REVISTA ESPAÑOLA DE
ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

Title:
The rebleeding rate in patients evaluated for obscure gastrointestinal bleeding after negative small bowel findings by device assisted enteroscopy

Authors:
Catarina Gomes, José María Rubio Mateos, Rolando Taveira Pinho, Ana Ponte, Adélia Rodrigues, Margarita Fosado Gayosso, Pilar Esteban Delgado, João Carlos Silva, Edgar Afecto, João Carvalho

DOI: 10.17235/reed.2020.6833/2019
Link: PubMed (Epub ahead of print)

Please cite this article as:
Gomes Catarina, Rubio Mateos José María, Pinho Rolando Taveira, Ponte Ana, Rodrigues Adélia, Fosado Gayosso Margarita , Esteban Delgado Pilar, Silva João Carlos, Afecto Edgar, Carvalho João. The rebleeding rate in patients evaluated for obscure gastrointestinal bleeding after negative small bowel findings by device assisted enteroscopy. Rev Esp Enferm Dig 2020. doi: 10.17235/reed.2020.6833/2019.

REVISTA ESPAÑOLA DE
ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

OR 6833

The rebleeding rate in patients evaluated for obscure gastrointestinal bleeding after negative small bowel findings by device assisted enteroscopy

Catarina Gomes[1], José María Rubio Mateos[2], Rolando Pinho[1], Ana Ponte[1], Adélia Rodrigues[1], Margarita Fosado Gayosso[2], Pilar Esteban Delgado[2], João Carlos Silva[1], Edgar Afecto[1] and João Carvalho[1]

[1]Department of Gastroenterology. Centro Hospitalar Vila Nova de Gaia/Espinho. Gaia, Portugal. [2]Small Bowel Unit. Hospital General Universitario Morales Meseguer. Murcia, Spain

Received: 28/01/2020

Accepted: 01/03/2020

Correspondence: Catarina Gomes. Department of Gastroenterology. Centro Hospitalar Vila Nova de Gaia/Espinho. R. Conceição Fernandes, s/n. 4434-502 Gaia, Portugal
e-mail: catarina.rib.gomes@gmail.com

Abstract

Background: data on the long-term outcome of patients with obscure gastrointestinal bleeding (OGIB) with positive small bowel findings in capsule endoscopy but negative small bowel findings in device-assisted enteroscopy are scarce.

Objective: this study aimed to evaluate the rebleeding rate and time to rebleed in patients with no small bowel findings in enteroscopy, after a positive capsule endoscopy in the setting of OGIB. Baseline predictors for rebleeding were assessed.

Methods: a retrospective double-center study was performed, including patients with OGIB with positive findings by capsule endoscopy and negative small bowel findings by enteroscopy.

Results: thirty-five patients were included. Rebleeding occurred in 40 % of patients during a median follow-up of 27 months. Further evaluation in patients with a rebleed was performed in 85.7 %, leading to a final diagnosis in 78.6 %. The rebleeding rate

increased progressively over time, from 17.2 % at one month to 54.4 % at four years. Overt bleeding at the time of the first episode was a predictor of rebleeding (p = 0.03) according to the multivariate analysis. This was 50 % at one year compared with 21.8 % in patients with occult bleeding on admission.

Conclusions: in obscure gastrointestinal bleeding, long-term follow-up and further evaluation may be considered after a positive capsule endoscopy. Even if there are no small bowel findings by device-assisted enteroscopy. The rebleeding rate in our study was 40 %, mainly in the presence of an overt bleeding on admission.

Key words: Enteroscopy. Small-bowel. Gastrointestinal bleeding. Outcomes.

INTRODUCTION

Small bowel capsule endoscopy (SBCE) is an effective and safe method that enables small bowel visualization. Furthermore, it is an important tool for the management of patients with obscure gastrointestinal bleeding (OGIB) (1). However, SBCE is not able to treat the bleeding site and device-assisted enteroscopy (DAE) was developed in order to address this issue (2). DAE is most often performed following a less invasive and simple small bowel investigation such as SBCE, as it allows the determination of the source of the bleeding and, consequently, a better approach in terms of route and therapeutic planning (3,4). According to the current literature, the diagnostic yield of DAE for OGIB is around 60 %, which is higher after a positive SBCE compared to a DAE performed after a negative SBCE (5). Previous evidence suggested that the rebleeding rate in OGIB was significantly lower in patients with negative SBCE findings (6). No clear recommendations have been proposed for further investigation after a negative SBCE. Even though, repeating SBCE could be useful to detect positive findings, especially in the setting of ongoing bleeding and progressive anemia (7).

