Title : EFFECT OF THE PERICARDIUM ON VENTRICULAR FUNCTION IN MAN

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Introduction: Several studies in animals indicate that the pericardium influences ventricular diastolic and systolic function, especially at elevated filling pressures. The applicability of results from these studies to man is not known. Opportunities to measure the influence of the pericardium in man are relatively rare. Patients undergoing cardiac surgery present uniquely in this regard for they undergo pericardiotomy prior to cardiopulmonary bypass. In this study, we investigated the effects of the pericardium on right and left ventricular function curves and on right and left ventricular pressure coupling over a range of normal and moderately elevated filling pressures.

Methods: Twenty patients admitted for coronary artery surgery were studied (with approval of the Human Research Committee, UCSF). Anesthesia consisted of morphine sulfate (1 to 1.5 mg/kg I.V.) and diazepam (0.25 to 0.50 mg/kg I.V.). Pancuronium (0.05 to 0.15 mg/kg I.V.) provided muscle relaxation, and ventilation (with 100 percent oxygen) was controlled. Hemodynamics were monitored via radial artery and thermodilution pulmonary artery catheters. Immediately prior to pericardiotomy, surgery was stopped, and hemodynamic equilibrium established. Measurements were made at end-expiration: (1) with the patient supine, (2) with lower extremities elevated to a 45 degree position (relative to the chest), and (3) with elevation to 90 degrees. The pericardium was then incised, sutured laterally, and the heart fully exposed. The above measurements were repeated.

Results: Right and left ventricular function curves and pressure-coupling curves were generated before and after pericardiotomy, and compared for each patient. The results for five typical patients (numbered 10, 13, 14, 19, and 20) are shown in the Figures. Paired-sample t-testing and analysis of variance revealed no significant difference ($p>.05$) between these curves in any patient. These results were found over both the normal and moderately abnormal ($CVP \leq 16$, $PCW \leq 21$mmHg) ranges of filling pressures, and in patients with preexisting elevation of PCW and CVP pressures.

Discussion: In man, the pericardium does not influence right or left systolic function or the coupling relationship between the right and left ventricles when filling pressures are normal or moderately elevated. Hemodynamic measurements made in one ventricle will not be altered by changes occurring in the other ventricle reflected via the pericardium. Thus, changes occurring in cardiac performance following pericardiotomy, should be attributed to alterations in the ventricular muscle itself and not to the influence of the pericardium. Finally, these results do not suggest an advantage to closing the pericardium following myocardial revascularization.

———Pre-Pericardiotomy
------Post-Pericardiotomy