Articles of Interest

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APROTININ

High-dose aprotinin reduces activation of hemostasis, allogeneic blood requirement, and duration of postoperative ventilation in pediatric cardiac surgery.

Aprotinin reduces operative closure time and blood product use after pediatric bypass.

Does aprotinin influence the inflammatory response to cardiopulmonary bypass in patients?

BIOCOMPATIBILITY

Influence of PMEA-coated bypass circuits on perioperative inflammatory response.

Influence of two different perfusion systems on inflammatory response in pediatric heart surgery.

Heparin-coated closed perfusion systems with a centrifugal pump provides reductions in complement activation and PMN elastase compared with uncoated, open venous reservoirs and roller pumps for congenital heart surgery. The study demonstrated no differences in interleukin and tissue necrosis factor concentrations.

CARDIOPULMONARY SUPPORT

Experience with percutaneous venoarterial cardiopulmonary bypass for emergency circulatory support.

CEREBRAL PROTECTION

Xenon attenuates cardiopulmonary bypass-induced neurologic and neurocognitive dysfunction in the rat.

The importance of prior stroke for the adjusted risk of neurologic injury after cardiac surgery for women and men.

Direct visualization of minimal cerebral capillary flow during retrograde cerebral perfusion: an intravital fluorescence microscopy study in pigs.

In a laboratory (piglet) model, microscopy was used to visualize cerebral capillary blood flow and functional capillary density and cerebral tissue oxygenation were measured during retrograde cerebral perfusion (RCP). After deep hypothermic circulatory arrest with RCP, no significant capillary blood flow was observed and poor tissue oxygenation indicated by nicotinamide adenine dinucleotide hydrogen (NADH). Significant brain edema was evident as well following RCP. The authors suggest the use of RCP is beneficial to remove air and debris from the cerebral circulation benefit after circulatory arrest.

Deep hypothermic circulatory arrest and global reperfusion injury: avoidance by making a pump prime reperfusate—a new concept.

Oxygen free radicals cause global reperfusion injury resulting in organ and endothelial dysfunction after deep hypothermic circulatory arrest. The authors were able to attenuate many of the deleterious effects with a selected reperfusate and prime composition when reinstating cardiopulmonary bypass and provided good protection to major organ systems.
Novel cerebral physiologic monitoring to guide low-flow cerebral perfusion during neonatal aortic arch reconstruction.

HEMATOLOGY
Agreements between the prothrombin times of blood treated in vitro with heparinase during cardiopulmonary bypass (CPB) and blood sampled after CPB and systemic protamine.

The predictive value of modified computerized thromboelastography and platelet function analysis for postoperative blood loss in routine cardiac surgery.

Modified thromboelastography (TEG) and platelet function analysis (PFA) were compared to determine their usefulness to identify hemostatic complications and predict postoperative blood loss following cardiac surgery. TEG provided better predictive values than PFA. Early analysis and targeted treatment of postoperative bleeding was important to clinical success.

Patients with a history of type II heparin-induced thrombocytopenia with thrombosis requiring cardiac surgery with cardiopulmonary bypass: a prospective observational case series.

Heparin-induced thrombocytopenia with thrombosis (HITT) is a significant challenge in those patients undergoing cardiopulmonary bypass. Anticoagulation with hirudin and monitoring with ecarin clotting time was used to direct hirudin therapy. Case reports of these six patients are provided. Postoperative complications included bleeding, multiple blood transfusions, and a high incidence of reexploration.

Bivalirudin monitored with the ecarin clotting time for anticoagulation during cardiopulmonary bypass.

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Adenosine in myocardial protection in on-pump and off-pump cardiac surgery.

Significant interest in adenosine has provided investigators with numerous opportunities to demonstrate its cardioprotective effects. In this review article, the authors describe adenosine’s actions on preventing myocardial ischemia, reperfusion injury and promoting coronary vasodilation. Disparities between clinical studies and laboratory experiments are noted by the authors in this review article.

Improved myocardial function using a Na+/H+ exchanger inhibitor during cardioplegic arrest and cardiopulmonary bypass.

PATHOPHYSIOLOGY
Alveolar recruitment strategy improves arterial oxygenation after cardiopulmonary bypass.

Changes in respiratory mechanics during cardiac surgery.

Renal dysfunction after cardiac surgery with normothermic cardiopulmonary bypass: incidence, risk factors, and effect on clinical outcome.

Inflammatory response to cardiopulmonary bypass.


Abstract

PEDIATRIC PERFUSION


This review on pediatric perfusion outlines strategies to reduce the complications associated with the systemic inflammatory response, hemodilution, and transfusions.

PERFUSION TECHNIQUE


Retrograde autologous priming (RAP) allows substantial reductions in priming volume and hemodilution during cardiopulmonary bypass. In addition to reducing transfusion requirements, RAP also maintained colloid osmotic pressure, reduced extravascular lung water and weight gain following cardiac surgery.


Axillary artery cannulation is a useful alternative to ascending aortic cannulation for cardiopulmonary bypass. Useful in reoperations, atherosclerotic aortas and aortic dissections, axillary artery cannulation can be accomplished either by direct cannulation or inter-
position of a prothetic graft anastomosed to the axillary artery.


Methylene blue administration reverses severe hypotension (vasoplegia) following cardiopulmonary bypass.


VENTRICULAR ASSIST