Autotransfusion and Hemostatic Changes in Open Heart Surgery

Thesis Submitted for Partial Fulfillment of M.D. Degree in Clinical Pathology

BY

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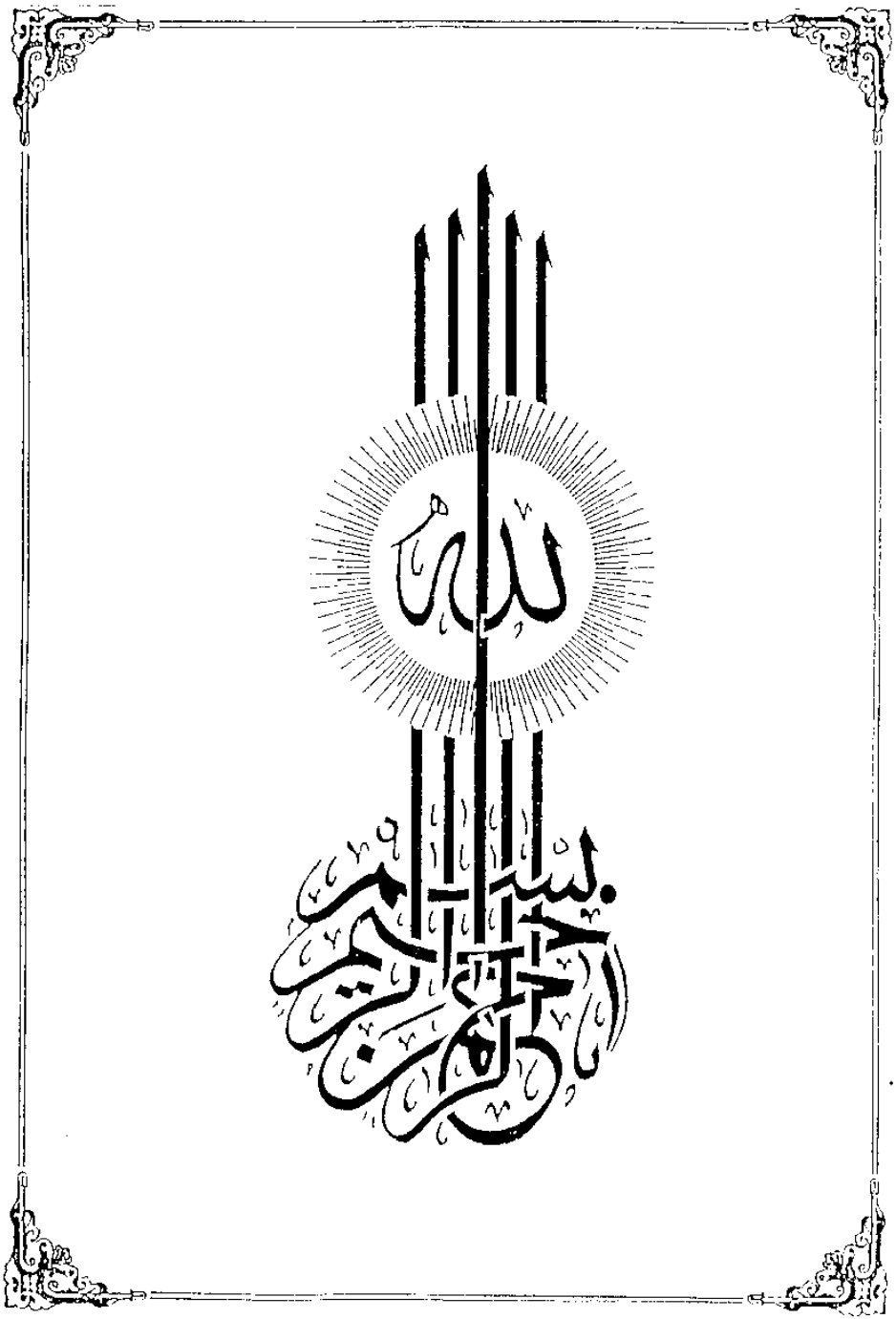
***** 1998 *****



