994;90:556-73.
- 29 Saraste A, Pulkki K, Kallajoki M, Henriksen K, Parvinen M, Viopio-Pulkki L-M. Apoptosis in human acute myocardial infarction. *Circulation* 1997;95:320-3.
- 30 Narula J, Haider N, Virmani R, DiSalvo TG, Kolodige FD, Hajjar RJ, et al. Apoptosis in myocytes in end-stage heart failure. *N Engl J Med* 1996;335:1182-92.
- 31 Yao M, Kseogh A, Spratt P, dos Remedios CG, Kiessling PC. Elevated DNase I levels in human idiopathic dilated cardiomyopathy: an indicator of apoptosis? *J Mol Cell Cardiol* 1996;28:95-101.
- 32 Mallat Z, Tedgui A, Fontaliran F, Frank R, Durigon M, Fontaine G. Evidence of apoptosis in arrhythmogenic right ventricular dysplasia. *N Engl J Med* 1996;335:1190-6.

IMAGES IN CARDIOLOGY

Tricuspid valve endocarditis

A 65 year old woman with chronic renal insufficiency who had been on venous haemodialysis for six years presented with a history of weight loss, persistent fever, chest pain, and cough lasting for several months as well as recent onset of heart failure. A loud pansystolic heart murmur was detected. Tricuspid valve endocarditis with gross tricuspid insufficiency was diagnosed by means of echocardiography. Despite broad spectrum antibiotic treatment and supportive therapy she developed septic shock and fatal multi-organ failure.

Necropsy confirmed tricuspid valve endo-

carditis, consisting of two bulky soft vegetations with smooth glistening surface, measuring 4 and 3.5 cm, attached to the anterior valve leaflet, and numerous smaller vegetations on the other leaflets (A).

Histological examination of the vegetations showed huge fungal masses, consisting of septate filaments with a 45° branching characteristic of *Aspergillus* spp (B, Grocott silver stain, ×250). The lungs displayed numerous infarcts related to arterial emboli, which contained aspergillus colonies.

L DE LEVAL
M DELEIXHE
H KULBERTUS

