

## CASE REPORT

# Endoscopic Tattooing of Small Bowel by Double - Balloon Endoscopy

Abild Nina<sup>1</sup>, Bulut Orhan<sup>2</sup>

<sup>1</sup>Department of Surgical Gastroenterology, Køge Hospital, Køge, <sup>2</sup>Hvidovre University Hospital, University of Copenhagen, Denmark.

## ABSTRACT

Inflammatory vascular polyps that are complicated by bleeding are difficult to diagnose and localise during the operation. With the improvement in the diagnosis of the small bowel tumours with double balloon endoscopy, the preoperative localization of the lesion is essential to undertake appropriate surgery, and to reduce the time for surgery and avoid resection of wrong segment of small bowel. Double balloon endoscopic tattooing of small bowel tumours and lesions is a new modality to ease the surgery when resection of small bowel is indicated. The literature about double balloon endoscopic tattoo is scant. We present a rare case of small bowel polyp that caused bleeding and the successful use of double balloon endoscopic tattoo preoperatively for the localization of the lesion during surgical procedure. (*Dig Endosc* 2013;4(2):49-51)

**Key Words:** Double balloon endoscopy - Small bowel tumours – Tattoo - Tumour localization - SPOT

## Introduction

Small bowel tumours (SBT) present with vague abdominal symptoms.<sup>1</sup> The development of the double balloon endoscopy (DBE) has made it feasible to examine the small intestine. The inability to palpate SBT during laparoscopic surgery makes it difficult to locate tumours, a critical aspect of the minimally invasive approach, as it is in colorectal surgery.<sup>2</sup> Endoscopic tattoo has been used for localization of tumours in colonic surgery.<sup>3</sup> The literature on DBE tattoo is limited.<sup>4</sup> We present a rare case of small bowel tumour which was demarcated with the use of double balloon endoscopic tattooing for the precise intraoperative localization of the lesion.

## Case report

A 67 years old man presented with a medical history of unexplained iron deficiency anaemia for 30 years. In last few months he had symptoms of anaemia as fatigue, dizziness, shortness of breath and without any strength for physical activity. The gastrointestinal (GI) symptoms at presentation

included an episode of upper abdominal pain and loose stools. Physical examination showed no abnormal findings. He was receiving treatment for hypertension and gastroesophageal reflux disease. He has been taking acetylsalicylic acid (aspirin®) for unknown reasons. Earlier examinations included upper GI endoscopy and colonoscopy to reveal the source of occult bleeding. Upper GI endoscopy showed a hiatus hernia. He was initially treated with blood transfusions and iron tablets.

His haemoglobin was 4.6 mmol/l (7.4 g/dl) and was therefore admitted for transfusion and further evaluation. The treatment with aspirin was discontinued and the patient underwent an upper GI endoscopy and colonoscopy; both the procedures were normal. Subsequent investigation with capsule endoscopy (CE) showed a lesion suggestive of a tumour in the ileum. An anal-route DBE showed a large

*Reprints requests and correspondence:*

Nina Abild, Department of Surgical Gastroenterology, Køge Hospital, Lykkebækvej 1, 4600 Køge Denmark  
Telephone: +45 53662120; Fax: +45;  
E-mail: abild.nina@gmail.com

ulcerative polypoid tumour in the distal ileum. An endoscopic tattooing with dye injection, SPOT (GI supply, Camp Hill, Pennsylvania, USA) was performed distal to the tumour and 0.5 -1.0 ml dye was injected at four sites circumferentially to improve perioperative visualization (Figure 1). Magnetic resonance imaging (MRI) showed thickening of the wall in ileum placed in the right lower quadrant. Positron emission computed tomography (PET-CT) showed no sign of metastasis. The lesion was easily identified during the surgical procedure and a segment of small bowel containing the tumor, was resected (Figure 2). Final pathological diagnosis was an inflammatory vascular polyp without malignancy.



**Figure 1:** The little arrow marks the localization of the small bowel tumor. The large arrow marks the area of the endoscopic tattoo.



**Figure 2:** The resected small bowel. The lesion could be easily identified following the preoperative endoscopic tattoo (arrow).

## Discussion

Occult gastrointestinal bleeding (OGIB), chronic abdominal pain, diarrhoea and/ or obstruction are the nonspecific clinical symptoms of SBT.<sup>1</sup> The SBT account for 1-5% of all gastrointestinal neoplasms;<sup>5</sup> 64% are malignant.<sup>3</sup> The vague nonspecific symptoms are indications of CE and DBE when routine diagnostic imaging and endoscopic examinations do not offer a rational explanation of the symptoms.

In the last decade CE was introduced as a non-invasive method to visualize the small intestine with high diagnostic benefits.<sup>1</sup> DBE was introduced in 2001 by Yamamoto H, *et al*.<sup>6</sup> DBE allows obtaining biopsy specimens for histopathological diagnosis and endoscopic tattooing prior to surgery. Capsule retention can reach 9-25% in patients with small bowel tumours in the intestinal canal.<sup>1</sup> DBE is a more practical modality than CE for patients with suspicion of SBT, including patients with stenotic symptoms. CE is now primarily used for the selection of patients for DBE and also to choose the primary access (oral or anal) for DBE. The DBE has been associated with a few serious complications such as pancreatitis and perforation.<sup>5,6</sup>

The exact location of the tumour is crucial for undertaking minimal invasive surgery. This can be difficult because of the lack of tactile sensation and if size of lesion is small. Surgery time may be prolonged if the tumour site is doubtful, and the potential risk of complications increases. Endoscopic SPOT make the surgeon certain of the exact tumour site and reduces the risk of removal of the wrong segment of the small intestine.<sup>3,7</sup> Numerous methods for identifying the tumour location have been used in colorectal surgery. Cho *et al*<sup>2</sup> found the accuracy of tumour localization was very similar by: colonoscopy (88.7%), barium enema (93.3%), CT colono-graphy (94.7%), endoscopic tattooing (97.9%) and intra-operative colonoscopy (100%).

The colonoscopic tattooing has been a safe and effective method, which can be performed in the initial endoscopy and has been used for many years.<sup>3</sup> Traditional tattooing of the colon wall involves injecting dye directly into the colonic wall a few centimetres distal from the lesion to avoid the risk of tumour seeding. The risk of clinical complications has been stated to be less than 1%.<sup>2,3</sup> Few tattoo-induced perforation leading to peritonitis and abscess formation, fat necrosis and inflammatory pseudo tumour, are reported. Follow up biopsies of the tattooed areas have shown inflammatory changes and no evidence of dysplasia or malignant change.<sup>3</sup>

To date limited data is published about endoscopic tattooing in the small intestine. Lee MH *et al*, reported a case with a 62 years old woman with a history of chronic anaemia and chronic renal insufficiency. They used an anal route DBE to identify and mark a small bowel tumour for the subsequent operation.<sup>4</sup> With the advent of capsule endoscopy or enteroscopy, the preoperative diagnosis of SBTs have increased. The performance of minimal invasive surgery requires the accurate preoperative localization of the lesion.

This case indicates that preoperative endoscopic tattooing is a safe, highly effective method for precise localization of small bowel tumours. DBE tattooing can help avoid extended surgery time with perioperative endoscopy and it can also prevent resection of the wrong segment of the small bowel.

## Conclusion

We describe a long-standing case of iron deficiency anaemia caused by inflammatory vascular polyp in distal ileum. The lesion was successfully localized and tattooed by the use of DBE. No complication occurred. Our experience demonstrates the clinical utility of DBE tattooing to permit the intraoperative localization of small bowel tumours.

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