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Title: PLATELET-RICH PLASMAPHERESIS DURING CARDIAC REOPERATIONS
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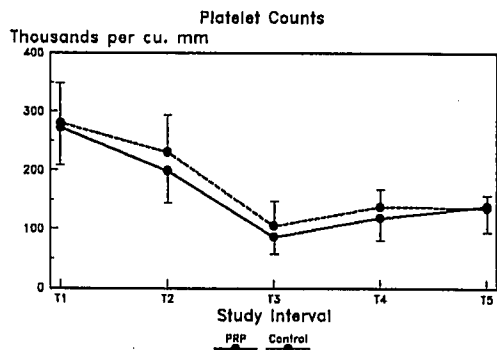
Introduction: Heightened awareness of the risks associated with the use of homologous blood products has led to increased interest in autologous blood products and blood conservation. A new development in this field has been platelet-rich plasmapheresis (PRP).

Methods: With IRB approval and written informed consent, 14 patients undergoing elective repeat cardiac surgery were randomized to PRP (n=8) or control groups (n=6). The PRP group underwent plasmapheresis using a Plasma Saver (Haemonetics Corp, Braintree, MA) following the induction of anesthesia. Twenty ml/kg of PRP was separated and stored at room temperature. The control group did not have plasmapheresis performed. Following protamine administration, PRP was returned to patients in the PRP group. Following this, patients bleeding excessively in either group received fresh frozen plasma and platelet concentrates. Coagulation studies were performed at anesthetic induction (T1), following PRP (T2), 10 minutes after protamine administration (T3), 30 minutes following PRP reinfusion (T4) and 24 hours postoperatively (T5). Bleeding times were obtained at T1 and T5, and blood product usage was recorded. Data were analyzed using two-way ANOVA and unpaired Student's T-tests. $P < 0.05$ was considered significant.

Results: The PRP and control groups were similar in demographic characteristics, type of surgery, length of cardiopulmonary bypass, and duration of aortic cross-clamping. Platelet counts, prothrombin times, and partial thromboplastin times changed significantly throughout surgery in both groups, but did not differ between the PRP and control groups at any study interval. In addition, there were no differences in blood product usage, chest tube drainage, or bleeding times between the groups. Platelet counts are illustrated in the Figure.

Discussion: Perioperative bleeding still constitutes a major problem in repeat cardiac surgical procedures. The collection of platelet-rich plasma prior to CPB, with reinfusion after surgical hemostasis and full reversal of heparin, has been reported to result in less bleeding, higher postoperative platelet counts, and diminished requirements for blood products.¹ The results of the current randomized, controlled study did not demonstrate any advantage of PRP despite the large volume of PRP. Further investigations are needed to define the appropriate indications for PRP.

Reference: 1. Ann Thorac Surg 47:897-902, 1989.



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Title: A SOLUTION FOR HEMODYNAMIC INSTABILITY THAT MINIMIZES BLOOD TRANSFUSION REQUIREMENT IN LIVER TRANSPLANTATION

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The most critical time in anesthetic management of liver transplantation occurs during reperfusion of the grafted liver. At this time, the sudden influx of a large quantity of potassium from ischemic hepatocytes and from the organ preservation solution occurs, causing changes in electric conduction and perhaps contributing (along with acidic and metabolic toxic substances) to depression of myocardial contractility and vascular tone. Opening of the portal vein to flush out metabolites and potassium before establishment of complete vascular connection of the graft liver may partially attenuate the hemodynamic derangements, but this process may further complicate the preexisting coagulation problems caused by the required massive transfusion. We tested the hypothesis that a slow infusion of albumin into the liver during the anhepatic phase would lead to greater hemodynamic stability and reduce the amount of blood required for transfusion.

After approval of our Institutional Review Board, we studied 15 patients. During construction of suprahepatic and infrahepatic vascular anastomosis, a slow infusion of 5% albumin was continued through the portal vein. We placed a 12 F catheter into the open vena cava and collected the flushed solution during 5 separate periods over approximately 20 min (Figure). Each period indicates 100 ml of solution infused. Potassium content of collected samples was measured using a radiometer after adequate dilution.

Significant reduction of potassium content from period 1 to period 5 is shown in the figure. Our results indicated that slow albumin perfusion was able to remove two-thirds of the potassium (and we assume vasoactive substances also) contained in the vascular tree of graft liver. The infusion also eliminated the requirement of preflushing of the liver with blood; therefore, hemodynamic stability was maintained during reperfusion of the grafted liver, and massive transfusion and coagulopathy were avoided during a critical period of liver transplantation.

