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Articles of Interest

Section Editor: Rick G. Smith, BS, CCP

ANESTHESIA/PHARMACOLOGY

Epsilon-aminocaproic acid in coronary artery bypass graft surgery: Preincision or postheparin?
Kluger R, Olive DJ, Stewart AB, Blyth CM, Anesthesiology 2003;99:1263–1269.

Epsilon-aminocaproic acid (EACA) is a common antifibrinolytic agent administered prior to cardiopulmonary bypass. This study determined that EACA was equally efficacious if administered either preincision or after heparinization. Due to the potential thrombotic complications, the authors suggest full anticoagulation before administration of EACA.

The hypotensive effects of propofol at different sampling sites in cardiopulmonary bypass model.
Su HB, Chen TY, Cheng CF, et al. Acta Anaesthesiol. 2003;41:125–130.

Cardiopulmonary bypass has minimal effects on the pharmacokinetics of fentanyl in adults.
Hudson RJ, Thomson IR, Jassal R, et al. Anesthesiology 2003;99:847–854.

Successful use of bivalirudin for cardiopulmonary bypass in a patient with heparin-induced thrombocytopenia.
Gordon G, Rastegar H, Schumann R. J Cardiothorac Vasc Anesth. 2003;17:632–635.

Modulation of circulating endothelin-1 and big endothelin by nitric oxide inhalation following left ventricular assist device implantation.
Wagner FD, Buz S, Knosalla C, et al. Circulation 2003 108(Suppl 1):II278–284.

BIOCOMPATIBILITY

Heparin-coated circuits and reduced systemic anticoagulation applied to 2500 consecutive first-time coronary artery bypass grafting procedures.
Øvrum E, Tangen G, Tølløfsrud S. Ann Thorac Surg. 2003;76:1144–1148.

Retrospective analysis of 2500 consecutive coronary artery bypass graft (CABG) procedures using heparin-coated perfusion circuits and low systemic anticoagulation demonstrated superior patient outcomes. The authors suggest this perfusion protocol may present significant advantages and a better alternative to off-pump CABG procedures.

On the influence of flow conditions and wettability on blood material interactions.
Spijker HT, Graaff R, Boonstra PW, et al. Biomaterials 2003;24:4717–4727.

BLOOD CONSERVATION

The management of perioperative bleeding.
Koh MB, Hunt BJ. Blood Rev 2003;17:179–85.

This review details the pathology of perioperative coagulation disorders and pharmacologic treatment. Point-of-care diagnostic tools such as thromboelastography and platelet function analysis provide timely information for accurate clinical treatment. Cardiopulmonary bypass and liver transplantation are specifically addressed.

Blood use in patients undergoing coronary artery bypass surgery: impact of cardiopulmonary bypass pump, hematocrit, gender, age, and body weight.
Scott BH, Seifert FC, Glass PS. Anesth Analg. 2003;97: 958–963.

Allogeneic blood transfusion requirements after minimally invasive versus conventional aortic valve replacement: a risk-adjusted analysis.
Stamou SC, Kapetanakis EI, Lowery R, et al. Ann Thorac Surg. 2003;76:1101–1106.

Quality of intraoperative autologous blood withdrawal used for retransfusion after cardiopulmonary bypass.
Flom-Halvorsen HI; Øvrum E; Øystese R; Brosstad F. Ann Thorac Surg. 2003;76:744–748.

CEREBRAL PROTECTION

The effects of isoflurane-induced electroencephalographic burst suppression on cerebral blood flow velocity and cerebral oxygen extraction during cardiopulmonary bypass.
Reinsfelt B, Westerlind A, Houltz E, et al. Anesth Analg. 2003;97:1246–1250.

Transcranial Doppler: an early predictor of ischemic stroke after cardiac arrest.
Carbutti G, Romand JA, Carballo JS, et al. Anesth Analg. 2003;97:1262–1265.

Gender influence on cognitive function after cardiac operation.
Hogue CW, Lillie R, Hershey T, et al. Ann Thorac Surg. 2003;76:1119–1125.

pH-stat versus alpha-stat perfusion strategy during experimental hypothermic circulatory arrest: a microdialysis study.
Pokela M, Dahlbacka S, Biancari F, et al. Ann Thorac Surg. 2003;76:1215–1226.

The resurgence of a pH-stat strategy during deep hypothermia and circulatory arrest (DHCA) adds controversy to the protective interventions to restore and protect the fragile brain metabolism during reperfusion and rewarming with cardiopulmonary bypass. pH-stat is associated with less metabolic derangements, neurocognotive recovery and survival in a pig model.

Comparison of cerebral embolization during off-pump and on-pump coronary artery bypass surgery.
Lund C, Hol PK, Lundblad R, et al. Ann Thorac Surg. 2003;76:765–770.

Cerebral embolization during cardiac surgery: impact of aortic atheroma burden.
Mackensen GB, Ti LK, Phillips-Bute BG, et al. Br J Anaesth. 2003;91:656–661.

Impact of hypothermic selective cerebral perfusion compared with hypothermic cardiopulmonary bypass on cerebral hemodynamics and metabolism.
Strauch JT, Spielvogel D, Haldenwang PL, et al. Eur J Cardiothorac Surg. 2003;24:807–816.

