Letters to the Editor

Letters to the Editor will be published, if suitable, and as space permits. They should not exceed 500 words in length, and may be subjected to editing or abridgement.

Straddling and Displaced Atrioventricular Orifices and Valves

To the Editor:

Among the unusual forms of congenital cardiac disease are (1) the entities of single ventricle and (2) the rare situation in which the tricuspid valve (communicating with the right atrium) joins either the left ventricle alone ("displaced tricuspid valve") or both ventricles ("straddling tricuspid valve"). The subjects of displaced or straddling tricuspid valve occupy the main body of a report by Dr. Liberthson and associates (Circulation 43:213, 1971).

According to the author, while single ventricle and the other two conditions are quite different entities from an anatomic viewpoint, they are closely related developmentally, an opinion which I wish to emphasize. The relationship is supported by a consideration of the highlights of the development of the ventricles of the four-chambered heart. In the primitive heart, the common atrium is joined to the common ventricle by the common atrioventricular canal. Normally, the latter gives rise to the mitral and tricuspid valves.

Development of two ventricles depends upon a focus of growth in the wall of the primitive ventricle, from which the right ventricle is molded, while the tissue intervening between the new chamber (the right ventricle) and the primitive chamber (which remains as the left ventricle) becomes the muscular part of the ventricular septum. As the primitive ventricle becomes the left ventricle, it is apparent that originally the primordia of the atrioventricular valves lie over the structure to be the left ventricle. The definitive stage, wherein the tricuspid valve lies over the right ventricle, is achieved by a shift toward the right of the maturing atrioventricular canal.

In the cases reported, the connection of the tricuspid valve with the left ventricle, either partially or totally, is explained by an arrest in development, characterized by failure of the full shift toward the right of the atrioventricular canal. In most of the cases reported, the arrest in development also affects the right ventricle since, although a sinus portion is present, this chamber is rudimentary.

A more primitive stage in arrested development yields the characteristics of the single ventricle wherein both atrioventricular valves join the main body of the single ventricle, the latter to be viewed as representing the primitive ventricle. The infundibulum of the single ventricle may be viewed, as did De La Cruz and Miller as well as Liberthson and associates, as arrested development in the differentiation of the right ventricle from the primitive ventricle.

While displaced or straddling tricuspid valve (the latter condition designated by some as double-inlet left ventricle) and single ventricle may be viewed as closely related developmentally, yet another condition reported by Liberthson and associates is difficult to understand at this time. This is the situation wherein the mitral valve joins the right ventricle while the tricuspid valve joins the left ventricle. Regardless of the lack of adequate explanation for the latter condition, at this time, the report of Liberthson and associates represents a distinct contribution to the literature on congenital heart disease. Not only does it clearly present complicated cardiac malformations, but even more important is its bringing together grossly different conditions as closely related developmentally.

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Isoproterenol and Pulmonary Circulation

To the Editor:

Dr. Ferrer and her associates have demonstrated in their paper (Circulation 43: 528, 1971) the vasodilating effects of isoproterenol on the pulmonary vascular bed in a group of 14 patients with chronic obstructive disease. During isoproterenol infusion a consistent increase in both heart rate and cardiac output was observed. In most patients there was a substantial increase in pulmonary blood volume (PBV) associated with an insignificant change in pulmonary vascular...