DAE enables effective therapeutic interventions such as argon plasma coagulation (APC) and hemostatic clipping and enables the injection of a submucosal tattoo for subsequent surgery or endoscopy (2,8). DAE improves the clinical course of OGIB and there is already a substantial amount of data on the long-term outcomes after a positive DAE in the setting of OGIB. The rebleeding rates are between 10 and 50 % (9-

16).

Data on the long-term outcomes in OGIB after a DAE with negative small bowel findings are scarce (16-20). Thus, the aim of our study was to evaluate the rebleeding rate and time to rebleed in this clinical scenario and to assess baseline predictors of rebleeding.

MATERIAL AND METHODS

Patient selection

A retrospective, double-center analysis was performed between February 2005 and October 2019, at Centro Hospitalar Vila Nova de Gaia/Espinho (CHVNG/E) and Hospital Morales Meseguer (MMH). The patients enrolled in the study presented with OGIB and had positive small bowel findings by SBCE with negative small bowel findings by DAE. Patients under 18 years old and pregnant women were excluded from the analysis. A negative small bowel DAE was considered when there were no lesions or signs of significant bleeding sources in the small bowel, namely angiodysplasia less than 1 mm without oozing, non-bleeding polyp, lipoma, lymphangioma and diverticula without any sign of bleeding. Written informed consent was obtained from all patients for all SBCE and DAE procedures.

Data collection

Patient records were retrieved and reviewed for data extraction. Several variables on patient characteristics, laboratory findings, SBCE and DAE procedures and other diagnostic and therapeutic approaches were collected.

SBCE examination

The SBCE system used in CHVNG/E was the Mirocam® system (Mirocam; IntroMedic, Seoul, Korea), whereas the Pillcam® SB2/SB3 system (Pillcam®; Medtronic, Yokneam, Israel) was used for MMH. Patients underwent the SBCE protocol from each center.

As previously described, all DAE procedures were preceded by a positive SBCE. The authors considered a positive SBCE in the presence of a mucosal break, vascular or tumor lesions or active bleeding. Findings were graded as P0, P1, P2, or P3 according to

their bleeding risk, as previously described (P0: no bleeding potential, including visible submucosal veins; P1: uncertain bleeding potential, such as mucosal red spots; P2: high bleeding potential, such as typical angiodysplasia; and P3: active bleeding on capsule endoscopy) (9,21).

DAE examination

As with SBCE, DAE procedures were performed at both centers. Procedures at CHVNG/E were performed with the single-balloon enteroscope (SIF-Q180; Olympus, Tokyo, Japan) using the usual push and pull technique. The double-balloon enteroscope (EN-450T5, EN-450P5 and EN-580T; Fujinon Inc., Saitama, Japan) was used in procedures performed at MMH using the push and pull technique. The route of DAE insertion was decided on the basis of the location of the bleeding, according to SBCE results.

All DAE reports were reviewed and the data collected included the timing of the procedure in overt-OGIB, type of enteroscope, route of insertion, reach of SBCE findings, endoscopic findings (no lesions or no signs of significant bleeding sources), the presence of other findings outside the small bowel with a high likelihood of bleeding and complications.

Rebleeding

The medical records were assessed to determine rebleeding events. Rebleeding was defined as the need for a blood transfusion, the presence of overt bleeding (melena, hematemesis, or hematochezia) or a reduction in hemoglobin greater than 2 g/dl after exclusion of all other causes of anemia, as previously reported (9).

Further diagnostic evaluation after the rebleeding episode was analyzed, namely the performance of a second DAE. The possibility to achieve a definite diagnosis of OGIB and which treatment strategy was performed was also analyzed. The authors also evaluated if the bleeding lesion was already within the reach of the first DAE.

Outcome

The primary endpoint was the rebleeding rate and time to rebleed after the first DAE with negative small bowel findings. The secondary endpoint included the evaluation of predictive factors for rebleeding after a negative DAE.

