

## **Our First Experience with the Use of Mini Bypass System Synergy SORIN**

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**Purpose:** Minimizing of the current ECC systems is the logical evolution in the field of cardiopulmonary bypass technology research. The new completely closed circuits consists of a centrifugal pump, an oxygenator, reduced tubing length and biocompatible surface. Cardiotomy reservoir and conventional suction devices are eliminated. The purpose of our initial study was to introduce the mini ECC into clinical practice, to evaluate safety, efficacy and potential clinical benefits of it.

**Methods:** 40 patients who underwent primary isolated CABG at our institution were prospectively studied. 20 patients (MINI) were operated upon using a closed circuit IDEAL/SYNERGY, Sorin, Italy and were operated by one surgeon. Second group of 20 patients (CPB) was operated with the use of conventional extracorporeal circulation with closed collapsible reservoir. Analysis of various demographic, preoperative, intraoperative, perfusion and postoperative parameters was performed.

**Results:** Demographic data did not differ significantly between the groups concerning age ( $67\pm 9$ ;  $71\pm 8$ ) and body surface area ( $1,97\pm 0,19$ ;  $1,93\pm 0,23$ ). There was a difference between MINI and CPB group with regard to left ventricular function ( $47\pm 10$ ;  $60\pm 13$ ;  $p=0,002$ ), duration of CPB ( $61\pm 16$ ;  $86\pm 22$  min,  $p=0,0003$ ), aortic cross-clamp time ( $34\pm 10$ ;  $46\pm 12$  min;  $p=0,007$ ) and number of grafts per patient ( $2,2\pm 0,5$ ;  $2,7\pm 0,7$ ;  $p=0,01$ ). There was no difference in drainage blood loss ( $875\pm 400$ ;  $792\pm 319$  ml) and length of ventilation ( $7\pm 4$ ;  $8\pm 5$  hours). There was a significantly reduced prime and hemodilution during CPB in MINI group ( $824\pm 261$  vs.  $1565\pm 236$  ml;  $p<0,0001$ ; HCT  $0,31\pm 0,03$  vs.  $0,23\pm 0,03$ ;  $p<0,0001$ ). There was also significantly reduced the need for transfusions in MINI group ( $m=0,5$  vs.  $m=2$  U RBC/patient). There was no mortality in either group.

**Conclusions:** The use of mini bypass system SYNERGY/SORIN is very safe and after several procedures easy for the perfusionist and surgeon but one has to keep in mind a different actions during perfusion (negative pressure in venous line, patient acts as the reservoir). Close cooperation of the anesthesiologists is an essential condition for uneventful perfusion (precise fluid balance). We consider the bubble trap as the venous inlet placed at the top of the oxygenator as the basic safety element (air bubbles elimination) not only of this system but for all such closed mini systems. We observed significant reduction of the priming volume and blood transfusion requirement, and significant increase of HCT during CPB in the MINI group. Further studies are necessary to verify the benefits of minimized extracorporeal circuits systems.

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