

## APPLICATION OF NTG RESTORES IMPAIRED MICROVASCULAR PERFUSION IN GASTRIC TUBE RECONSTRUCTION

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**INTRODUCTION.** Esophagectomy with Gastric Tube reconstruction is the surgical treatment for patients with cancer of the lower esophagus. Complications are stenosis of the gastric tube (25-40%) and leakage of the cervical anastomosis (5-10%), which are associated with impaired microvascular bloodflow (MBF) and ischemia of the gastric tube. Venous congestion might contribute to an impairment of gastric MBF and tissue oxygenation. Aim of the present study was to determine MBF and microvascular Hb saturation in different parts of the gastric tissue during reconstruction. It was hypothesized that local application of nitroglycerine (NTG) could resolve impaired flow if caused by venous congestion.

**METHODS.** In 18 patients, MBF was determined with laser Doppler flowmetry and  $\mu\text{HbSO}_2$  with reflectance spectrophotometry. The O2C device (Lea Medizintechnik, Giessen, Germany) incorporates both techniques, allowing simultaneous measurements in the same tissue volume. Measurements were performed in the lower, middle, and upper part of the gastric tube, following opening of the abdomen (T=0), ligation of the gastric arteries (T=1), construction of the gastric tube (T=2), and completion of the anastomosis (T=3). Then topical application of NTG was performed at the fundus. At each stage, systemic hemodynamics were recorded.

**RESULTS.** Although MBF did not change significantly in the pylorus and corpus, at the fundus MBF decreased progressively from  $212 \pm 52$  AU at T=0 to  $68 \pm 48$  at T=3 ( $p < 0.05$ ).  $\mu\text{HbSO}_2$  was between 55 and 65 % in all places at baseline, and did not change significantly during the reconstruction. Hemodynamic parameters remained stable. Following application of NTG at the fundus, MBF increased with 100 %. No change was observed in the  $\mu\text{HbSO}_2$ , or in systemic hemodynamics.

**CONCLUSION.** During gastric tube reconstruction, MBF but not  $\mu\text{HbSO}_2$  was impaired near the cervical anastomosis. This might at least partly be attributed to congestion of the venous compartment, because local application of the venodilator NTG resulted in a partial restoration of the MBF. It might be assumed that congestion of the microvascular bloodflow is compatible with an initial preservation of the  $\mu\text{HbSO}_2$ , whereas an exclusive arterial flow impairment would result in a decrease of  $\mu\text{HbSO}_2$  as well. Further research is necessary to investigate the effect of perioperative administration of NTG on the microvascular oxygenation of the gastric tube tissue.