ABSTRACT

The primary aim of the project was to assess two different minimally invasive techniques (Transanal minimally invasive surgical approach – TAMIS and endoscopic closure) in the treatment of colorectal anastomosis dehiscence on an experimental model. The secondary aim was to evaluate microdialysis (MD), and confocal laser endomicroscopy (CLE) as novel methods potentially suitable for postoperative monitoring of colo-rectal anastomosis.

In the first step, large animal model of dehiscent colo-rectal anastomosis was developed. Two novel techniques of dehiscence closure were then compared with conventional surgical repair and laparotomy with anastomotic diversion. Thus 4 intervention groups and one untreated control group were included. Transanal repair using TAMIS and endoscopic closure were technically feasible with high healing rate. Both techniques reduced the incidence of intra-abdominal septic complications compared to control.

With regards to secondary aim, colorectal anastomosis was monitored using MD and CLE before and after the induction of ischaemia. Moreover, intramural and serosal positioning of MD sensors were compared. Both methods revealed hypoperfusion of anastomosis promptly and were proven as suitable for early detection of impaired healing.

Based on the results of this project, a novel algorithm for management of anastomotic dehiscence was proposed with the aim to increase chance of anastomotic salvage and thus decrease the risk of permanent stoma.

Keywords: anastomosis, anastomotic leak, assessment, treatment, model, animal, experiment