

Sternal microcirculation following pedicled versus skeletonized harvesting of the internal thoracic artery

Lichtenberg A¹, Knobloch K¹, Martens A¹, Ringes-Lichtenberg², Haverich A¹

¹Division of Thoracic and Cardiovascular Surgery, Hannover Medical School,

²Department of Cardiology and Angiology, Hannover Medical School, Germany

Objectives: Regarding the elevated incidence of sternal infections following internal thoracic artery (ITA) harvesting in coronary artery bypass grafting (CABG), the impact of different harvesting techniques on sternal blood supply has not been investigated. This randomized pilot study sought to evaluate parameters of sternal microcirculation prior and after pedicled versus skeletonized harvesting of the ITA by a novel laser Doppler flowmetry and spectroscopy system [„Oxygen-To-See (O2C)", LEA Medizintechnik, Giessen]. **Material and Methods:** Twenty non-diabetic males, scheduled for CABG, were prospectively randomized. In group I (10 patients) the ITA was harvested in the pedicle technique, while in 10 patients of group II the ITA was skeletonized. After median sternotomy, the probe was placed either pre- and retrosternally for measurements of superficial (2 mm) and deep (8 mm) baseline parameters of microcirculation, such as tissue oxygen saturation, hemoglobin concentration, and blood flow. Measurements were performed also immediately after ITA harvesting. **Results:** Baseline sternal microcirculation parameters were comparable among both groups. After ITA harvesting, microcirculation parameters in the presternal area (2 mm in depth) remained unchanged, whereas blood supply at 8 mm significantly decreased in the pedicled group vs. the skeletonized group ($p < 0.05$). In the pedicled group, retrosternal parameters of microcirculation decreased significant both in superficial and in deep tissues vs. the skeletonized group ($p < 0.01$). **Conclusion:** The pedicled ITA harvesting technique leads to a significant decrease of retrosternal blood supply vs. the skeletonized technique. Hence, the use of the skeletonized method bearing a lower surgical trauma may preserve the sternal vascularity and thus may decrease the incidence of sternal wound complications.