

The importance of upper gastrointestinal lesions detected with capsule endoscopy in patients with obscure digestive bleeding

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Abstract

Study aims : Small bowel capsule endoscopy (SBCE) is the first line procedure for detecting small bowel lesions in patients with an obscure gastrointestinal bleeding (OGIB). Missed upper gastrointestinal (UGI) lesions at the initial endoscopy may account for the so-called OGIB. This retrospective study was designed to assess the role of SBCE in detecting missed UGI lesions.

Methods : All consecutive SBCE that were performed in the last year for patients with OGIB were included in our study. We evaluated the visibility of the gastric mucosa, the anatomic landmarks, the presence of UGI lesions as well as their clinical importance. The SBCE findings were compared with the reports of previous UGI endoscopies.

Results : 118 patients (45 males, 73 females, mean age 61 ± 19 years) were included in the analysis. The indication for SBCE was obscure overt and occult OGIB in 60 and in 58 patients, respectively. SBCE identified lesions in the small bowel in 42% of the patients. An excellent visibility of gastric mucosa was observed in 83/118 cases (70.3%). SBCE identified gastric lesions with potential clinical significance (high bleed potential) in 25/118 (21.2%) patients. In 12/118 (10.2%) patients the UGI lesions detected by SBCE were considered as the only potential source of bleeding.

Conclusions : In patients with OGIB, SBCE detected not only small bowel lesions but also significant UGI lesions that were missed or underestimated at the initial endoscopy in 21% of cases. It is therefore necessary to carefully read the gastric images when performing an SBCE. (*Acta gastroenterol. belg.*, 2011, 74, 395-399).

Key words : occult bleeding, gastric lesions, small bowel lesions.

Introduction

Obscure gastrointestinal bleeding (OGIB) is defined as a persistent or recurrent gastrointestinal bleeding while the conventional endoscopic exams (oesophagogastroduodenoscopy – OGD and colonoscopy) remain inconclusive for detecting the source of bleeding (1-3). According to the clinical presentation OGIB is defined as overt (presence of melaena and/or haematochezia) or occult (anaemia and/or positive faecal occult blood test). Gastrointestinal bleeding is classified as obscure in approximately 5% of all bleeding cases and the cause is usually a small bowel lesion ; the most frequent findings being angioectasias, tumours and mucosal breaks – ulcerations or erosions. Such digestive bleeding is now classified as a mid-gastrointestinal bleeding (3,4). Many prospective studies comparing the videocapsule to the push enteroscopy confirmed the higher diagnostic accuracy of SBCE in patients with OGIB (5). The diagnostic yield of SBCE ranges from 38% to 83% and is higher in

ongoing overt than in occult and previous overt bleeding (6,7). With combination of oral and anal approaches, the yield of double balloon enteroscopy (DBE) is similar than that of CE but DBE is more devoted to therapeutic enteroscopy (8). SBCE has a high negative predictive value (9-11) and is the first line method in the standard algorithm for OGIB cases possibly followed by one of the therapeutic enteroscopy methods that are now available, conservative treatment or surgery (12,13).

However, it has been shown that in some cases of so-called OGIB, the source of bleeding may be upper or lower GI lesions previously missed or underestimated at the initial endoscopic evaluation (14,15) but the role of SBCE on defining these lesions has not been evaluated.

Indeed, although SBCE has been conceived to explore the small bowel, it also provides quality images of the oesophagus and the stomach recorded before the passage of the pylorus by the capsule.

This retrospective, multicenter study evaluated the clinical ability of SBCE in identifying the UGI lesions (in stomach and oesophagus) as the potential source of gastrointestinal bleeding in patients investigated for OGIB.

Patients and methods

This study was designed as a retrospective analysis of all consecutive capsule endoscopies that have been performed during the last year in the Endoscopy Units in Erasme University Hospital (Brussels) and in the University Hospital in Hradec Kralove for patients presenting as OGIB. OGIB was defined as persistent or recurrent digestive bleeding with no detectable source after having performed oesogastroduodenoscopy and colonoscopy. OGIB was characterised as overt (presence of melena or hematochezia) or occult (iron-deficient with positive faecal occult blood testing (FOBT)). In all patients, SBCE was performed within 15 days after initial UGI endoscopy.

