LITERATURE REVIEW

Carol L. Lake, MD, Editor

Dahlgren G, Ohqvist G, Brodin L-A, et al: Isoflurane and intravenous anesthesia used for induction before coronary artery bypass grafting. Acta Anaesthesiol Scand 33:99-104, 1989

In nine patients with coronary artery disease, the authors evaluated the effects of fentanyl, 6 μg/kg, and thiopental, 1.2 mg/kg, followed by nitrous oxide, 60%, and isoflurane, 2.5% inspired, to avoid undesirable hemodynamic changes during anesthetic induction. Inspired isoflurane concentration was reduced to 1.5% over 5 minutes (before intubation). Radionuclide determinations of ejection fraction (systolic and diastolic volume indices), thermodilution measurements of cardiac output, and ECG lead V_5 recordings for ischemia were made in the awake state, after administration of fentanyl and thiopental, after isoflurane and pancuronium, before and after intubation. As in previous studies, ejection fraction decreased slightly with intubation, although heart rate was unchanged and systolic pressure decreased. Despite the concentration of isoflurane used, only one patient showed an increase in ischemia, with both ST segment depression and increased pulmonary artery pressures. These results seem to confirm the efficacy of combinations of narcotic-inhalation anesthesia in patients with coronary artery disease.

Angelini P: Normal and anomalous coronary arteries: Definitions and classification. Am Heart J 117:418-434, 1989

Because no clear definition of normal coronary arteries has been proposed or identified, this paper suggests an embryologic and organic method to classify coronary anomalies in an attempt to define normality. The coronary arterial circulation develops from three separate components; the coronary buds in the wall of the aortopulmonary trunk, the sinusoids, and the vascular endothelial network. In most instances, hypoplasia of the myocardium is associated with a hypoplastic coronary arterial branch. True coronary anomalies occur in less than 1% of cases. One variation in coronary anatomy not often appreciated is the presence of a third coronary artery, the conal artery, arising independently from the aortic wall in about 50% of cases. Likewise, the aortic opening into a coronary artery is normally equal to or larger than the diameter of the artery.

Normal patterns in the distal coronary arteries include a probable (but unidentified) ideal ratio of arterioles to grams of myocardium, absence of crossing of extramural coronary arteries, entrance of extramural coronary arteries into the myocardium only at their distal end, no large epicardial right ventricular branches from the left anterior descending coronary artery, and origination of the anterior septal branches from the left anterior descending coronary artery. The findings of this paper are confirmed in the report of Hutchins et al: Development of the coronary arteries in the embryonic human heart. Circulation 77:1250-1257, 1988.

Kugler JD, Danford DA: Pacemakers in children: An update. Am Heart J 117:665-679, 1989

Among the issues facing the pediatric cardiologist are the indications for, methods of implantation, and types of pacemakers. Current indications are similar to those promulgated by the Joint Task Force of the American College of Cardiology and the American Heart Association, but additional indications in children are the presence of asymptomatic congenital complete atrioventricular (AV) block with mean awake heart rates of less than 50 beats/min or evidence of junctional instability, asymptomatic patients with congenital AV block with long QT syndrome, and brady-tachy syndrome in children requiring antidysrhythmic drugs other than digitalis. Epicardial leads and subxiphoid placement obviate the cosmetic problems associated with transvenous systems. However, transvenous pacemakers are often placed by pediatric cardiologists because of their increased expertise in the manipulation of catheters through the hearts of children after repair of complex congenital anomalies.

The requirement for rate responsiveness is obviated by use of either dual chamber units or physical activity-dependent rate-responsive ventricular pulse generators. Rate-responsive atrial pacing also avoids the pacemaker syndrome and is useful in children with sinus node dysfunction. Follow-up protocols after pacemaker implantation in children are similar to those in adults.

Heusser F, Fahey JT, Lister G: Effect of hemoglobin concentration on critical cardiac output and oxygen transport. Am J Physiol 253: H527-H532, 1989

Infants with congenital cardiac disease may have reduced tolerance to alterations in cardiac output during their period of neonatal anemia. In a sheep model, inflation of a balloon catheter in the right atrium was used to reduce cardiac output at hemoglobin concentrations of 7, 10, 14, and 16 g/dL, produced by exchange transfusion with plasma or packed erythrocytes. There were no differences in cardiac output at the different hemoglobin concentrations. Systemic oxygen transport increased as hemoglobin concentration increased. With decrements in cardiac output, the critical