REFERENCES

- 1 **Vongpatanasin W**, Brickner ME, Hillis LD, *et al*. The Eisenmenger syndrome in adults. *Ann Intern Med* 1998;**128**:745–55.
- 2 **Farber HW**, Loscalzo J. Pulmonary arterial hypertension. *N Engl J Med* 2004;**351**:1655–65.
- 3 **Wood P**. The Eisenmenger syndrome or pulmonary hypertension with reversed central shunt. *BMJ* 1958;**46**:755–62.
- 4 **Daliento L**, Somerville J, Presbitero P, *et al*. Eisenmenger syndrome. Factors relating to deterioration and death. *Eur Heart J* 1998;**19**:1845–55.
- 5 **Clozel M**. Effects of bosentan on cellular processes involved in pulmonary arterial hypertension: do they explain the long-term benefit? *Ann Med* 2003;**35**:605–13.
- 6 **Wort SJ**, Woods M, Warner TD, *et al*. Endogenously released endothelin-1 from human pulmonary artery smooth muscle promotes cellular proliferation: relevance to pathogenesis of pulmonary hypertension and vascular remodeling. *Am J Respir Cell Mol Biol* 2001;**25**:104–10.
- 7 **Allen SW**, Chatfield BA, Koppenhafer SA, *et al*. Circulating immunoreactive endothelin-1 in children with pulmonary hypertension. Association with acute hypoxic pulmonary vasoreactivity. *Am Rev Respir Dis* 1993;**148**:519–22.
- 8 **Apostolopoulou SC**, Rammos S, Kyriakides ZS, *et al*. Acute endothelin A receptor antagonism improves pulmonary and systemic haemodynamics in patients with pulmonary arterial hypertension that is primary or autoimmune and related to congenital heart disease. *Heart* 2003;**89**:1221–6.
- 9 **Channick RN**, Simonneau G, Sitbon O, *et al*. Effects of the dual endothelin-receptor antagonist bosentan in patients with pulmonary hypertension: a randomized placebo-controlled study. *Lancet* 2001;**358**:1119–23.
- 10 **Rubin LJ**, Badesch DB, Barst RJ, *et al*. Bosentan therapy for pulmonary arterial hypertension. *N Engl J Med* 2002;**346**:896–903.
- 11 **Sitbon O**, Badesch DB, Channick RN, *et al*. Effects of the dual endothelin receptor antagonist bosentan in patients with pulmonary arterial hypertension: a 1-year follow-up study. *Chest* 2003;**124**:247–54.
- 12 **Christensen DD**, McConnell ME, Book WM, *et al*. Initial experience with bosentan therapy in patients with the Eisenmenger syndrome. *Am J Cardiol* 2004;**94**:261–3.
- 13 **Schulze-Neick I**, Gilbert N, Ewert R, *et al*. Adult patients with congenital heart disease and pulmonary arterial hypertension: first open prospective multicenter study of bosentan therapy. *Am Heart J* 2005;**150**:716.
- 14 **Galie N**, Beghetti M, Gatzoulis MA, *et al*. Bosentan therapy in patients with Eisenmenger syndrome: a multicenter, double-blind, randomized, placebo-controlled study. *Circulation* 2006;**114**:48–54.
- 15 **Apostolopoulou SC**, Manginas A, Cokkinos DV, *et al*. Effect of the oral endothelin antagonist bosentan on the clinical, exercise, and haemodynamic status of patients with pulmonary arterial hypertension related to congenital heart disease. *Heart* 2005;**91**:1447–52.
- 16 **Barst RJ**, Ivy D, Dingesmanse J, *et al*. Pharmacokinetics, safety, and efficacy of bosentan in pediatric patients with pulmonary arterial hypertension. *Clin Pharmacol Ther* 2003;**73**:372–82.
- 17 **Rosenzweig EB**, Ivy DD, Widlitz A, *et al*. Effects of long-term bosentan in children with pulmonary arterial hypertension. *J Am Coll Cardiol* 2005;**46**:697–704.
- 18 **Galie N**, Hinderliter AL, Torbicki A, *et al*. Effects of the oral endothelin-receptor antagonist bosentan on echocardiographic and Doppler measures in patients with pulmonary arterial hypertension. *J Am Coll Cardiol* 2003;**41**:1380–6.
- 19 **Spindler M**, Schmidt M, Geier O, *et al*. Functional and metabolic recovery of the right ventricle during bosentan therapy in idiopathic pulmonary arterial hypertension. *J Cardiovasc Magn Reson* 2005;**7**:853–4.
- 20 **Hoepfer MM**, Markevych I, Spiekerkoetter E, *et al*. Goal-oriented treatment and combination therapy for pulmonary arterial hypertension. *Eur Respir J* 2005;**26**:858–63.
- 21 **Seyfarth HJ**, Pankau H, Hammerschmidt S, *et al*. Bosentan improves exercise tolerance and Tei index in patients with pulmonary hypertension and prostanoid therapy. *Chest* 2005;**128**:709–13.
- 22 **Hoepfer MM**, Faulenbach C, Golpon H, *et al*. Combination therapy with bosentan and sildenafil in idiopathic pulmonary arterial hypertension. *Eur Respir J* 2004;**24**:1007–10.
- 23 **Peacock A**, Naeije R, Galie N, *et al*. End points in pulmonary arterial hypertension: the way forward. *Eur Respir J* 2004;**23**:947–53.
- 24 **Shafazand S**, Goldstein MK, Doyle RL, *et al*. Health-related quality of life in patients with pulmonary arterial hypertension. *Chest* 2004;**126**:1452–9.
- 25 **Taichman DB**, Shin J, Hud L, *et al*. Health-related quality of life in patients with pulmonary arterial hypertension. *Respir Res* 2005;**6**:92.
- 26 **McKenna SP**, Doughty N, Meads DM, *et al*. The Cambridge Pulmonary Hypertension Outcome Review (CAMPOR): a measure of health-related quality of life and quality of life for patients with pulmonary hypertension. *Qual Life Res* 2006;**15**:103–15.

