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Images in Congenital Cardiac Disease

Postoperative thrombosis in a lateral tunnel constructed to produce the Fontan circulation

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A $2\frac{1}{2}$ YEAR OLD BOY, WEIGHING 11 KILOGRAMS, with hypoplastic left heart syndrome, underwent percutaneous fenestration of the lateral tunnel constructed with a Gore-Tex conduit so as to produce the Fontan circulation. The fenestration was required because of pulmonary hypertension, occurring with persistent pleural drainage 42 days after uneventful placement of the lateral tunnel. Despite therapeutic anticoagulation postoperatively, and heparinization during the procedure, transoesophageal echocardiography showed immediate and complete occlusion of the fenestration by thrombus. This was evacuated by suction on the sheath, and alteplase was administered both locally and, for 48 hours, systemically. Initially, the clot was nearly removed in its entirety. The condition of the patient, nonetheless, deteriorated further, and repeat transoesophageal echocardiography in short (Fig. 1; LA = left atrium) and long (Fig. 2) axis views now demonstrated more than half the pathway occupied by thrombus (T). Unfortunately, the patient died, and postmortem examination was refused.

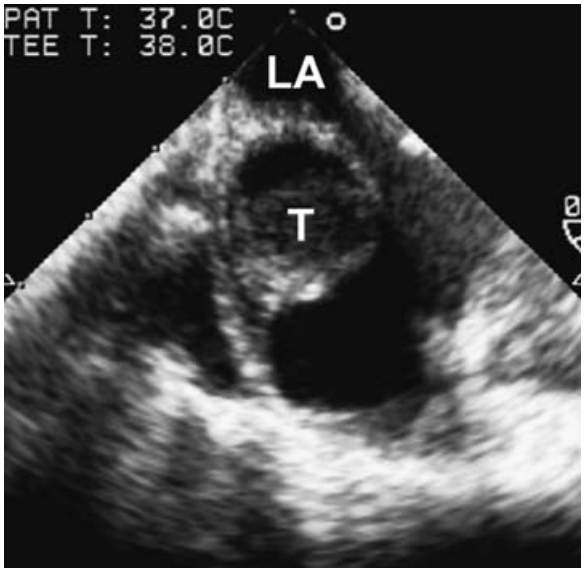

Figure 1.

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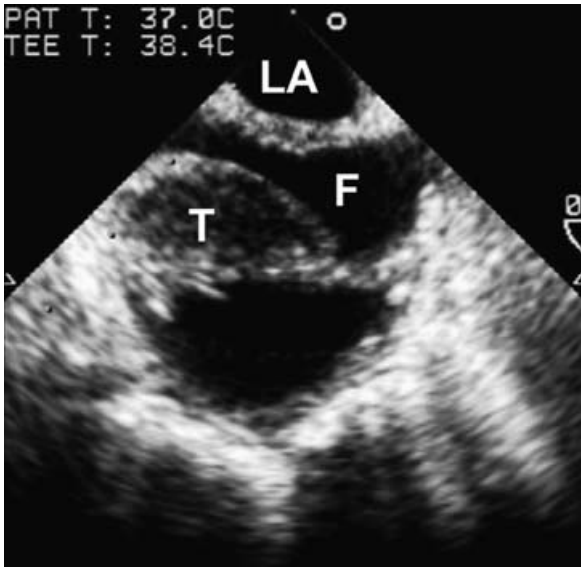

Figure 2.
F = Fontan tunnel.

Although rare, formation of thrombus in the Fontan circulation is a catastrophic complication. Why it occurred in this patient remains obscure. The postoperative haemodynamics were excellent in the early postoperative period, with central venous pressure decreasing from 20 to 14 millimetres of mercury, and there were no signs of low cardiac output. Extensive studies excluded any disorders of coagulation. Levels of all factors, in fact, were reduced, consistent with impaired hepatic function. When cardiac catheterization 21 days after surgery showed a secondary rise in pulmonary arterial pressure to 22 millimetres of mercury, high resolution chest tomography excluded pulmonary embolisation, so we assume the appearance of the clot was a local phenomenon, related in some way to manipulations to fenestrate the patch. Our patient did not respond to alteplase, followed by anticoagulation with heparin, as has been reported by others.[1]

Reference

1. Asante-Korang A, Sreeram N, McKay R, Arnold R. Thrombolysis with tissue-type plasminogen activator following cardiac surgery in children. Int J Cardiol 1992; 35: 317–322.

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