LETTERS TO THE EDITOR

Scope
Heart welcomes letters commenting on papers published in the journal in the previous six months. Topics not related to papers published earlier in the journal may be introduced as a letter: letters reporting original data may be sent for peer review.

Presentation
Letters should be:
- not more than 600 words and six references in length
- typed in double spacing (fax copies and paper copy only)
- signed by all authors

They may contain short tables or a small figure. Please send a copy of your letter on disk. Full instructions to authors appear in the July 1997 issue of Heart (page 97).

Iatrogenic atrioventricular bypass tract following a Fontan operation for tricuspid atresia

Sirs,—Rosenthal et al recently documented the presence of an atrioventricular bypass tract after a modified Fontan operation in which the right atrial appendage was anastomosed to the right ventricular outflow tract.1 Their patient developed persistent supraventricular tachycardia resulting from atrioventricular re-entry within the surgical right anastomosis, which was abolished by radiofrequency ablation. They also mentioned a previous report of atrioventricular conduction after the Fontan operation.2 Based on the evidence of these cases and other reports that document conduction across the atrio–atrial anastomosis3 the authors suggest that growth of excitable tissue across the surgical scar could be possible in patients who have undergone this type of the Fontan operation.

We have observed the de novo appearance of a pre-excitation pattern after a Fontan operation. A 16 year old woman had been diagnosed with tricuspid atresia at birth, and an atrioventricular type of Fontan anastomosis was undertaken when she was 5 years old. Twelve months after surgery the ECG pattern suddenly changed suggesting an atrioventricular bypass tract that had not been recorded previously (fig 1). Although we cannot rule out that the bypass tract was congenital in origin, it is possible that this could be a new case of conduction across the surgical scar. The direction of the initial forces of the depolarisation suggests a right anterolateral location of the bypass tract, which would be unusual in cases with absent atrioventricular connection, as in our case. In contrast with the two previously reported cases who had concealed accessory pathways, our patient had an overt pre-excitation pattern with short PR and delta wave.

Arrhythmias after Fontan operation may be related to the surgical dissection around the sinoatrial node or to a deterioration in function.4 The appearance of acquired atrioventricular conduction as in our case and others5 complicates even more the scope of postoperative arrhythmias in Fontan patients.

Atrial fibrillation and the thyroid

Sirs,—We read with interest in the editorial by Forfar6 that both clinical and subclinical hyperthyroidism are associated with the subsequent development of atrial fibrillation. The association of hypothyroidism with atrial fibrillation is less recognised.7 For example, the Canadian Registry of Atrial Fibrillation Investigators reported that 1.5% of 726 patients with atrial fibrillation had hypothyroidism over a period of 1.7 years. However, Tajiri et al reported that up to 8% of the 75 elderly patients with atrial fibrillation (mean age 75.6 years) studied were found to be hypothyroid, following a thyrotropin releasing hormone test.

We recently encountered a 61 year old man who was referred by his general practitioner with a two month history of peripheral oedema and hypertension. He was found to be in atrial fibrillation, with blood pressure of 160/100 mm Hg. There was no evidence of heart failure, and he was clinically hypothyroid. Thyroid function tests revealed a thyroid stimulating hormone (TSH) concentration of 160 mIU/l (normal range 0.4–5.5) and free T4 of 5 pmol/l (normal range 9–19) confirming hypothyroidism. Transsthoracic echocardiography showed normal left ventricular systolic function with borderline enlargement of the left atrium (4.1 cm) and the absence of left ventricular hypertrophy or pericardial effusion. After treatment with aspirin 300 mg, and thyroxine replacement for four months (dose titrated to 100 µg daily) he was found at outpatient review to be in sinus rhythm. A repeat 24 hour Holter monitor recorded a few short episodes of paroxysmal atrial fibrillation. At four months he appeared clinically euthyroid and repeat


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It seems therefore appropriate to avoid atrioventricular anastomosis in favour of lateral tunnel techniques.

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thyroid function tests showed a TSH of 20.8 mIU/L and free T4 of 15 pmol/L.