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Table 1. — SBCE findings in upper GI tract

Case	Indication 1 : obscure occult, 2 : obscure overt GI bleeding	CE findings in upper GI tract	SBCE findings in the small bowel	Visibility (gastric mucosa) 1 : good 2 : limited 3 : poor
1	2	haemorrhagic erosions (body)	0	1
7	1	haemorrhagic erosions (antrum)	melena in the ileum	2
12	1	haemorrhagic erosions (body)	small bowel varices	2
14	1	portal gastropathy, blood	0	2
17	2	haemorrhagic erosions (body)	0	2
21	1	angiectasia (body)	melena in the ileum	2
24	1	portal gastropathy	0	1
33	1	antral ulcer	ulcerated tumour in jejunum	1
40	1	hemorrhagic erosions (body), blood	ischemic enteritis, fresh blood in ileum	2
43	1	blood, haemorrhagic erosions (antrum)	0	2
48	1	blood in antrum	fresh blood in duodenum	2
64	2	GAVE	0	1
65	1	Cameron ulcer	0	1
68	2	haemorrhagic erosions	0	1
72	2	haemorrhagic erosions	0	1
73	1	haemorrhagic erosions (antrum)	0	2
75	2	small antral ucers	0	2
80	1	haemorrhagic erosions	red spot ileum	1
82	1	haemorrhagic erosions	fresh blood and submucosal tumour in ileum	1
83	2	erosions in antrum	susp.submucosal tumour in ileum (lipoma ?)	1
87	2	portal hypertensive gastropathy	0	1
88	2	portal hypertensive gastropathy	angiectasia in the jejunum	1
98	1	angiectasia (body)	angiectasias in duodenum and jejunum	1
99	2	erosions (antrum)	0	1
105	1	erosions	0	1

The SBCE recordings (Given Imaging, Yoqneam, Israel or Olympus, Tokyo, Japan) were reviewed by 2 endoscopists (I.T. and AVG) experienced in SB video capsule (more than 300 exams) who focused on images at the level of the oesophagus and the stomach. Only patients with previously documented gastroparesia received a prokinetic (Domperidone 10 mg or Metoclopramide 10 mg) 10 minutes before the ingestion of the capsule.

For each recording the readers described the following items : anatomical landmarks (Z line, first gastric image, pylorus, gastric body, antrum) ; visibility of the gastric mucosal wall was scored as good, fair (some remaining liquid) or poor (liquid plus food residues).

Upper GI CE findings were scored as having a intermediate bleed potential (superficial mucosal erosions or red spots) or high bleeding potential (hemorrhagic erosions, ulcer, varices, angioectasias, GAVE, tumours, blood or clots) as described by Saurin *et al.* (16). Lesions were considered as the only source of bleeding after

therapeutic intervention (medical and /or endoscopic) and discontinuation of bleeding. The use of anti inflammatory drugs (NSAIDs), anticoagulant or anti-platelet drugs within one month before the procedures were recorded.

The gastric time release (from ingestion to passage through the pylorus) was determined for each patient. The SBCE findings were compared to the report of the initial oesogastroduodenoscopy.

Lesions that were detected in the SBCE were rechecked at a second reading.

Regarding small bowel lesions and the description of UGI findings, the readers evaluated the percentage of UGI lesions that could have been responsible for the digestive bleeding.

Results

One hundred eighteen patients (45 males, 73 females with a mean age of 61 ± 19 years) were included in this