Determinants of stroke after coronary artery bypass grafting.
D'Ancona G, Saez de Ibarra JI, Baillot R, et al. Eur J Cardiothorac Surg. 2003;24:552–556.

Postoperative hypoxia is a contributory factor to cognitive impairment after cardiac surgery.
Browne SM, Halligan PW, Wade DT. J Thorac Cardiovasc Surg. 2003;126:1061–1064.

HEMATOLOGY

The following two reviews, authored by distinguished clinicians and experts in their fields, address common problems in hemostasis and the pharmacologic interventions to fibrinolysis with regards to deep hypothermia and circulatory arrest. Proper anticoagulation combined with point-of-care testing provide the best hemostasis monitoring to avoid postoperative bleeding.

Monitoring anticoagulation and hemostasis in cardiac surgery.
Shore-Lesserson L. Anesthesiol Clin North America 2003 21:511–526.

Current status of antifibrinolytics in cardiopulmonary bypass and elective deep hypothermic circulatory arrest.
Green JA; Spiess BD. Anesthesiol Clin North America 2003; 21:527–551.

INTRA-AORTIC BALLOON PUMP

Intra-aortic balloon counterpulsation in US and non-US centres: results of the Benchmark Registry.
Cohen M, Urban P, Christenson JT, et al. Eur Heart J 2000;24:1763–1770.

MYOCARDIAL PROTECTION

Myocardial protection with intermittent cold blood during aortic valve operation: antegrade versus retrograde delivery.
Lotto AA, Ascione R, Caputo M, et al. Ann Thorac Surg 2003;76:1227–1233.

Optimal dose and mode of delivery of Na+/H+ exchange-1 inhibitor are critical for reducing postsurgical ischemia-reperfusion injury.
Corvera JS, Zhao ZQ, Schmarkey LS, et al. Ann Thorac Surg 2003;76:1614–1622.

Leukocyte-depleted secondary blood cardioplegia attenuates reperfusion injury after myocardial ischemia.
Civelek A, Roth M, Lemke P. Thorac Cardiovasc Surg. 2003;51:49–254.

Sodium-hydrogen exchanger inhibition, pharmacologic ischemic preconditioning, or both for extended cardiac allograft preservation.
Ryan JB, Hicks M, Cropper JR, et al. Transplantation 2003;76:766–771.

PATHOPHYSIOLOGY

The systemic inflammatory response to cardiopulmonary bypass.
Pintar T; Collard CD. Anesthesiol Clin North America 2003:21:453–464.

A comprehensive review of the physiologic responses to cardiopulmonary bypass also details clinical strategies to attenuate the morbidity associated with the systemic inflammatory response.

Mannitol and dopamine in patients undergoing cardiopulmonary bypass: a randomized clinical trial.
Carcoana OV, Mathew JP, Davis E, et al. Anesth Analg. 2003;97:1222–1229.

Kidney-specific proteins in elderly patients undergoing cardiac surgery with cardiopulmonary bypass.
Boldt J, Brenner T, Lang J, et al. Anesth Analg. 2003;97: 1582–1589.

ONO-6818, a novel, potent neutrophil elastase inhibitor, reduces inflammatory mediators during simulated extracorporeal circulation.
Yoshimura Y, Hiramatsu Y, Sato Y, et al. Ann Thorac Surg. 2003;76:1234–1239.

Oxygen metabolism during and after cardiac surgery: role of CPB.
Parolari A, Alamanni F, Juliano G, et al. Ann Thorac Surg. 2003;76:737–743.

Chemokines and the inflammatory response following cardiopulmonary bypass—a new target for therapeutic intervention?—A review.
Ben-Abraham R, Weinbroum AA, Dekel B, Paret G. Paediatr Anaesth. 2003;13:655–661.

PERFUSION TECHNIQUE

Pulmonary endarterectomy: experience and lessons learned in 1,500 cases.
Jamieson SW, Kapelanski DP, Sakakibara N, et al. Ann Thorac Surg. 2003;76:1457–1462.

Temporary cardiopulmonary bypass and isolated lung ventilation for tracheal stenosis and reconstruction.
Chiu CL, Teh BT, Wang CY. Br J Anaesth. 2003;91:742–744.

Right heart assist for beating heart coronary artery bypass grafting.
Hughes P, Hasenkam JM, Severinsen IK. Eur J Cardiothorac Surg. 2003;24:762–769.

> Right heart assist reduces postoperative bleeding, myocardial damage, ventilator time and maintains hemodynamic stability during off-pump coronary bypass surgery.

'All in one' cardiopulmonary bypass circuit for aortic surgery.
Ueda T, Kawata T, Tsuji T, et al. Int J Artif Organs 2003; 26:924–928.

VENTRICULAR ASSIST

Anesthetic management for implantation of the Jarvik 2000 left ventricular assist system.
Nussmeier NA, Probert CB, Hirsch D, et al. Anesth Analg. 2003;97:964–971.

Ventricular cardiac-assist devices in infants and children: anesthetic considerations.
Schindler E, Müller M, Kwapisz M, et al. J Cardiothorac Vasc Anest. 2003;17:617–621.