

## Does Intraoperative Endoscopy Still Apply in Obscure Gastrointestinal Bleeding Treatment? A Case Report and a Literature Review with a Diagnostic Algorithm Proposal

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### Abstract

**Background:** Obscure gastrointestinal bleeding seems to be important problem affecting increasing group of patients. Due to its localization and mild symptoms investigation is difficult and usually requires advanced procedures. Unfortunately, it is often impossible to show precisely a source of bleeding what delays treatment and can cause severe bleeding.

**Methods:** We describe a case report of the patient who refused surgical treatment despite proper bleeding localization by enteral capsule what caused serious bleeding few months later. Patient was operated on duty intraoperative endoscopy was necessary to perform. After treatment he left hospital in a good condition without any negative consequences.

**Discussion:** Authors discussed investigation methods, a role of endoscopy performed intraoperatively and propose a scheme helpful during obscure bleeding investigation.

**Keywords:** Gastrointestinal bleeding; Investigation; Endoscopy; Operation

### Introduction

Obscure gastrointestinal bleeding (OGIB) is a diagnostic challenge and seems to be an increasing problem of health care professional. It might be responsible even for 2% to 10% of all gastrointestinal (GI) bleeding cases, usually is asymptomatic and almost always recurrent [1-4]. Investigation is difficult, up to 80% of pathologies responsible for OGIB is localized in a small bowel but its visualization by endoscopy or radiology is technically limited unfortunately [4,5]. OGIB is defined as bleeding from gastrointestinal tract that persists and recurs without an obvious etiology after an initial evaluation using endoscopy and imaging with a small bowel radiography [6]. Up to 74% of cases OGIB manifestation is bloody or coffee-ground vomits, melaena and hematochezia. Latent OGIB accounts about 26% cases and causes positive fecal blood occult test or/and syderopenic anemia. About 50% of obscure bleeding stops spontaneously, medium age of patients suffering from OGIB is 59-66 years, correlation with sex was not confirmed [2,3,7,8]. We report a case of patient with obscure gastrointestinal bleeding who refused surgical treatment at the time of diagnosis and got recurrent bleeding requiring urgent operation and intraoperative endoscopic investigation.

### Case Report

A 68-years old patient, suffering from hypertension, ischemic heart disease, chronic renal failure and atherosclerosis obliterans was admitted to the Department of Surgery on duty because of severe gastrointestinal bleeding symptoms. Patient's medical records history revealed hospitalization because of GI bleeding episode with 10 packed red blood cell (PRBC) units transfusion about 2 years before. During previous hospital investigation, after bleeding stopped, there was performed colonoscopy with negative results and enteral capsule which showed small lesion in ileum. Unfortunately, with no symptoms and good feeling, patient refused surgical treatment it these days. After discharge he had history of positive fecal blood occult, episodes of melaena and hematochezia for last two years. Two weeks before current admission patient got spontaneous GI bleeding with an

increasing weakening for last days. On admission he was in quite good condition, with no pain and active bleeding signs, with melena in rectal examination. Laboratory tests revealed high grade anemia (Hb 7.5 g/dl) and renal insufficiency (creatinine 2.05 mg/dl), with no coagulopathy signs. Intravenous fluids were prescribed, he got two units of packed red blood cell and two fresh frozen plasma (FFP) units also. Computer tomography with intravenous contrast showed active bleeding in ileum with no possibility of definitive radiologic treatment (Figures 1 and 2). Patient was qualified to emergency laparotomy. During operation there were enlarged jejunum and ileum noted with intraluminal blood presence. No abnormalities were found on small and large bowel palpation. Intraoperative endoscopy of upper GI tract and small bowel was performed and showed few places in distal bowel which possibly could be responsible for past bleeding and one ileum lesion with active bleeding. All suspected findings were marked with sutures and about 50 cm segment of ileum was resected. In postoperative period delayed ileal motoric function was noted, patient was treated with parenteral and enteral nutrition later. After 3 weeks hospitalization patient was discharged in good condition. Histopathological investigation revealed a few malformations and enlarged blood vessels in submucosa (Figures 3 and 4).