Statistical analysis

Continuous variables are expressed as the median (interquartile range [IQR]) and categorical variables are presented as absolute numbers and percentages. Statistically significant differences were evaluated using the Mann-Whitney U test for continuous variables and the Chi-squared test for categorical variables. Univariate and multivariate analyses were performed using logistic regression models to identify risk factors for rebleeding. For the multivariate analysis, only variables with $p < 0.1$ in the univariate analysis were included as covariates. The rebleeding-free time was estimated using Kaplan-Meier survival analysis and defined as the time elapsed from the negative DAE until rebleeding occurred, the patient was censored or the follow-up period ended. Results were considered as significant at $p < 0.05$. The statistical package for social sciences (SPSS), version 20.0 (IBM Corp., Armonk, New York, USA) was used for data entry and data analysis.

RESULTS

Patient and clinical characteristics

Thirty-five patients were included in the analysis. Patient-related characteristics are shown in table 1; 62.9 % were female, with a median age of 62 years (IQR 51-73). More than half of the patients (23/35, 65.7 %) had occult-OGIB. Laboratory findings at admission are shown in table 1.

Procedures

SBCE and first DAE related data are shown in table 2. The timing of DAE in overt bleeding was a median of three days (IQR 1-21). No lesions were identified on DAE in 18 patients (51.4 %). No bleeding from the lesions was detected in the remaining procedures (n = 17, 48.6 %), such as non-bleeding polyps, diverticula without any signs of bleeding, lipoma or lymphangioma, small erosions and non-specific inflammation.

The maximum insertion depth of DAE would theoretically have reached the findings previously identified by SBCE in 21 patients (60 %).

Rebleeding

Rebleeding occurred in 40 % (n = 14) of the 35 patients, during a median follow-up of 27 (IQR 4-51) months. Rebleeding presented as overt bleeding in 71.4 % (n = 10), with a need for blood transfusion in 14.3 % (n = 2) and a decrease in hemoglobin greater than 2 g/dl in 14.3 % (n = 2).

Most patients that rebled (n = 12, 85.7 %) underwent subsequent diagnostic or therapeutic interventions (Fig. 1). It was possible to achieve a conclusive diagnosis to the source of the rebleeding in 78.6 % (11/14) of patients; 63.6 % (7/11) of these lesions were located in the small bowel. All of those patients where a main diagnosis was achieved belonged to CHVNG. From the small bowel diagnoses, three small bowel tumors and ulcerative enteropathy were already identified in the first SBCE. Of note, five of the small bowel lesions detected after rebleeding were not within the reach of the first DAE.

Risk factors for rebleeding

According to the univariate analysis (Table 3), the presence of high risk comorbidities ($p = 0.001$), CVD ($p = 0.02$), a prior history of angiodysplasia ($p = 0.03$), oral iron replacement ($p = 0.02$), overt-OGIB at admission ($p < 0.001$), the need for blood transfusion ($p = 0.002$), higher INR ($p = 0.02$) and lesions with an increased likelihood of bleeding (P2, P3) on SBCE were associated with a higher rebleeding risk. In order to adjust for confounding factors, the presence of high-risk comorbidities, overt-OGIB, blood transfusion requirement on admission and the presence of high potential bleeding lesions on SBCE were included in the multivariate analysis. Only the presence of overt bleeding on admission was associated independently with a higher rebleeding risk ($p = 0.03$), with an odds ratio of 22.9 (1.27-413.1).

Rebleeding free-time analysis

Kaplan-Meier curve analysis (Fig. 2) showed that all rebleeding episodes occurred within the first four years of follow-up and the last rebleeding event occurred after 42 months of follow-up. The rebleeding rate at one month, six months, one, two and four years was 17.2 %, 26.9 %, 31.2 %, 40.1 %, 54.4 %, respectively. After four years of follow-up, only six patients without a rebleed event maintained a follow-up for a maximum period of 14 years.

DISCUSSION

In this study, the rebleeding rate for OGIB after a DAE with negative small bowel findings was 40 % (n = 14), during a median follow-up of 27 (IQR 4-51) months. The rebleeding rate increased progressively over time, reaching 54.4 % of the patients after four years of follow-up.

