Echocardiographic identification of aorta and main pulmonary artery in complete transposition

Sir,

A. B. Houston and his colleagues have shown two-dimensional echocardiographic findings on the spatial relation between the great arteries (*British Heart Journal* (1978), 40, 377). We have applied a similar procedure routinely to our complicated heart anomalies and defined 3 transverse planes as follows (Satomi *et al.*, 1978).

Plane 1 is where the echo of the semilunar valve of the posterior great artery is obtained. Plane 2 is slightly more cephalad in direction, where the echo of the semilunar valve of the anterior great artery is seen. Plane 3 is more cephalad still, where neither semilunar valve is seen.

When the interrelation of the great arteries is spiral, an anteriorly positioned artery at plane 1 runs beside and behind the other artery and the posterior wall echo of the anterior artery extends posteriorly at plane 3 (Fig. 1a). When parallel, its parallel interrelation of the echo images from the great arteries is maintained in the 3 transverse planes or the posterior wall echo of the posterior great artery may extend posteriorly, or give off a branching image (Fig. 1b).

The artery showing the posterior extension or branching is the pulmonary artery which is confirmed by contrast two-dimensional echocardiogram (Fig. 2), though it has not been illustrated by Houston *et al.*

We have made correct anatomical diagnoses not only in many cases of complete transposition but also in those with double outlet right ventricle or corrected transposition of the great arteries showing parallel interrelation. This procedure has been very useful in the diagnosis of congenital heart disease as Dr Houston and his colleagues have commented.

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Reference

Satomi, G., Shimizu, K., Komatsu, Y., and Takao, A. (1978). Two dimensional echocardiographic diagnosis of congenital heart disease. Part 1: Spatial interrelationship between the great arteries. *Journal of Cardiology*, in the press.

This letter was shown to Dr Houston and his co-authors who reply as follows:

Sir,

We agree with Dr Satomi's comments.

In patients with parallel great arteries the 3 scanning planes he describes correspond to the manoeuvre we use to attempt to demonstrate branching of the main pulmonary artery described in the discussion as 'tilting or edging the scanning plane upwards'. In an earlier study of older patients with transposition (Houston *et al.*, 1977) we reported that it was not always possible to see both semilunar valves in a single scanning plane. We have subsequently found that with the more oblique high transverse plane, both valves are occasionally not recorded simultaneously in subjects with normally (spirally) related great arteries. In our studies of patients with other great artery anomalies we have found that in all infants the longitudinal view allows the great arteries to be rapidly identified while it is not always possible to identify clearly the bifurcation of the pulmonary artery. The posterior extension of the pulmonary artery described by Dr Satomi and shown in our Fig. 2 represents the posterior turn of the pulmonary artery at a lower level than the aorta which still appears as an approximately circular echo-free space.

A. B. Houston,
N. L. Gregory, and
E. N. Coleman,
Royal Hospital for Sick Children,
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Reference

Houston, A. B., Gregory, N. L., and Coleman, E. N. (1977). Two-dimensional sector scanner echocardiography in cyanotic congenital heart disease. *British Heart Journal*, 39, 1076-1081.

Fig. 1

Fig. 2