IMAGES IN CARDIOLOGY

doi: 10.1136/hrt.2006.094599

Loeffler endocarditis: findings on magnetic resonance imaging

An 81-year-old woman presenting with confusion and drowsiness was admitted to the intensive care unit. On admission, the patient was febrile (38°C). Laboratory analysis showed a leucocytosis of 23 000/μl, increased levels of creatin kinase and troponin values and a thrombocytopenia of 177 000/μl. Magnetic resonance imaging of the brain showed multiple ischaemic lesions. Transthoracic echocardiography showed a reduced left ventricular systolic function, with an apical hypokinesia and a suspicious apical left ventricular thrombus. Cardiac magnetic resonance imaging confirmed this suspicion. Coronary angiography showed no substantial signs of coronary artery disease or arterial occlusions. Differential white cell count showed marked hypereosinophilia, with up to 40% eosinophils of total leucocytes. Endomyocardial right ventricular biopsy specimens showed thrombotic material with eosinophilic cell infiltration. Cardiac magnetic resonance imaging showed extensive endocardial late enhancement of almost the entire left and right ventricles (see panel). On the basis of all findings, the diagnosis of Loeffler endocarditis with systemic thromboembolic events (cerebral and coronary) was made. After immunosuppressive treatment with high-dose prednisolone and intravenous anticoagulation, the clinical situation improved substantially, however, without affecting hypereosinophilia. Therefore, antiproliferative treatment with the tyrosine kinase inhibitor imatinib (Glivec) was initiated. After 4 weeks of treatment, the white cell count fell within normal range, with almost normal peripheral eosinophils.

Horizontal long axis T1-weighted gradient echo-magnetic resonance image obtained at end diastole after intravenous application of gadolinium-DTPA (diethylenetriamine penta-acetic acid) shows marked (sub-) endocardial late enhancement in both ventricles. In addition, there is thrombotic material in the left ventricular apex, with low intensity and lack of enhancement.

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