

## Editorial

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# Surgical treatment of congenital lesions of the mitral valve

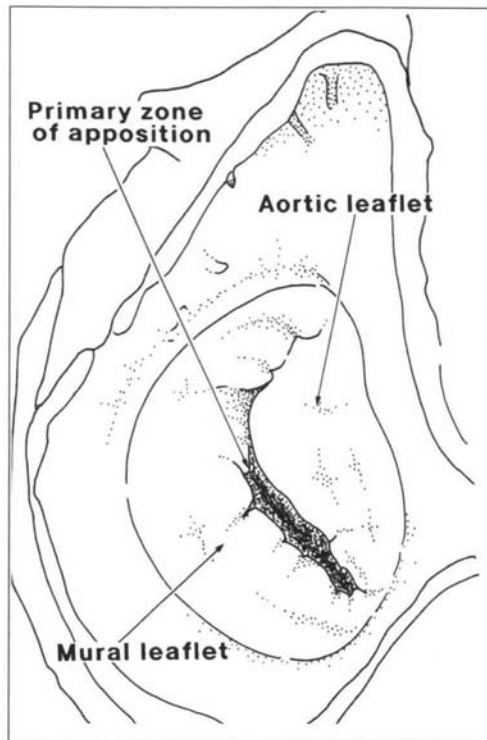
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IN THIS ISSUE OF THE JOURNAL, WE CONCLUDE our review of treatment of congenital lesions of the atrioventricular valves by giving details of the results of the team from l'Hôpital Broussais for mitral valvar stenosis and insufficiency.<sup>1,2</sup> In a previous issue, we presented their innovative approach to repair of patients with Ebstein's malformation.<sup>3</sup> As with the earlier discussion, the results described for analysis and treatment of anomalies of the mitral valve provide food for thought for all those involved with cardiology in the young. As Chauvaud and his colleagues repeatedly stress, results of surgical treatment need to be based upon functional rather than purely anatomical analysis of the abnormal valves. As primarily an anatomist, it comes as somewhat of a jar for me to read that "systems of classification based on anatomic analysis are not always entirely appropriate". But when one studies the enlightened classification of Carpentier, based primarily on the motion of the leaflets and then coupled with anatomic observations,<sup>4,5</sup> the reality of the advocated approach is obvious. Indeed, such a functional approach should be extended to analysis of the *normal* mitral valve.

The description of the normal mitral valve, in particular the number of leaflets it contains, remains controversial.<sup>6-8</sup> This is, in part, because morphologists seeking to classify the valve tend to analyse it in open position, and do not take cognizance of the motion of the leaflets. If they did so, and viewed the valve in its closed position, which is the view obtained by the surgeon when assessing the repair, they would appreciate that the skirt of leaflet tissue guarding the valvar orifice closes along only one primary zone of apposition (Figure 1). This zone of apposition divides the skirt into a deep leaflet guarding about one-third of the overall circumference and a shallower but more extensive leaflet guarding two-thirds of the orifice. There is debate as how best to name these leaflets,

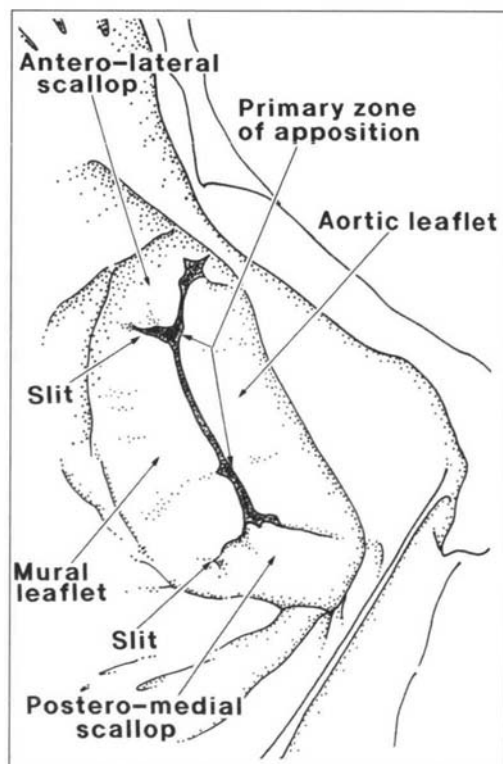
but 'aortic' and 'mural' are the most accurate adjectives in terms of anatomy and position. As Victor and Nayak pointed out in a perceptive review,<sup>8</sup> the mural leaflet then needs several slits, or incisures, along its length to permit it snugly to coapt against the aortic leaflet (Figure 2). Victor and Nayak likened this process to the need to provide pleats in a full skirt so as to let it properly fall and lie during wear.

The problems that exist in attempting to define the number of leaflets within the valve appear only when the valve is seen in its opened position, the view favoured by the pathologist. It is then beyond question that there are multiple deficiencies within the overall skirt of leaflet tissue, variably supported by the tendinous cords attaching the leaflets to the papillary muscles.<sup>9</sup> The individual variation found from patient to patient, however, makes it exceedingly difficult to provide a reliable means of distinction of leaflets on this basis. At any rate, it is also the case that definition of one variable morphologic feature using another variable as the defining criterion contravenes a fundamental rule of cardiac anatomy (the morphologic method - structures should be defined on the basis of their most constant component<sup>10</sup>). The constant arrangement of the mitral valve is seen with the leaflets in their closed position - one primary zone of coaptation between them (Figures 1 & 2). It is then moot as to whether this entire zone warrants description as the solitary valvar commissure (the logical approach), or whether the ends of the zone are best described as paired antero-lateral and postero-medial commissures (the conventional approach). This problem can be circumvented neatly and simply by describing the zone of apposition as precisely that.<sup>11</sup> Those who are interested in mitral valvar morphology from all aspects will have met in 1996 over the course of the fall to try to reach an agreement on how best to describe the valve. Alain Carpentier will be amongst those who will meet. One hopes that he will try to persuade those present of the validity of the functional approach which, as demonstrated in the papers



**Figure 1**

*This heart was fixed so as to preserve the systolic arrangement of the leaflets of the mitral valve. As can be seen, there is one, slightly concave, zone of apposition between the aortic ("anterior") and mural ("posterior") leaflets of the valve.*



**Figure 2**

*This mitral valve, fixed in identical fashion to the one shown in Fig. 1, shows a frequent anatomic variant. In addition to the solitary primary zone of apposition between aortic and mural leaflets, there are two prominent slits at right angles to the primary zone. These demarcate the so-called "scallops", or commissural leaflets. The number of slits, however, varies from heart to heart. Only the presence of the solitary primary zone of apposition is a constant.*

which follow, is so crucial in determining the optimal options for surgical repair of the congenitally malformed valve. Such a functional approach, when applied to the normal valve, shows that it has two major leaflets, one aortic and one mural, with a solitary zone of apposition between them.

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