In the west Birmingham atrial fibrillation project, we reported the presence of hyperthyroidism in 16 of 213 white patients (7.5%) who were admitted to hospital with atrial fibrillation.1 No cases of thyroid disease were found among black or Asian patients. In our recent general practice survey, we found 17 cases (15.5%) of previous hyperthyroidism among 111 patients with atrial fibrillation, although only about half of the patients in the survey had thyroid function blood tests at any time.1

Although excessive chronotropic stimulation by thyroid hormones and activation of the sympathetic system may lead to the development of atrial fibrillation in thyrotoxicosis, our patient developed atrial fibrillation despite the low chronotropic “drive” with his hypothyroidism. Hypothyroidism may also be associated with cardiomyopathy or pericardial effusion, but there was no evidence for this on the echocardiogram. However, our patient was hypertensive, which may have led to a high left atrial pressure as a result of a reduced compliance in the left ventricle, although the latter is more common when left ventricular hypertrophy is present. Although our patient did not have left ventricular hypertrophy, the possibility remains that he may have had underlying coronary artery disease. This case should remind clinicians that hypothyroidism, as well as hyperthyroidism, may have had underlying coronary artery disease.

Cardiac rehabilitation: economic evaluation should be interpreted with caution

Sin,—I thank Taylor and Kirby2 for drawing attention to the cost effectiveness of cardiac rehabilitation. However, the issue should be opened to further debate.

Cardiac rehabilitation, like any therapeutic intervention, should of course be subjected to economic evaluation. However, it is not sufficient to focus on direct costs such as measures without taking into consideration issues such as health related quality of life (HRQOL).1 Indeed, in the most recent review of the Oldridge et al4 advocates of cardiac rehabilitation, the costs are presented in table 2 of this letter as the current £6000/quality adjusted life year gained for cardiac rehabilitation may be expected to triple.

Furthermore, it may be argued that too much attention has been paid to rate of survival (although obviously important) following cardiac rehabilitation, when improved HRQOL is the expected main benefit.5 This is likely to create potentially misleading data and obviously does not allow a well informed economic judgment.

In economic analysis, additional costs may have to be included.6 With respect to cardiac rehabilitation, additional costs such as exercise clothing and shoes are likely to be minimal; however, indirect costs such as loss of wages for time spent in rehabilitation could be considerable. Considering that return to work is a favourable outcome measure following myocardial infarction or coronary artery bypass grafting, the economic implications of rehabilitation stalling return to the workplace are considerable. Of course, cardiac rehabilitation may also hasten return to work.

Finally, there remains the difficult question of accurate economic analysis of an intervention that as yet is not fully defined. The authors acknowledge that the term “comprehensive cardiac rehabilitation” is rendered imprecise by the differences between individual programmes. Thompson and Bowman3 in the most recent review of the effectiveness of cardiac rehabilitation recommended that further work be done to evaluate the most appropriate means of delivering cardiac rehabilitation. Therefore, until consensus is achieved as to what comprehensive cardiac rehabilitation actually entails, economic data should be interpreted with caution and be used to guide decision making, rather than be the absolute basis for decision making with respect to a cardiac rehabilitation service.


This letter was shown to the authors, who reply as follows:

Sin,—We thank Grant for his comments, which raise important questions about economic evaluation. We agree that the idea of economic evaluation of cardiovascular interventions should aim to take account of HRQOL measures and, moreover, undertake cost-utility analysis such as cost per quality adjusted life year as presented in table 2 of our paper; but it is equally important to bear in mind that there are methodological problems in doing so.7 The evidence supporting the statement that “HRQOL is the expected main benefit” of cardiac rehabilitation at present remains limited, as recently highlighted in a review by Oldridge.8

The issue of the indirect costs (as the result of work non-attendance) associated with attending a cardiac rehabilitation programme is an interesting one. To address this we revisited the data of Levin et al9 discussed in our editorial, and calculated the costs that would be incurred as the result of loss of work. Assuming patients attended 36 sessions (three sessions per week for three months) of three hours per session of outpatient cardiac rehabilitation, the average indirect cost would be approximately £1300 per patient (in 1994–95 prices). From a societal perspective, this indirect cost would offset by the −15% savings gained by the health service over five years following cardiac rehabilitation.

Finally, as we emphasised in our conclusions, this editorial is based on a synthesis of a relatively small evidence base. Moreover, there is an urgent need for further research, including formal evaluation of the relative cost effectiveness of the various elements of so called comprehensive cardiac rehabilitation.


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Heart 1997 78: 623
doi: 10.1136/hrt.78.6.623

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