MICROCIRCULATION OF THE STERNUM FOLLOWING
HARVESTING OF THE LEFT INTERNAL MAMMARY ARTERY

K. Knobloch, A. Lichtenberg, M. Pichimaier, A. Ruhparwar, H.
Mertsching, U. Klima, A. Haverich

Thoracic internal arterial grafts for cardiac surgery in coronary artery
disease provide excellent longterm results regarding patency. Due to the
high incidence of sternal infections, the blood supply of the sternum has
become the focus of attention. Using Oxygen-To-See (O2C), a novel
laser Doppler flowmetry and remission spectroscopy system (LEA
Medizintechnik, Giessen), it is possible for the first time to measure real
time parameters of microcirculation in vivo.

In this study, 16 patients (12 males) were enrolled who were scheduled
for coronary artery bypass grafting (CABG). After sternotomy, the probe
was placed either pre- or retrosternal for measurements of tissue oxygen
saturation (SO2), haemoglobin concentration (rHb), superficial (2mm) und
deep (8mm) blood flow. Measurements were performed before and after
clamping the left internal mammary artery (LIMA) and analysed by
repeated measurements analysis of variance (Wilks-Lambda-Test).

Baseline presternal SO2 was 87% in line with retrosternal SO2 82%.
After LIMA harvesting, presternal SO2 was rather unchanged (92% n.s.),
whereas retrosternal SO2 decreased significantly (56%). In line
retrosternal postcapillary venous filling (rHb) increased significantly after
LIMA harvesting (89 vs. 95, p<0.05). Retrosternal superficial and deep
blood flow also decreased significantly.

LIMA grafts for coronary revascularization significantly decrease
retrosternal tissue oxygen saturation with postcapillary venous stasis,
which may explain the higher incidence of sternal infections after LIMA
harvesting. In contrast, presternal tissue microcirculation is not
significantly influenced after LIMA grafting.

Thorax-, Herz- & Gefäßchirurgie, Medizinische Hochschule Hannover,
30625 Hannover