### Discussion

Small bowel lesions are responsible for GI bleeding only in 2% to

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Received October 31, 2017; Accepted December 13, 2017; Published December 18, 2017

**Citation:** Guzel T, Kowalczyk E, Korcz W, Pertkiewicz J, Mazurkiewicz M, et al. (2017) Does Intraoperative Endoscopy Still Apply in Obscure Gastrointestinal Bleeding Treatment? A Case Report and a Literature Review with a Diagnostic Algorithm Proposal. J Clin Case Rep 7: 1054. doi: [10.4172/2165-7920.10001054](https://doi.org/10.4172/2165-7920.10001054)

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10%. On the other hand, up to 80% of obscure GI bleeding is localized in a small bowel [2,7]. Medical terminology of GI is unfortunately not homogenous [5,9]. Yano et al. proposed 4 groups of small bowel lesions what was shown in Table 1 [5,10]. The most common reason of bleeding is angiodysplasia, in 40% to 60% cases there are more than one bowel

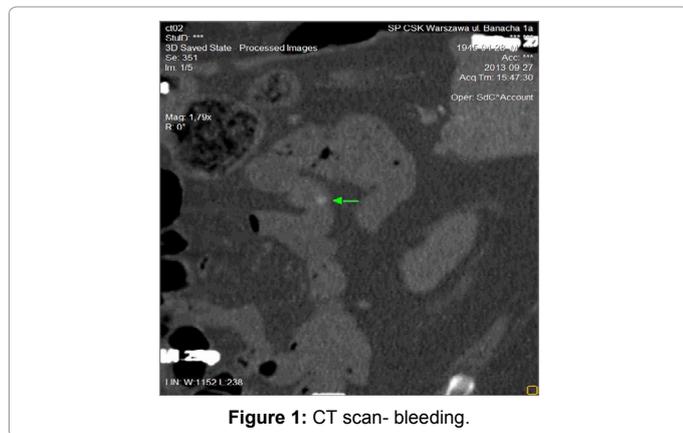


Figure 1: CT scan- bleeding.

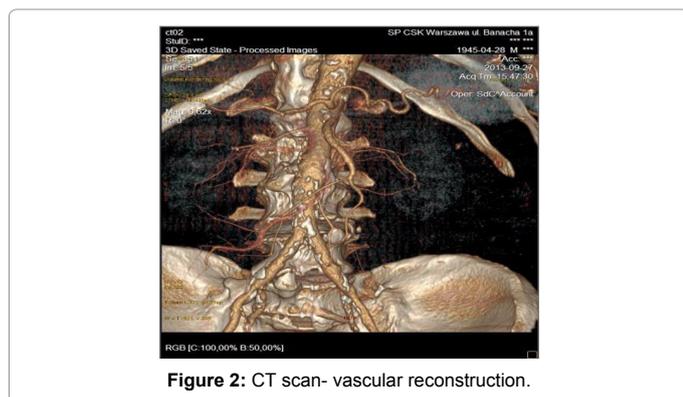


Figure 2: CT scan- vascular reconstruction.

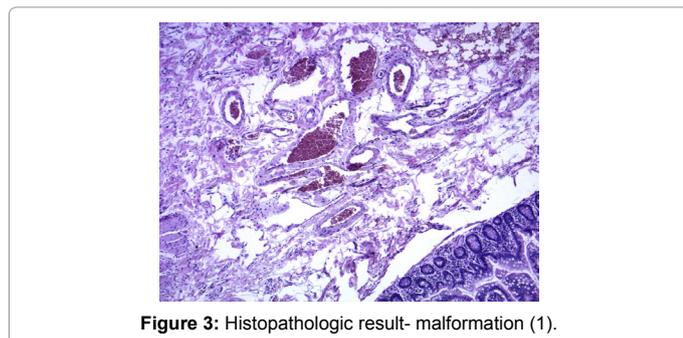


Figure 3: Histopathologic result- malformation (1).

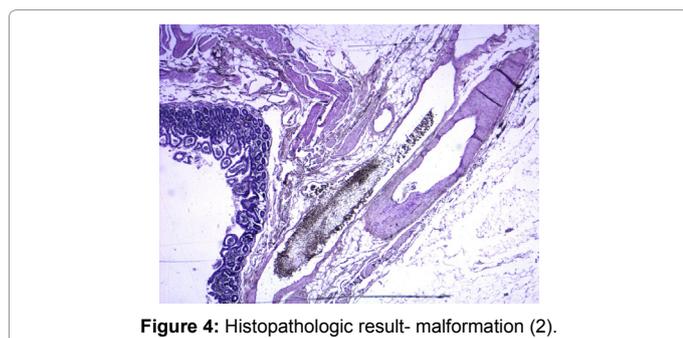


Figure 4: Histopathologic result- malformation (2).