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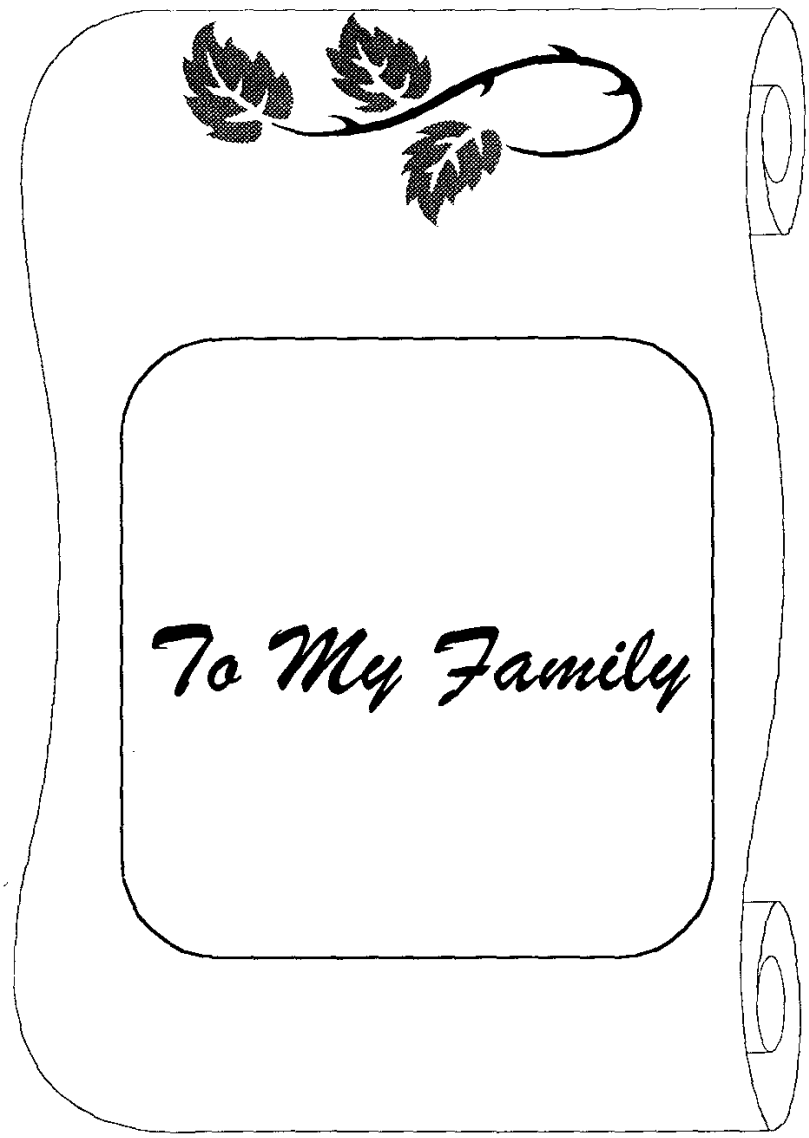
بسم الله الرحمن الرحيم

قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

صدق الله العظيم

سورة البقرة - الآية ٣٢



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NAHID MOHAMED MEDHAT SHOEB

Abstract

Background:

The combination of several techniques is necessary to minimize the transfusion requirements for open heart surgery. Therefore, techniques designed to reduce homologous blood usage have been developed. One of the methods is autotransfusion of shed mediastinal blood after open heart surgery. the objectives of the present study were to investigate the safety and efficacy of these techniques.

Methods:

100 patients with first time open heart surgery were divided into two groups: conservative group (n = 50) received combined autologous blood transfusion and homologous blood only if needed. Control group (n = 50) received only homologous blood transfusion post-cardiopulmonary bypass.

Results:

Both groups were matched as regard age, sex, and cardiopulmonary bypass time. Preoperative hematological data were similar in both groups ($P > 0.05$). A strict blood conservation program was applied. Only 14% were fit for predeposit collection (300 ± 100 mL), removal of autologous blood prebypass with acceptance of normovolemic anemia (834 ± 206 mL) (Hct%: 26.42 ± 2.45%), retransfusion of heart lung machine content (oxygenator blood: 485.00 ± 98.07 mL) and autotransfusion of unwashed hemofiltered shed mediastinal blood collected in the cell saver (Solcotrans blood: 1030 ±

206). 5% of patients had combined homologous and autologous blood transfusion. Significant reduction in homologous RBC transfusion were achieved in conservative group (0.52 ± 0.32 units), although control group had 5.5 ± 1.62 units ($P < 0.001$). 12% among conservatives had homologous FFP (225.00 ± 216 mL), while 76% of controls had 1236.84 ± 308 mL ($P < 0.001$). 18.7% reduction in the allogeneic blood usage with significant reduction in the total donor exposure per patient were achieved.

Hematological and coagulation assessment of Solcotrans blood device showed extensive fibrinolysis compared to oxygenator blood before retransfusion. FDPs by D-dimer test (1.305 ± 244.62 ng/mL, 800.19 ± 120.94 ng/mL), fibrinogen concentration (41.66 ± 8.12 mg/dL, 123.02 ± 12.41 mg/dL), platelet count (41.56 ± 10.16 x 10^9/L, 108.22 ± 17.20 x 10^9/L). Postoperative hematolcgical and clotting profile revealed no complications or adverse effect of autologous blood transfusion. Total amount of blood transfusion requirement in both groups (2.561 ± 374 mL and 2.220 ± 516 mL) which was correlated to the length of CPB ($r = 0.39$; $P \leq 0.001$) and to the total amount of blood loss ($r = 0.63$; $P < 0.001$).

Conclusion:

We conclude that combined conservation autologous program including reinfusion of shed mediastinal blood is safe, compatible and effective method of reducing homologous blood transfusion and decrease the risk related to donor exposure.