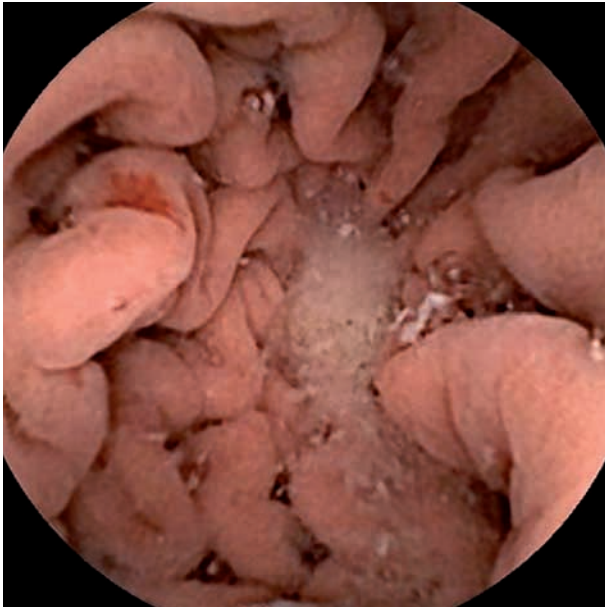


Fig. 1. — Gastric angioectasia



Fig. 3. — Prepyloric ulceration

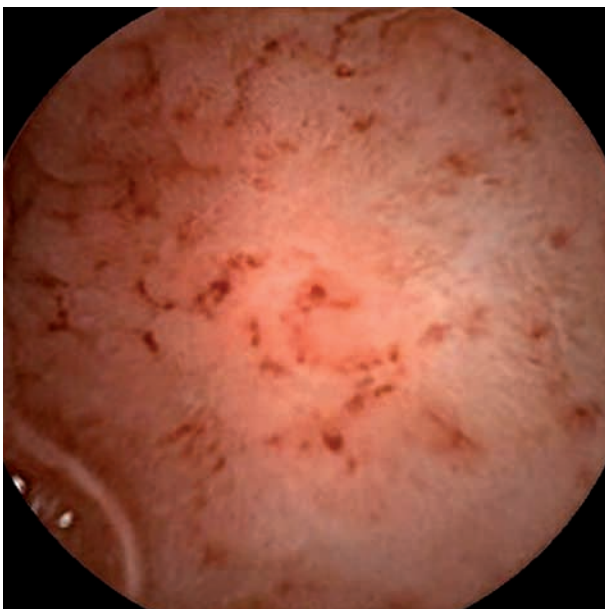


Fig. 2. — Erosive gastritis

study. The indications for performing SBCE were overt OGIB in 60 patients (melena in 53 and hematochezia in 7 patients) and occult in 58 patients, respectively.

SBCE identified small bowel lesions in 50 patients (42.2%). The median gastric time release was 26 (range 1 to 131) minutes. Only 17 out of 118 patients received a prokinetic drug.

Regarding the anatomical landmarks, the Z line was visualized in 19 patients (16.1%), and the pylorus in 108 out of 118 patients (91.5%).

Reflux oesophagitis (linear erosions), suspected Barrett oesophagus (tongues with cylindrical epithelium) and an axial hiatal hernia were described in only 3 patients.

The visibility of the gastric mucosa was considered good in 83 patients (71%), fair in 29 patients (24%) and poor in 6 patients (5%). There was no significant correlation between the gastric time release, the use of a prokinetic drug and the grade of visibility of the gastric mucosa.

Gastric lesions were visualized in 44 patients (37%) and were considered as significant (potentially hemorrhagic) in 25 of them (21%). These gastric lesions included hemorrhagic erosions in 15 patients (12%), blood or clots in 4 (3.4%), portal hypertensive gastropathy and antral vascular ectasia (GAVE) in 3 (2.5%), antral ulcers in 2 (1.7%) and longitudinal Cameron ulcerations in 1 (0.9%), respectively (Figs. 1-5).

Amongst the 25 patients in whom a significant gastric lesion was detected, 15 (60%) presented an overt OGIB and 10 (40%) an occult bleeding (NS). The number of potential bleed lesions was higher in patients having received NSAIDs ($n = 14$) but failed to reach a significant difference in this cohort of patients.

The significant (potentially hemorrhagic) lesions were located in the gastric body in 6 (24%), in the antrum in 8 (32%) and in both sites in 11 patients (44%). In only 7 cases simultaneous lesion were observed in both the UGI tract and the small bowel but without a common aetiology. These lesions that were detected by SB capsule in the UGI tract were missed or underestimated at the initial UGI endoscopy in 20 out of 25 patients. They were subsequently considered as the only source of bleeding in 12 out of 118 patients (10%).



