Advanced Technology: Clinical Blessing or Clinical Blinders?

To the Editor:

In their article “Occult anomalous pulmonary venous drainage: the clinical value of cardiac magnetic resonance imaging,” Dr Tan and colleagues present elegant magnetic resonance images from a patient with total anomalous right pulmonary venous drainage into the inferior vena cava (Scimitar syndrome). Their article demonstrates the superb graphic capability of MRI and also provides evidence of the hemodynamic or functional value of magnetic resonance flow mapping in quantitating the magnitude of a left-to-right shunt.

The authors’ addition of “occult” to their title, however, implies that high-tech MRI was critical to the diagnosis. I question the occult nature of this anomaly. Given that the ratio of pulmonary blood to systolic blood flow was 2.7:1, one would anticipate highly suggestive bedside findings such as a palpable lift over the right ventricle, a pulmonary ejection murmur, a persistently split second sound, and even a tricuspid inflow rumble. The contrast-enhanced magnetic resonance pulmonary venous angiogram (Figure 3 in Tan et al) suggests that this “scimitar” might even have been visible on plain chest radiography. Further, transthoracic and transesophageal echocardiography, which were performed before MRI, seem to have replaced, rather than augmented, the physical examination.

At right-heart catheterization, a left-to-right shunt was identified at the right atrial level. The careful collection of a series of blood samples to document oxygen saturation from the superior vena cava to the inferior vena cava would have pinpointed the location of the shunt to the high inferior vena cava. Moreover, manipulation of the catheter would have permitted entry into the common vein draining the right upper and lower pulmonary veins. There, an injection of contrast medium would have illuminated the “occult.”

Undeniably, MRI and other technical advances of the recent past have added immeasurably to our diagnostic and therapeutic acumen. It is not correct, however, to create the impression that MRI was, in this case, required to bring light out of darkness. The proper performance of a right-heart catheterization is important in the diagnosis of left-to-right shunt caused by anomalous venous drainage. We used the word “occult” in our report to describe an interesting case of a patient with anomalous pulmonary venous drainage diagnosed first on MRI, who had escaped diagnosis despite full clinical evaluation and several prior tests. Dr Hall enumerated several physical signs associated with atrial septal defect with significant intracardiac shunt. Though useful, these signs alone would not have been adequate for the exact anatomic diagnosis. Although a “scimitar” appearance on chest roentgenogram may suggest the diagnosis, the need for further functional work-up of the lesion remains. Right-heart catheterization alone might have yielded the diagnosis and enabled visualization of the anomalous vein (provided it was successfully cannulated), but in this case the anatomy was not clearly appreciated. The choice of the most optimal and cost-efficient diagnostic test would depend on the availability of expertise and equipment. Cardiovascular magnetic resonance imaging is not widely available, but the technique should be considered, if available, in the work-up of a patient suspected of having anomalous venous drainage.

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Response

We agree with Dr Hall that a good bedside clinical examination, chest x-ray, echocardiography, proper right-heart catheterization, and sampling for oxygen saturation are all important in the diagnosis of left-to-right shunt caused by anomalous venous drainage. We used the word “occult” in our report to describe an interesting case of a patient with anomalous pulmonary venous drainage diagnosed first on MRI, who had escaped diagnosis despite full clinical evaluation and several prior tests. Dr Hall enumerated several physical signs associated with atrial septal defect with significant intracardiac shunt. Though useful, these signs alone would not have been adequate for the exact anatomic diagnosis. Although a “scimitar” appearance on chest roentgenogram may suggest the diagnosis, the need for further functional work-up of the lesion remains. Right-heart catheterization alone might have yielded the diagnosis and enabled visualization of the anomalous vein (provided it was successfully cannulated), but in this case the anatomy was not clearly appreciated. The choice of the most optimal and cost-efficient diagnostic test would depend on the availability of expertise and equipment. Cardiovascular magnetic resonance imaging is not widely available, but the technique should be considered, if available, in the work-up of a patient suspected of having anomalous venous drainage.

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