

## Proceedings of the Thoracic Society

The Spring Meeting of the Thoracic Society was held on 3–4 March 1972 at the Royal College of Physicians, London. There were seven short papers, one review, and four symposia. Summaries follow.

### SURGICAL ASPECTS OF BACTERIAL ENDOCARDITIS

T. A. H. ENGLISH and J. K. ROSS Survival in patients with bacterial endocarditis has improved greatly since the introduction of antibiotics. The nature of the disease and indications for operative treatment have also changed.

Forty patients with a previous history of bacterial endocarditis were treated surgically. Thirty-five were male and five female. Their ages ranged between 12 and 68 years, with a maximal incidence in the fourth, fifth, and sixth decades.

Twenty-seven patients were operated on electively at varying intervals after completion of antibiotic therapy. One patient had an isolated mitral valve replacement and 26 had aortic valve replacements. Of these 26, 10 also required either repair (4) or replacement (6) of the mitral valve, and three others had closure of a ventricular septal defect secondary to the infective process. There were four deaths (mortality 15%).

Seven patients underwent emergency operation for intractable heart failure before completion of antibiotic treatment. The interval between initiation of chemotherapy and surgery varied between 6 and 42 (mean = 20) days. Six of the seven survived operation and there was one late death (mortality 29%).

Six patients had infections on pre-existing cardiac prostheses. Three required emergency surgery. One patient with a large mycotic aneurysm of the aortic root died at operation. Another died five days after replacement of an infected aortic homograft valve by a Starr-Edwards prosthesis. The other four survived (mortality 33%). These included one patient who had triple valve replacement of aortic, mitral, and tricuspid prostheses affected by fungal endocarditis. There were no late infections.

Endocarditis on cardiac prostheses is difficult to cure and reports of successful cases are rare. Our results indicate that surgical treatment has an important role both in the management of intractable heart failure consequent on bacterial endocarditis and in the eradication of infection. The timing of operation is crucial, particularly where valve destruction occurs early, and in this event operation may be necessary before completion of antibiotic therapy.

### SMALL AIRWAY CLOSURE IN LEFT HEART FAILURE

J. V. COLLINS, T. J. H. CLARK, and S. MCHARDY-YOUNG Closing volume (CV) is defined as that lung volume at which airway closure begins during expiration. The

technique for its measurement involves a maximal inhalation of a marker gas from residual volume (RV) followed by a slow expiration back to RV. During expiration the concentration of marker gas at the mouth and the expired volume are recorded. A characteristic trace shows an alveolar plateau (phase 3) followed by a rise in concentration of marker gas (phase 4) at low lung volume. The junction of phases 3 and 4 is thought to represent the lung volume at which airway closure begins and has been shown to be gravity dependent; in practice, phase 4 is measured from the trace as a volume and added to RV measured by another method to give closing volume. Using Xenon-133 as a marker gas, we have measured closing volume in normal subjects and in patients with disease predominantly affecting the left heart.

In normal subjects we have found that CV/TLC shows a linear increase with age and is a reproducible measurement. In patients with left heart failure and without evidence of airways obstruction by conventional spirometric testing (FER > 70%) the CV/TLC has been found to be increased; this increase in CV consists of an increase in both phase 4 and RV and remains gravity dependent.

Following administration of Salbutamol by aerosol the closing volume has fallen in the majority of patients towards a normal value for age. In some of these patients there has been a comparable reduction in CV following inhalation of atropine by aerosol, and subsequent inhalation of Salbutamol has had no additional effect. There has been no reduction in the size of CV in normal subjects following the inhalation of either  $\beta$ -adrenergic or atropine aerosols.

These results suggest that some of the mechanical abnormality of the lungs found in patients with left heart failure may resemble those observed in mild bronchial asthma, affecting predominantly peripheral airways of small calibre.

### EFFECTS OF FRUSEMIDE ON GAS EXCHANGE IN LEFT VENTRICULAR FAILURE

A. E. TATTERSFIELD Patients with left ventricular failure have interstitial and alveolar oedema of the lung which causes ventilation-blood flow mismatching and results in hypoxaemia and increase in the dead space-tidal volume ratio and venous admixture. We have studied the effect of an acute diuresis induced by 80 mg of frusemide on gas exchange in patients with myocardial infarction and left ventricular failure. Stable and reproducible blood gas and cardiac output