The majority of patients that rebled underwent further evaluation (85.7 %, 12/14), achieving a conclusive diagnosis in almost all patients (78.6 %, 11/14). Moreover, most of the identified lesions (63.6 %, n = 7) were located in the small bowel, including three vascular and four tumor lesions. Currently, there are limited data to clarify the preferred diagnostic modality after a rebleeding event in a patient with a previous DAE and negative small bowel findings. Apparently, in the presence of a rebleeding episode, the use of alternative non-invasive methods, such as SBCE and CT, may also contribute to lesion detection (18). Although CT usually has a lower diagnostic yield for OGIB compared to SBCE or DAE, it has already been shown that repeat CT at the time of rebleeding may help to identify the source of rebleeding (18). It is important to highlight that five of the small bowel lesions identified with additional diagnostic modalities after rebleeding were not within the reach of the first DAE. This could be associated with an insufficient insertion depth of the first procedure. Nonetheless, 60 % of the findings on the first SBCE were within the reach of the first DAE, which makes this assumption less likely.

The rebleeding rate was identical to previous analyses of negative DAE results in OGIB (37-42.5 %) (16,17,20). Furthermore, the rebleeding rate was similar to the rebleeding rate from studies after a DAE with positive findings (9-12,14,15). Predictive factors for rebleeding after a first negative DAE were identified in this study. According to the

univariate analysis, high-risk comorbidities, CVD, prior angiodysplasia, oral iron replacement, overt-OGIB presentation, the need for a blood transfusion, higher INR and findings with an increased likelihood of bleeding on SBCE were associated with a higher rebleeding risk. However, when adjusting for confounding, only overt-OGIB at the time of the first bleeding episode was considered as a predictive factor for rebleeding. Previous studies have shown that multiple previous bleeding episodes (17) and transfusion requirements (17,18) before DAE could predict long-term rebleeding. These results emphasize the importance of the patient's condition upon admission, since a better initial approach could be performed in order to increase the diagnostic and therapeutic yield of DAE. This could positively impact on the long-term rebleeding rates. The timing of DAE may also contribute to this improvement. An emergent DAE (≤ 24 hours) in overt-OGIB is associated with an increase in the diagnostic yield (22,23) and decreases the rate of rebleeding (24). In our study, the median time of DAE in overt-OGIB was three days, which could influence the high rebleeding rate at one year of 50 % in these patients.

As expected, data on predictive factors for rebleeding after a DAE with positive results are more widely available. Nevertheless, some of these studies in positive DAE reported similar risk factors for rebleeding to those identified for negative DAE (9,13,14). Other series on outcomes after a positive DAE demonstrated an association between rebleeding and cardiac disease (9,10), liver disease (13), Osler-Weber-Rendu disease (11) and a high number of detected lesions on DAE (10,12). One of the major strengths of this study was the long-term follow-up, since the last rebleeding event recorded occurred after 42 months (3.5 years) of follow-up. Thus, indicating the possibility of a new bleeding event after several years.

This study has some limitations. First, this was a retrospective analysis and a small number of patients were enrolled. Second, there might be an inherent selection bias since patients with more rebleeding events may seek more medical care. Third, most of the OGIB literature gathers overt and occult bleeding together, addressing the results of both conditions in a similar way. As suggested by Shinozaki et al. (17), the long-term results after a DAE procedure in OGIB are strongly associated with this type of presentation. The authors found that the rebleeding rate at one year in overt

bleeding patients was 50 %, which is significantly different from the 21.8 % in patients with occult OGIB ($p < 0.01$). Therefore, it could be a great advantage to separate both groups to perform an adequate analysis. Larger and well-designed studies are needed to develop and validate predictive models of rebleeding risk, which could be used in the clinical practice to optimize the long-term outcomes.

In conclusion, long-term follow-up in OGIB and further evaluation may be considered even if the DAE results are negative, as these patients will probably rebleed (40 % in this study), especially if it presents with overt-OGIB. Further diagnostic evaluation after rebleeding, mainly with SBCE, CT and DAE repetition, allowed the identification of the bleeding source in almost 80 % of the patients. More than 50 % of patients rebled after four years of follow-up. Moreover, patients with comorbidities, overt-bleeding and findings with a high likelihood of bleeding on SBCE had a rebleeding more frequently after one year of follow-up than patients without these characteristics did.

