Abnormal right heart filling after cardiac surgery

SIR,—Dr Wranne and colleagues demonstrated in figure 5 of their interesting study that the lateral aspects of the tricuspid annulus showed a more pronounced motion loss after cardiac surgery than those of the mitral annulus. As one of the possible explanations they suggested that the left ventricle was better preserved during surgery than the right ventricle. This theory is confirmed by an experimental study of the tissue electrolyte content in the right and left ventricular myocardium after normothermic open heart surgery in dogs. Cardiac arrest had been induced (a) by clamping the ascending aorta, (b) by aortic clamping with additional injection of a cardioplegic solution, (c) and by electrically induced fibrillation (with preservation of the coronary circulation). Tissue electrolyte content was determined before extracorporeal circulation was started, as well as after an hour of recovery from a cardiac arrest of 30 or 45 minutes. In all these forms of cardiac arrest, tissue water had increased and potassium and magnesium decreased. These changes were more pronounced in the myocardium of the right ventricle in all experimental groups. A decrease in potassium and magnesium content in tissue is an indicator of cellular injury.1,2

In the study in dogs the loss of these electrolytes was more pronounced in the myocardium of dogs with low cardiac output that in those with adequate circulation after cardiac arrest. Because the dogs did not have genuine cardiac surgery cardiac arrest was relatively short and hypothermia was not used. Hence we do not believe that the observed differences between the ventricles were predominantly caused by a mechanical impediment, more pronounced exposure of the right ventricle to room temperature, or heat radiation from the operating room lights, as suggested by Wranne et al. We attribute this phenomenon to a proposed difference in the susceptibility of the right and left ventricular myocardium to systemic disturbances, as it has been described for various diseases, such as hyperosmolar coma or liver failure.1,4-6 Histologically, ultrastructurally, and biochemically, the right ventricular myocardium differs from that of the left ventricle.4 According to Doerr the different susceptibility of the ventricles to disease can be explained by phylogenesis: the right ventricle is more remote from the tricuspid valve, which acts as a primum movens to the left ventricular myocardium.5 Perhaps this so-called "theory of pathologists" also explains the differences between the right and left ventricular function seen after cardiac surgery and described by KONRADIN METZE.

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When the original edition of this comprehensive textbook appeared, I was given the opportunity to review it in 1980. It was the first of a new generation of such works, and set the standards by which others might be judged. Not only did other important similar works respond by improving their quality but a number of other textbooks have appeared, mainly in the United States though with one British based offering. As with previous editions, Braunwald is an author or co-author of many of the chapters as well as having orchestrated the whole. He has taken considerable trouble to ensure that what appears is up to date even at the cost of shedding some earlier references from some chapters that may be of historical relevance. But as his purpose is to present contemporary evidence, this has enabled him to limit the size to some extent. Nevertheless, there are still 1874 pages of text and illustrations, with ample and appropriate references. The whole of the subject is covered extensively and if some miss their favourite topics, that will be highly exceptional. For a description of pathological processes generally one will have to turn elsewhere and this is probably appropriate in a book aimed at providing clinically relevant information, yet readers should not forget the potential importance of such authorship.

There have been modest changes in authorship since the third and fourth editions, and Braunwald's system of having all the chapters externally reviewed ensures a high standard throughout. The most striking feature of the present edition is the lavish use of colour. Generally this is helpful and indeed to have the chapters numbered red discriminates them from the pages above and makes for the easier finding of what one needs from an index that did not fail several random tests. Those interested in electrocardiography will, however, question the use of considerably more than 3000 tracings and a dark but absolutely crisp background for the grids (the latter is an excellent feature); surely it would have been easier for most enthusiasts to have the observed and the tracings had been dark and the background coloured as you see in clinical tracings. In other respects I accept, and on the whole welcome, the use of colour, which
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