Lesion Category	Endoscopic Description	Pathologic Correlate	Incidence (%)
Types 1a and 1b	Punctate (1a) or patchy (1b) erythema with or without oozing	Angioectasia	91
Types 2a and 2b	Punctate lesions with pulsatile bleeding (2a) or pulsatile red protrusion without surrounding venous distention (2b)	Dieulafoy lesions	4
Type 3	Pulsatile red protrusion with surrounding venous dilatation	Arteriovenous malformation	4
Type 4	Others lesions not classified into any other category	All others	1

Table 1: Endoscopic classification of small bowel lesions.

Reason	Count (%)
Small bowel angiodysplasia	32% to 61% [1,2,4,5,10,12,14]
Arteriovenous malformation (AVM)	9,1% [5]
Ulceration	85 to 14,7% [1,4,5]
Small bowel tumors	45 to 20% [1,4,5,14]
Cameron erosion	5% to 15% [14]
Upper GI tract angiodysplasia	45 to 10% [11,14]
Crohn's disease	2% to 10% [14]
Small bowel diverticula	3,3% to 5% [1,5,14]
Colon dysplasia	2% to 4% [5]
Varices haemorrhoidalis	0,4% to 5% [4,5,14]
Dieulafoy lesions	0,4% to 3,5% [5,12,14]
Unknown	16% to 20,7% [1,5]

Table 2: Reasons of GI bleeding according to literature.

GI bleeding according to age		
>65 years old	41-64 years old	<40 years old
Vascular pathologies 54%	Vascular pathologies 35%	Crohn's disease 35%
Small bowel ulcer 13%	Small bowel neoplasm 31%	Small bowel neoplasm 24%
Small bowel neoplasm 12%	Inflammatory bowel disease 10%	Inflammatory bowel disease 11%

Table 3: Pathologies responsible for GI bleeding according to age.

lesion and in 20% cases lesions are disseminated in gastrointestinal tract [8,9]. Endoscopic manifestation of angiodysplasia is a small (2-10 mm) flush area with persistent contact bleeding. In histological pictures it is showed as a thin winding mucosal and submucosal veins with no capillaries. It can be caused by age vessel degeneration with precapillaries sphincter dysfunction and pathological anastomoses [5]. Other reasons were presented in Table 2 [1,2,4,5,10-14]. Group of rare reason of GI bleeding accounting less than 0,5% are: hamartoma, hemangioma, Rendu-Osler-Weber disease, fistulas, radiotherapy dependent lesions, amyloidosis, Schönlein-Henoch disease, hypertension related enteropathy, ileal melanoma, B-cell lymphoma [3,11]. A very rare reason can be Heyde's syndrome which is coincidence of aortic valve stenosis and bleeding from angiodysplasia [8]. Concerning the age, in young people there is predomination of inflammatory bowel disease and neoplasm, in elderlies rather vascular pathologies are responsible for GI bleeding (Table 3) (Figures 5 and 6) [12]. In our patient, aged 68-years old, there were confirmed vascular malformations as a reason of bleeding, with no other pathologies of gastrointestinal tract. Small bowel is sometimes called „the dark continent of the gastrointestinal tract” because of its intraperitoneal localization with free mobility that makes endoscopic investigation very difficult [1,11,12]. According to literature medium time from first signs of obscure bleeding to diagnosis is 18-26 months. In such group of patients, statistically, 10 medical procedures are performed, 3,5 hospitalization occur and in 73% to 78%