REFERENCES

1. Rondonotti E, Spada C, Adler S, et al. Small-bowel capsule endoscopy and device-assisted enteroscopy for diagnosis and treatment of small-bowel disorders: European Society of Gastrointestinal Endoscopy (ESGE) Technical Review. Endoscopy 2018;50(4):423-46. DOI: 10.1055/a-0576-0566

2. Committee ASoP, Fisher L, Lee Krinsky M, et al. The role of endoscopy in the management of obscure GI bleeding. Gastrointest Endosc 2010;72(3):471-9. DOI: 10.1016/j.gie.2010.04.032

3. Pinho R. The vanishing frontiers of therapeutic enteroscopy. GE Port J Gastroenterol 2015;22(4):133-4. DOI: 10.1016/j.jpge.2015.05.003

4. Pinho R, Mascarenhas-Saraiva M, Mao-de-Ferro S, et al. Multicenter survey on the use of device-assisted enteroscopy in Portugal. United European Gastroenterol J 2016;4(2):264-74. DOI: 10.1177/2050640615604775

5. Pennazio M, Spada C, Eliakim R, et al. Small-bowel capsule endoscopy and device-assisted enteroscopy for diagnosis and treatment of small-bowel disorders: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. Endoscopy 2015;47(4):352-76. DOI: 10.1055/s-0034-1391855

6. Teshima CW, Kuipers EJ, van Zanten SV, et al. Double balloon enteroscopy and capsule endoscopy for obscure gastrointestinal bleeding: an updated meta-analysis. J Gastroenterol Hepatol 2011;26(5):796-801. DOI: 10.1111/j.1440-1746.2010.06530.x

7. Lai LH, Wong GL, Chow DK, et al. Long-term follow-up of patients with obscure gastrointestinal bleeding after negative capsule endoscopy. Am J Gastroenterol 2006;101(6):1224-8. DOI: 10.1111/j.1572-0241.2006.00565.x

8. Otani K, Watanabe T, Shimada S, et al. Clinical utility of capsule endoscopy and double-balloon enteroscopy in the management of obscure gastrointestinal bleeding. Digestion 2018;97(1):52-8. DOI: 10.1159/000484218

9. Rahmi G, Samaha E, Vahedi K, et al. Long-term follow-up of patients undergoing capsule and double-balloon enteroscopy for identification and treatment of small-bowel vascular lesions: a prospective, multicenter study. Endoscopy 2014;46(7):591-7. DOI: 10.1055/s-0034-1365514

10. Samaha E, Rahmi G, Landi B, et al. Long-term outcome of patients treated with double balloon enteroscopy for small bowel vascular lesions. Am J Gastroenterol 2012;107(2):240-6. DOI: 10.1038/ajg.2011.325

11. May A, Friesing-Sosnik T, Manner H, et al. Long-term outcome after argon plasma coagulation of small-bowel lesions using double-balloon enteroscopy in patients with mid-gastrointestinal bleeding. Endoscopy 2011;43(9):759-65. DOI: 10.1055/s-0030-1256388

12. Shinozaki S, Yamamoto H, Yano T, et al. Favorable long-term outcomes of repeat endotherapy for small-intestine vascular lesions by double-balloon endoscopy. Gastrointest Endosc 2014;80(1):112-7. DOI: 10.1016/j.gie.2013.11.029

13. Jeon SR, Byeon JS, Jang HJ, et al. Clinical outcome after enteroscopy for small bowel angioectasia bleeding: a Korean Association for the Study of Intestinal Disease (KASID) multiceter study. J Gastroenterol Hepatol 2017;32(2):388-94. DOI: 10.1111/jgh.13479

14. Pinho R, Ponte A, Rodrigues A, et al. Long-term rebleeding risk following endoscopic therapy of small-bowel vascular lesions with device-assisted enteroscopy. Eur J Gastroenterol Hepatol 2016;28(4):479-85. DOI: 10.1097/MEG.0000000000000552

15. Ponte A, Pérez-Cuadrado Robles E, Pinho R, et al. High short-term rebleeding rate in patients undergoing a second endoscopic therapy for small-bowel angioectasias after recurrent bleeding. Rev Esp Enferm Dig 2018;110(2):88-93.

