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Endoscopic double-layer suture for the gastrointestinal wall defect after full-thickness resection

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Background & Aims: Successful closure of gastrointestinal (GI) wall defects is the key procedure following endoscopic full-thickness resection (EFR). The aim is to describe a new endoscopic closure method for gastrointestinal wall defects after EFR procedure similar to hand-sewn double-layer suture technique — endoscopic double-layer suture (EDS) and evaluate the safety and efficacy of this method.

Methods: We retrospectively analyzed 15 patients who were presented at our institute between April 2011 and September 2015 with GI tumors (13 of gastric subepithelial tumors, 2 of colonic lateral spreading tumors) and who underwent EFR, with the resulting full-thickness wall defects being closed using EDS technique. The seromuscular and mucosal layers of wall defects were sutured separately by using endoclips with or without endoloops assistance during EDS procedure. Tumors characteristics, en bloc resection rates, suturing procedures and complications were evaluated in all patients.

Results: Successful en bloc resection and closure of wall defects were achieved in 15 cases (100%). The mean maximum size of lesions was 2.4 cm (range 1.0-3.3 cm). The mean size of wall defects after EFR was 2.1 cm (range 0.8-3.5 cm, ≥ 2.5 cm in 6 cases and < 2.5 cm in 9). The total mean closure time was 54.9 min (range 18-106 min), the mean closure time was 82.7 min (range 62-110 min) in ≥ 2.5 cm group and 36.4 min (range 18-60 min) in < 2.5 cm group ($P=0.01$). The mean number of endoclips during EDS was 26.7 (range 17-58) including 10.6 (range 5-26) in seromuscular closure and 16.1 (range 10-32) in mucosal closure. The suture procedure with endoloops assistance was completed in 7 patients (46.7%). Histological diagnosis was gastrointestinal stromal tumor (GIST) in 8 lesions (4 fundus, 2 bodies, 2 antrum), schwannoma in 3 lesions (2 fundus and 1 antrum), heterotopic pancreas in 1 lesion (antrum), cystic fibroma in 1 lesion (fundus) and early colonic adenocarcinoma in 2 lesions. Five patients developed localized peritonitis after treatment, 3 cases of postoperative peritonitis resolved after antibiotic treatment and two cases required placement of an abdominal tube for continuous peritoneal lavage 3 days without surgical intervention. No patient developed delayed hemorrhage, abdominal abscess and chronic fistula after the procedure. During the mean follow-up time of 19.1 (range 3-52) months, wounds healed in all cases and no tumor recurrence was found in any patients.

Conclusion: EDS is relatively safe and effective method for repairing GI wall defects resulting from EFR. The new closure method mimics hand-sewn double-layer suture technique during surgical procedure. However, EDS for closure of ≥ 2.5 cm GI wall defect is more time consuming, further control study is required to evaluate the efficacy of this method compared with other endoscopic GI defect suture method.

Biography

Bing-Rong Liu has completed his MD in 2002 from Chongqing Medical University. He was appointed as the Director of Gastrointestinal Department of the Second Affiliated Hospital of Harbin Medical University in June 2004. He has developed so many endoscopic new techniques and published more than 20 papers in reputed journals.

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