

A Novel Indocyanine Green Fluorescence-Guided Laparoscopic Technique to Map the Site of Obscure Gastrointestinal Haemorrhage

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Abstract

The aim of our study was to explore the feasibility of a novel fluorescence-guided laparoscopic technique to localize the obscure GI haemorrhage, using the vascular wash-out properties of indocyanine green (ICG).

Method: The feasibility study included patients with previous surgical modifications of the gut architecture, qualified as an overt obscure GI bleeding with an urgent need to be localized and controlled. Five mL of ICG was injected intravenously and laparoscopic infrared inspection was performed 30 minutes after the dye was eliminated from the bloodstream. The bleeding area mapping was demonstrated and the haemostasis was carefully performed using endoscopy or laparoscopic techniques.

Results: A series of two cases were included in our feasibility study so far. Case 1. A 43-year old male, who recently received a Laparoscopic Roux-en-Y gastric bypass (RYGB), developed a recurrent GI bleeding. Post dye wash-out intense signal was demonstrated at the level of duodenum and weaker at the gastric remnant. The laparoscopic trans-gastric exploration of the remnant identified an active bleeding source siding the stapled line and haemostasis was achieved with laparoscopic ligation using stitches. Case 2. A 66-year old male patient who underwent an open Whipple resection nine months before, was admitted for a repeated GI bleeding. The inspection of the biliopancreatic limb noticed an intense fluorescent signal toward the enteral proximal end. Upper digestive endoscopy confirmed the presence of an active bleeding source from ectopic jejunal varices siding the choledoco-jejunal anastomosis. Argon plasma coagulation was performed endoscopically and achieved hemostasis.

Conclusions: A successful novel ICG fluorescence-guided laparoscopic mapping technique was used to localize the site of the obscure GI haemorrhage and to facilitate the prompt bleeding control. To the best of our knowledge these are the first published cases for which this technique was used.

Key words: GI bleeding, gastric bypass, pancreatoduodenectomy, indocyanine green, infrared laparoscopy