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The effect of nitroglycerin on microvascular perfusion and oxygenation during gastric tube reconstruction.

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Esophagectomy followed by gastric tube reconstruction is the surgical treatment of choice for patients with esophageal cancer. Complications of the cervical anastomosis are associated with impaired microvascular blood flow (MBF) and ischemia in the gastric fundus. The aim of the present study was to differentiate whether the decrease in MBF is a result of arterial insufficiency or of venous congestion. To do this we assessed MBF, microvascular hemoglobin oxygen saturation ($\mu\text{HbSo}(2)$), and microvascular hemoglobin concentration (μHbcon) simultaneously during different stages of gastric tube reconstruction. In 14 patients, MBF was determined with laser Doppler flowmetry, and $\mu\text{HbSo}(2)$ and μHbcon were determined with reflectance spectro- photometry. After completion of the anastomosis, nitroglycerin was applied at the fundus. Although MBF did not change significantly in the pylorus, MBF decreased progressively during surgery in the fundus from 210 ± 18 Arbitrary Units at baseline (normal stomach) to 52 ± 9 Arbitrary Units after completion of reconstruction (mean \pm sem; $P < 0.05$). There was no change in $\mu\text{HbSo}(2)$ and μHbcon during the reconstruction. After application of nitroglycerin, MBF doubled. We conclude that MBF decreases during gastric tube reconstruction but that $\mu\text{HbSo}(2)$ and μHbcon do not. This decrease might be the result of venous congestion, which can partly be counteracted by application of nitroglycerin.

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