results similar to those observed by radioassay. It seems to be a useful addition to the diagnostic tests on pleural fluid.


The intra-aortic balloon pump

The principle of the intra-aortic balloon pump is simple enough. A catheter with a sausage-shaped balloon is passed through a femoral artery to the descending aorta. The balloon is rapidly inflated during diastole, thus raising the pressure with which the coronary arteries are perfused and so increasing coronary blood flow and myocardial oxygenation. The balloon is suddenly deflated immediately before systole, so reducing the cardiac afterload, increasing the stroke volume and ejection fraction, and decreasing the tension in the myocardial wall and myocardial oxygen consumption.1 2 Balloon pumping has been shown to improve the haemodynamic performance in a wide variety of conditions in which cardiac function is impaired.3-8

Unfortunately, the practice of balloon pumping (or counterpulsation) is not so simple. The standard catheter has to be inserted through a side arm sewn into the femoral artery by a vascular surgeon—a time-consuming procedure which inevitably stresses a patient who is possibly already critically ill. Complications are common8 and include dissection of the aorta or of one of its branches, perforation of a major artery, thrombosis, embolism, and infection. Most of these complications seem to occur at the time of insertion of the catheter, and they may become less frequent with the newer catheters that can be inserted percutaneously. The technique was introduced with general acclaim a decade ago and in some parts of the world it has been used extensively, but its value remains uncertain: Balloon pumping is certainly useful after cardiac surgery in cases when it proves difficult to take the patient off the cardiopulmonary bypass, when a limited period of pumping may allow the myocardium to recover from the operation. Preoperative pumping may also be useful, to maintain the patient and his heart in the best possible shape while preparations for surgery are being made.9,10

The main debate, however, is the place of the balloon pump in emergencies not connected with cardiac surgery, and in particular in patients with severe myocardial infarction.

A recent paper from Rotterdam11 has described experience in 181 patients treated by balloon pumping for the complications of myocardial infarction or of unstable angina. Seventy-one patients had cardiogenic shock, defined clinically as a low blood pressure, a cool periphery, mental dullness, basal lung crepitations, and a urinary output of less than 40 ml/h, the patient already being treated with digitalis, diuretics, dopamine, and vasodilators. Patients in this state would be expected to have a high mortality, yet about half survived three months or more. Forty-two further patients with angina at rest that was refractory to medical treatment were treated with the balloon pump, and in 41 relief of pain was rapid and surgery was performed later with a low complication rate.

So should all coronary care units be equipped with balloon pumps? Enthusiasts have claimed that only with such techniques can mortality rates after myocardial infarction be kept really low.12 Yet though the data from Rotterdam are impressive they do not really answer this question: the patients with cardiogenic shock who seemed to benefit most were those aged under 60, who had not had a previous myocardial infarction, and who were treated with the pump within six hours of the onset of symptoms. No district general hospital is going to see many patients with cardiogenic shock who fit this description, while such patients probably neither could nor should be immediately transferred to regional centres specially for pump treatment. The conservative physician might argue that such patients are precisely those most likely to improve with relief of their pain and minimal interference: the widespread and indiscriminate use of balloon pumping might well lead to more complications than clinical benefit.