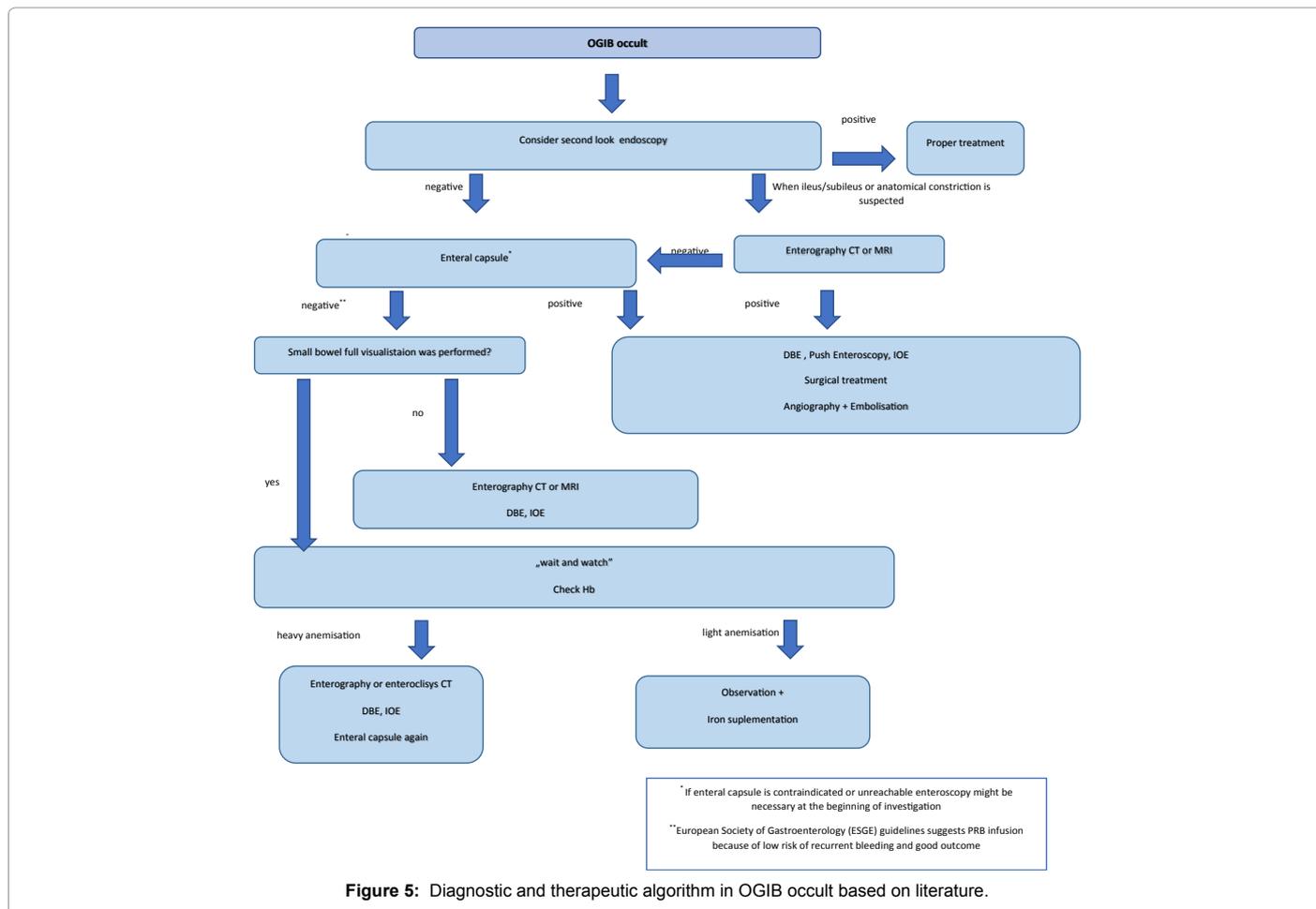


Figure 5: Diagnostic and therapeutic algorithm in OGIB occult based on literature.

