Subxiphoid M-Mode Echocardiography in Atrioventricular Defects

Alfonso Medina Fernandez Aceytuno, Armando Bethencourt Gonzalez, Carlos Macaya Miguel, Michael Tynan, Robert H. Anderson

Departamento Medicina Interna, Seccion Hemodinamica, Residencia Nuestra Segnora del Pino, Las Palmas (Islas Canarias); Department of Paediatrics, Guy’s Hospital, London, England; and Cardiothoracic Institute, Brompton Hospital, London, England

SUMMARY. M-mode echocardiograms obtained using the subxiphoid position of the transducer were compared with those obtained using the parasternal position in 21 children with atrioventricular defects. In the 16 children with complete atrioventricular defect, it was always possible to demonstrate a common valve orifice wholly occupying the space between the anterior and posterior cardiac walls with no interventricular septal tissue in the plane of the orifice. Scanning between the plane of this orifice and the ventricular cavity demonstrated a ventricular septum in all cases, separating components of the atrioventricular valve apparatus from each other, corroborating the impression that the valve was straddling the ventricular septum and, therefore, that the valve was common to both ventricles. No septal tissue was detected in scans ranging between the aortic valve and the common orifice in these 16 children. In the five children with partial atrioventricular defects, two atrioventricular orifices separated by septum could be demonstrated. The subxiphoid approach in these 21 children defined the anatomy of atrioventricular defects more clearly and more readily than the parasternal approach.

KEY WORDS: Echocardiography — M-mode echocardiography — Subxiphoid position — Atrioventricular defects

It is now well established that two-dimensional echocardiography permits the diagnosis of complete atrioventricular defects [2, 3, 7]. However, not all centers possess or can afford the necessary equipment. M-mode echocardiography using the anterior chest wall approach can lead to the suspicion that a complete defect is present [1, 10, 14], but the information is not always diagnostic and is difficult to obtain [7]. It seemed to us that using a different “angle of attack” on the area of interest might provide additional information. The subxiphoid approach is widely used in adult patients [5], for example, those with emphysema, but is rarely employed in children [8]. It has recently been advocated for the study of atrioventricular defects [12]. Using this approach, we studied a series of patients with atrioventricular defects, and our experience confirms its value.

Echocardiographic Anatomy of Atrioventricular Defects

In atrioventricular defect the septum has a characteristic “scooped-out” appearance (Fig. 1) that is found irrespective of the morphological characteristics of the atrioventricular valves [6, 9, 13]. Associated with this is relative shortening of the inlet portion of the ventricular septum. The characteristic of the complete type of atrioventricular defect is that the atrioventricular junction is guarded by a single atrioventricular valve that has an annulus common to both atria and both ventricles. Typically there is a large confluent atrioventricular defect through which all four cardiac chambers are in free communication. There is variability in the morphol-
Fig. 1. The characteristic left ventricular aspect of the septal morphology in atrioventricular defects. Figure 1A shows the morphology of the partial type, with the bridging leaflets fused both to each other and to the crest of the ventricular septum. Figure 1B shows the morphology of the complete form, with the bridging leaflets "floating" in the junctional defect, dividing it into three components (see text).