

Reflectance Spectrometry As Intraoperative Assessment Of Perfusion In Colorectal Anastomosis A Feasibility Study

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Purpose:

Evaluation of microperfusion in colorectal anastomoses remains a challenging problem. Intraoperative assessment of anastomotic ischemia might be an important factor in the prediction, and therefore prevention, of anastomotic dehiscence. In this study we evaluated the feasibility of tissue oximetry using shallow-penetrating visible light (visible light spectroscopy[VLS]) to measure microvascular haemoglobin oxygen saturation (Sto₂) in small, thin tissue volumes in rectal anastomoses in a standardized measurement protocol.

Materials and methods:

VLS was evaluated in 11 rectal anastomotic procedures, all within 20 cm of the anal verge by using T-Stat[®] Ischemia Detection system (T-Stat 303) using a catheter probe. Feasibility was defined as number of planned measurements performed, stability of the assessments (expressed as descriptive statistics) and adverse events caused by the VLS-system or the protocol.

Results:

Of 220 planned recordings, 125 (57%) were carried out. Mucosal recordings showed a high standard deviation (20,4-26,6), whilst serosal recordings showed less variation (SD 4,2-13,7). After ligation of mesenteric arteries, a decrease in saturation (9%) of the rectal stump serosa was observed.

Conclusion:

Based on the results of this preliminary study, VLS is an easy to perform and fast technique for intraoperative real-time assessment of microperfusion of the serosal surface in colorectal anastomosis. Additional multicenter studies evaluating VLS as a predictor of anastomotic leakage are currently being carried out.