Fig. 4. — Haemorrhagic gastritis



Fig. 5. — Antrum GAVE lesions

Discussion

SBCE is a safe and well tolerated method exploring the small bowel in patients presenting OGIB (overt or occult) with a high diagnostic accuracy. In our study SBCE was effective detecting small bowel lesions in 42.4% of the patients with an OGIB ; we also observed that SBCE may detect UGI lesions that were missed or underestimated at the initial endoscopy. Considering the severity of the gastric lesions and the lesions described inside the small bowel, UGI lesions detected by means of capsule endoscopy were identified as the source of bleeding in 10% of all cases.

The SBCE has been designed for exploring the small bowel (17). The quick passage of capsule through the oesophagus limits the extent of visualized mucosa to a few single pictures from distal oesophagus ; the Z line being rarely pictured (16.1% in our study). The identification of the oesophageal pathology is therefore rare and the use of standard small bowel capsule for adequate oesophageal investigation cannot be recommended. A special oesophageal capsule with a camera at both ends has been developed for examining the oesophagus formerly with a good sensitivity but limited clinical value(18). It is interesting to underline that it has been reported that the colon capsule which also has a camera at both ends allows good visualization of the lower oesophagus (19).

In our series, gastric lesions were observed in 37% of patients and were considered as significant in 21% of them. Most of these lesions were described in the vertical body or in the antrum underlining the limitations of the SBCE for examining the upper fundus as well as the cardia region. On the contrary, the pylorus and prepyloric area were regularly observed in most cases

(91.5%). Important factors worsening the visibility are the absence of gastric distension and the presence of gastric residues despite overnight fasting in about one third of our patients (35/118). Fortunately, the large amount of gastric content precluding the mucosal visualization was observed in only 6/118 patients and the average gastric emptying time of 26 minutes represents enough time for the precise investigation of visualized parts of the mucosa.

Despite the described limitations of SBCE in the upper GI tract, the stomach was adequately visualized in the majority of cases allowing to identify a significant proportion of missed or underestimated lesions (17%), comparable with previously reported data. Noteworthy, these previous observations were made using push enteroscopy performed in second line after an initial negative UGI endoscopy which detected missed or unreported UGI lesions in 10 to 15% of the patients referred for OGIB (14,20,21). A few studies already reported that SBCE is valuable for detecting bleeding lesions not only in the small bowel but also in the UGI tract as well as in the colon (15,22,23,24). We observed no statistically significant differences in the number of potentially hemorrhagic gastric findings detected during SBCE in patients presented with obscure overt (15/25) or occult (10/25) OGIB despite some previously published data.

In case of OGIB with initial negative UGI endoscopy, it is not recommended to systematically repeat a second look endoscopy. However it should be done in patients for whom the initial UGI endoscopy was not totally reliable (absence of videodocumentation, retroversion or deep duodenal intubation, large amount of gastric fluid with residues or blood limiting investigation). Performing a second look UGI endoscopy could prevent

unnecessary SBCE in these patients. Alternatively, a careful reading of the upper GI phase could avoid the need for repeating endoscopies.

Our observations also raised the question of equipping the SBCE with a camera at both ends. Some preliminary trials have shown a higher diagnostic accuracy (25). Such a newly designed capsule could probably increase the detection rate of UGI lesions. In the future we may expect a capsule exploring the whole gut with a double camera and a variable number of images depending on the speed of the progression as it is now available for colon investigation as the colon capsule 2 (26). Limitations of the present study are : 1/ its retrospective study design 2/ a prospective long term follow-up is mandatory for confirming that the so-called potentially hemorrhagic lesions are really responsible for bleeding after an adapted therapeutic intervention.

In conclusion our data confirms the high prevalence of UGI lesions in patients presenting an OGIB. Therefore, history of drugs intake is important. This also highlights the importance of carefully assessing the quality of the initial OGD and demonstrates that it is mandatory to carefully read the oesophageal and gastric phase of the recordings even if the SB capsule is done for exploring the small bowel.

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