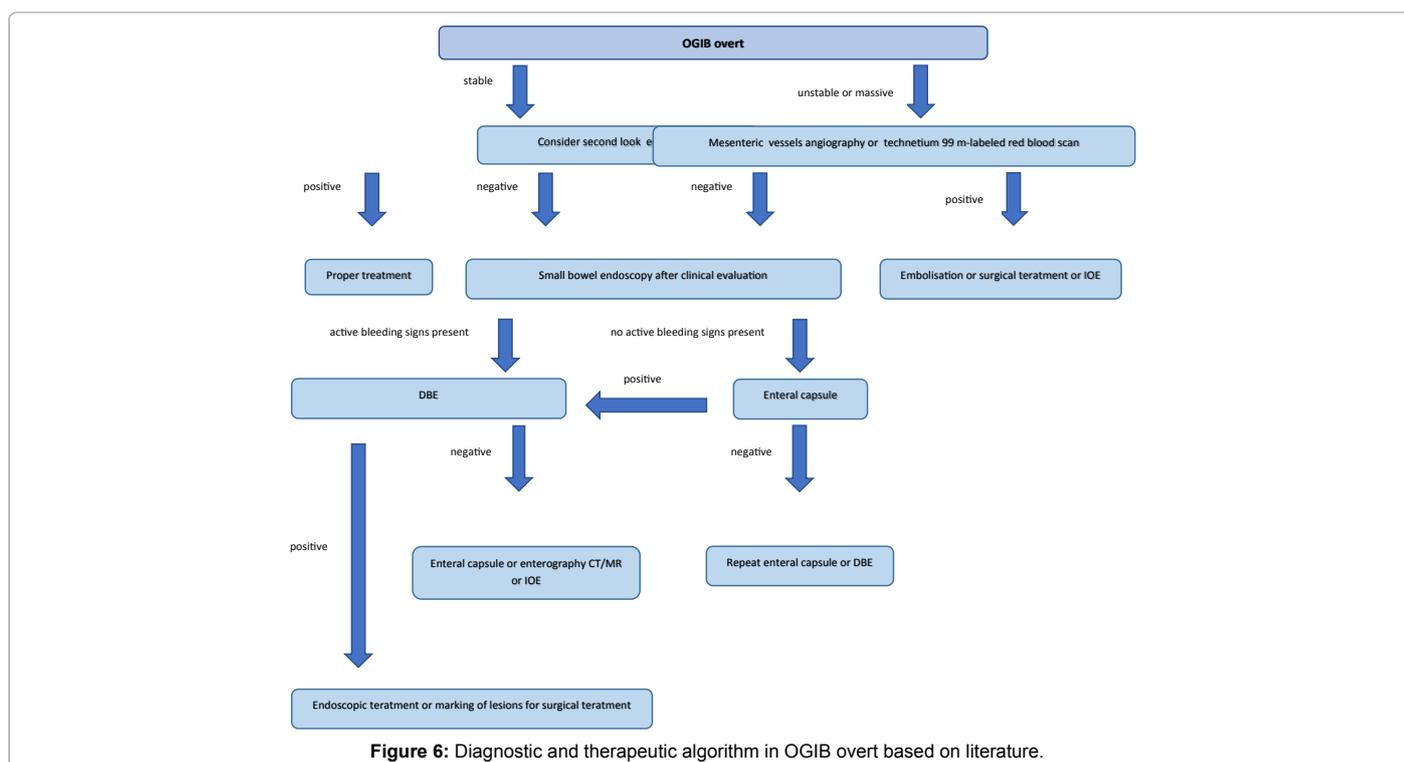


Figure 6: Diagnostic and therapeutic algorithm in OGIB overt based on literature.

