BRIEFS FROM THE LITERATURE

JOHN W. PENDER, M.D., *Editor*

Briefs were submitted by Drs. John Adriani, Norman A. Bergman, Peter P. Bosomworth, M. T. Clarke, J. E. Eckenhoff, Martin Helrich, J. R. Householder, J. J. Jacoby, S. J. Martin, S. R. Oechs, R. E. Ponath, William Rabenn, Alan D. Randall, Lawrence Reichmann, Clarence Serfling. Briefs appearing elsewhere in this issue are a part of this column.

PULMONARY BLOOD FLOW Positive pressure inflation of human and canine lungs diminishes pulmonary blood flow in preparations perfused with their own blood. The increasing resistance to flow is explained on the basis of capillary compression. If the lungs are encased and inflated by applying negative intrapleural pressure, pulmonary blood flow increases. Maximal flow occurs with negative pressures of 10–20 cm. of water. A further increase of the negative pressure causes a decline of pulmonary perfusion which is thought to be related to capillary collapse. If the trachea is occluded and negative pressure applied to the surface of the lungs, pulmonary blood flow continues to rise. (*Müller, A., and Debrunner, W.: Pleuraler Sog und endotrachealer Druck im Vergleich zur Lungendurchblutung, Der Anesthetist 9: 344 (Nov.) 1960.*)

PULMONARY HYPERTENSION An evaluation was made of the effect of increasing negative intrapleural pressure with suction catheters in the closed chest on pulmonary artery pressure in dogs following 50 to 85 per cent pneumonectomy. A determination was made of the effect of distention of the lung on pulmonary vascular resistance. Fifteen mongrel dogs were subjected to 50 to 85 per cent resection of the total lung capacity and their chests closed with thoracotomy tubes in place. Intrapleural, endotracheal, femoral and pulmonary artery pressures were then recorded. Negative pressure inflation of the residual lung was carried out by removal of the residual intrapleural air. The animals were permitted to breathe spontaneously with both normal intrapleural pressures and high negative intrapleural pressures so as to overdistend the lung. The results obtained demonstrated that over-distention of residual lung does not aggravate any pulmonary hypertension produced by large pulmonary resections. The study did not evaluate the effect of overdistention by elevated endotracheal pressures. (*Reimann, A. F. and others: Pulmonary Artery Pressure Studies: Does Over Distention of Lung Cause Hypertension? Dis. Chest 39: 56 (Jan.) 1961.*)

CARDIOPULMONARY BYPASS Prolonged employment of the filming oxygenator is associated with the deposition of considerable amounts of embolic fat within the vascular tree of both humans and experimental animals. In dogs, following two hours of cardiopulmonary bypass, employing a macrobubble type oxygenator at high flow rates, coalesced fat was observed in the kidney, brain, liver and urine. The degree of embolization was similar to that following use of the filming type oxygenator. Following an identical period of bypass with a membrane oxygenator no intravascular fat was observed. The fat emboli observed probably resulted from alterations in the state of emulsification of serum lipids on prolonged direct exposure to gases in the oxygenator. The clinical significance of fat embolization during cardiopulmonary bypass is not known. (*Owens, G., Adams, J., and Scott, H. W.: Embolic Fat as Measure of Adequacy of Various Oxygenators, J. Appl. Physiol. 15: 999 (Nov.) 1960.*)

EXTRACORPOREAL CIRCULATION In a series of 30 cases of cardiopulmonary bypass and an additional 4 cases using hypothermia, anesthesia consisted of thiopental induction, curarization and hyperventilation with

a positive-negative phase ventilator. The aim was to establish a respiratory alkalosis of *p*H 7.5 and P_{CO_2} of 30. This was accomplished with a respiratory rate of 18–20 per minute and a respiratory minute volume of 15–20 liters in adults, and with a respiratory rate of 20–25 per minute and a respiratory minute volume of 10–15 liters in children. Arterial *pH*, P_{CO_2} and P_{O_2} were checked at twenty minutes after the onset of hyperventilation, after opening of the thorax, ten minutes after heparinization, off bypass, before extubation, after return of consciousness, and after each occurrence that might have produced a fall in *p*H. At times twenty to thirty minutes of initial hyperventilation had produced *p*H values of 7.65. A small fall of the hydrogen ion concentration usually occurred with the opening of the chest. After removal of the clamps under hypothermia an average decrease of the *p*H to 7.35 was noted; with cardiopulmonary bypass the fall was less (*p*H 7.45). Arterial P_{CO_2} changes parallelled and preceded *pH* changes. Arterial P_{O_2} values below 120 mm. of mercury were not observed. Postoperative pulmonary edema was not seen. (*Bahuet, R., and Ploquin, F.: Notre Expérience de l'Anesthésie et de la Ventilation Artificielle en Chirurgie à Coeur Ouvert, Anesth. Analg. (Par.) 17: 9 (Jan.-Feb.) 1960.*)

CARDIAC METABOLISM Myocardial metabolism was studied during extracorporeal circulation. An increased coronary blood flow occurred. There was an increase in the utilization of oxygen, lactate and pyruvate. The metabolic changes occurred early in the perfusion, and prolongation of perfusion beyond 30 minutes had little additional effect. (*Wallace, H., Rheinlander, H., and Sugarman, H.: Cardiac Metabolism During Extracorporeal Circulation, A. M. A. Arch. Surg. 82: 138 (Jan.) 1961.*)

MYOCARDIAL ACIDOSIS The force of ventricular contraction was measured in animals. Acidosis was produced by infusing lactic acid or reducing body perfusion. During acidosis there were decrease of myocardial contractility and arterial pressure; there was decreased response to injection of vasopressors. Patients in terminal shock also have metabolic acidosis. In both animals and man, acidosis can be corrected by the use of THAM and sodium bicarbonate. Response to vasopressor drugs then improves. (*Thrower, W., Darby, T., and Aldinger, E.: Acid-Base Derangements and Myocardial Contractility, A. M. A. Arch. Surg. 82: 56 (Jan.) 1961.*)

CARDIAC ARREST Filling the arrested heart with blood from the patient's elevated limbs can restart beating. The method is effective provided cardiac arrest has been immediately recognized and no more than 15 seconds are spent in the maneuver. Three case histories are reported, in each of which the pulse became imperceptible. In one there was no bleeding when a skin incision was made. In all three the patients' legs were held vertically Within 15 seconds a pulse returned. All 3 patients recovered, in one a gastroectomy was completed, and in another an axillary dissection was performed four days later. (*Woodward, W. W.: Cardiac Arrest Treated by Elevation of Limbs for Fifteen Seconds, Lancet 2: 1120 (Nov. 19) 1960.*)

ECG BY TELEPHONE A simple telecardiographic system is designed which consists of a transmitter and a receiver. The transmitter produces a carrier wave which is modulated by the patient's heart beat. This results in a sound, the frequency of which varies with the voltage variations of the heart. A telephone placed close to the transmitter in the hospital or laboratory allows the sound to pass over the wires to a receiver in the doctor's office which converts the frequency variations back into voltage variations and there activate a receiving electrocardiograph. No direct wire connections between transmitter and telephone or telephone and receiver are necessary. (*Winsor, T., Sibley, A. E., and Fisher, E. K.: Electrocardiogram via Telephone, Western Medicine 1: 10 (Dec.) 1960.*)

HEMORRHAGE Factors which influence hemodilution following hemorrhage were studied. When animals rapidly lost 35 per cent of their blood volume, there was immediate severe hypotension, and hemodilution occurred rapidly. When blood was removed