of cases transfusion of PRBC and FFP units is required [1,3,7]. It is discussed whether repeated endoscopy after failed first investigation is indicated because it was proven that it is not efficient enough and it enables visualization of only 3.5% to 5% of lesions responsible for bleeding. Despite this, second look should be considered in case of active bleeding or after poor visualization of stomach fundus or colon during first procedure [4,7]. As there are no existing homogenous guidelines of investigation in case of OGIB, we propose diagnostic algorithm based on literature and depending on clinical situation (Figures 1 and 2) [4,11]. Conventional radiological methods as computer tomography and/or magnetic resonance, with their sensitivity up to 6% to 7% are usually not helpful in OGIB investigation. Angiography and technetium 99 m-labeled red blood cell nuclear scan, with adequate sensitivity 34% to 56% and 51% is helpful only in active bleeding at a rate of contrast flow more than 0.5 ml/min. Enterography or enteroclysis CT/MR, with sensitivity of 21% to 30%, might be useful especially when inflammation or neoplasm is responsible for GI bleeding. These radiological methods of imaging enable to show real time bowel functionality and bowel wall surface with some discrete lesions [4,13]. First choice investigation in OGIB in stable condition patients should be enteral videocapsule. It is safe, effective and comfortable for the patient. In most cases (66% to 100%), with sensitivity 47% to 95% and specificity 75% to 95%, capsule enables visualization of small bowel mucosa with small lesions [3,4]. High sensitivity of capsule investigation achieving 60,5% was confirmed by Teshima et al. [14]. who reported 23000 capsule procedures performed in group of patients in 66% suffering from OGIB [14]. In comparison to other methods only invasive double-balloon endoscopy (DBE) and intraoperative endoscopy (IOE) are similar with such high sensitivity [4]. Effectiveness of enteral capsule is the highest with active bleeding - up to 86,9% to 100% and about 44,2% to 69,2% for obscure bleeding [3,4]. The sooner after active bleeding capsule is apply the better result is possible to achieve. Delay in investigation shouldn't be more than 10-14 days after bleeding because of decreasing sensitivity of the method [1,4,14]. There is no possibility to take samples or make any intervention during investigation. There is also a risk of ileus caused by capsule fixing which is estimated for about 1,4%. Contraindications for this method are: ileus, Zenker's diverticulum, active Crohn's disease, age below 10 years old [3]. After negative capsule investigation risk of recurrent bleeding is estimated for about 5% to 11%, some authors indicate even on 35% [4,13]. Complementary method to enteral capsule is double balloon enteroscopy (DBE). DBE is indicated in cases of negative capsule result or after positive capsule investigation to resect lesions. Sensitivity of DBE is 100% for active bleeding and 42,1% for obscure bleeding, with median 55% to 75% based on literature [4,14]. Depending on time, the effectiveness is 90% to 100% till 24 hours and 70% till 72 hours after bleeding [14]. DBE is an extended procedure, it takes about 100 minutes and requires experienced investigator because of its technical difficulty. Complete procedure is possible to achieve in 86% of patients. Complications are: bleeding (0,8%), perforation (0,4%), acute pancreatitis (0,3%) and accounts up to 1,5% of cases [14]. Recurrence rate after DBE is respectively 23% to 35% within 12 months follow-up, 41% within 30 months follow-up and about 50% for patients after active bleeding within 30-55 months follow-up and depends on patient's age, PRBC transfusion, count of lesions in bowel, arrhythmia and valve insufficiency presence [14]. Push enteroscopy is an endoscopic method of visualization and treatment of small bowel by using colonoscopy in upper gastrointestinal tract. It enables visualization of 50-150 cm of small bowel, with sensitivity about 15% to 53%. Push enteroscopy is easy to perform even in a small diagnostic centers/hospitals, gives possibility of intervention such as small resection, coagulation or lesion

marking. Complication rate is low, most common are duodenum perforation and acute pancreatitis [11,14]. Another endoscopic method of investigation, with sensitivity of 65% to 100%, is an intraoperative endoscopy (IOE). It was performed in presented patient's case during emergency operation because of bleeding. Despite positive radiologic result there was no technical possibilities of intravenous intervention and urgent operation was required. Even during laparotomy assessment of bowel mucosa can be difficult as usually there is free blood inside. Also, endoscopic bowel penetration in open abdomen, even with hand assisting, is at high risk of perforation. Indications for this procedure are very restricted because of its highly invasive nature and is applied as a last choice method [3,12]. IOE enables mucosa visualization in 57% to 100% of cases and bowel resection during the same operation. Therapeutic index, which is identification of problem and elective treatment at once, is 55% to 78% for the procedure [2,7,11,15]. In the literature mortality rate related to IOE accounts for 2% to 18% of patients, recurrence rate is assessed for 25% to 60% [2,11]. Main negative consequence of IOE is persistent ileus occurring in up to 46% of patients, often requiring parenteral nutrition. Our patient required parenteral nutrition for 12 days and enteral nutrition for 6 days before he tolerated oral diet. Pharmacological treatment of OGIB applies somatostatin analogs to stop angiogenesis, reduce visceral flow and increase platelet aggregation. Meta-analysis made by Jackson et al. showed that octreotide intake within 1-2 years after bleeding reduces risk of recurrence rate for about 22% in the first year and about 32% in the second year of follow-up. Satisfactory results were published for thalidomide and vascular endothelial growth factor inhibitor (VEGF), that reduced recurrence rate even up to 71% after 1-year intake in group of patients with vessel malformation [8].

## Conclusion

OGIB, due to its increasing morbidity and still difficulties in investigation demanding diagnosis, represents one of the most challenging disorders. There is still no clear diagnostic algorithm, so the patients are at high risk of extending investigation and treatment failure. We propose enteral capsule as a method of the first choice and intraoperative endoscopy as a last choice method in selected cases. In presented case report, after proper diagnosis, refusal of surgical treatment caused life threatening complication. It should be highly recommended to complete elective treatment after diagnosis. Because of recurrent nature of OGIB, patients should remain under permanent medical supervision in highly specialized centres.

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