16. Shinozaki S, Yamamoto H, Yano T, et al. Long-term outcome of patients with obscure gastrointestinal bleeding investigated by double-balloon endoscopy. Clin Gastroenterol Hepatol 2010;8(2):151-8. DOI: 10.1016/j.cgh.2009.10.023

17. Shinozaki S, Yano T, Sakamoto H, et al. Long-term outcomes in patients with overt obscure gastrointestinal bleeding after negative double-balloon endoscopy. Dig Dis Sci 2015;60(12):3691-6. DOI: 10.1007/s10620-015-3792-8

18. Hashimoto R, Matsuda T, Nakahori M. False-negative double-balloon enteroscopy in overt small bowel bleeding: long-term follow-up after negative results. Surg Endosc 2019;33(8):2635-41. DOI: 10.1007/s00464-018-6561-x

19. Kushnir VM, Tang M, Goodwin J, et al. Long-term outcomes after single-balloon enteroscopy in patients with obscure gastrointestinal bleeding. Dig Dis Sci 2013;58(9):2572-9. DOI: 10.1007/s10620-013-2588-y

20. Gerson LB, Batenic MA, Newsom SL, et al. Long-term outcomes after double-balloon enteroscopy for obscure gastrointestinal bleeding. Clin Gastroenterol Hepatol 2009;7(6):664-9. DOI: 10.1016/j.cgh.2009.01.021

21. Saurin JC, Delvaux M, Gaudin JL, et al. Diagnostic value of endoscopic capsule in patients with obscure digestive bleeding: blinded comparison with video push-enteroscopy. Endoscopy 2003;35(7):576-84. DOI: 10.1055/s-2003-40244

22. Tu CH, Kao JY, Tseng PH, et al. Early timing of single balloon enteroscopy is associated with increased diagnostic yield in patients with overt small bowel bleeding. J Formos Med Assoc 2019;118(12):1644-51. DOI: 10.1016/j.jfma.2019.01.003

23. Rodrigues JP, Pinho R, Rodrigues A, et al. Diagnostic and therapeutic yields of urgent balloon-assisted enteroscopy in overt obscure gastrointestinal bleeding. Eur J Gastroenterol Hepatol 2018;30(11):1304-8. DOI: 10.1097/MEG.0000000000001244

24. Pinto-Pais T, Pinho R, Rodrigues A, et al. Emergency single-balloon enteroscopy in overt obscure gastrointestinal bleeding: efficacy and safety. United European Gastroenterol J 2014;2(6):490-6. DOI: 10.1177/2050640614554850

REVISTA ESPAÑOLA DE ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

Table 1. Baseline characteristics

	n (%)/median (IQR)
Total of patients	35
Female sex	22 (62.9)
Median age (years old)	62 (51-73)
Comorbidities	21 (60)
CVD	10 (28.6)
Aortic valve stenosis	4 (11.4)
CKD	4 (11.4)
Cirrhosis	4 (11.4)
IBD	4 (11.4)
Prior angiodysplasia	3 (8.6)
Prior abdominal surgery	7 (20)
Hematologic disease	0
Osler-Weber-Rendu disease	0
Medications	23 (65.7)
Antiplatelet drugs	8 (29.2)
AAS	6 (17.1)
Clopidogrel	2 (5.8)
AAS + clopidogrel	1 (2.9)
Ticlopidine	1 (2.9)
Anticoagulant drugs	3 (8.6)
Warfarin	1 (2.9)
Acenocoumarol	1 (2.9)
DOACs	1 (2.9)
NSAIDs	1 (2.9)
PPI	16 (45.7)
Oral iron	13 (37.1)
Characteristics of OGIB before DAE	12 (34.3)
Overt-OGIB	6 (17.1)
Hematochezia	6 (17.1)
Melena	2 (1-4.7)
No. previous episodes	

CVD: cardiovascular disease; CKD: chronic kidney disease; IBD: inflammatory bowel disease; ASA: acetylsalicylic acid; DOACs: direct oral anticoagulants; NSAIDs: non-steroidal anti-inflammatory drugs; PPI: proton pump

inhibitors; DAE: device-assisted enteroscopy; INR: international normalized ratio.

REVISTA ESPAÑOLA DE ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

Table 2. Data from small bowel capsule endoscopy and device-assisted enteroscopy procedures

SBCE	*n (%)*
Complete small bowel examination	33 (94.3)
Appropriate degree of cleanliness	33 (94.3)
Findings	
Type of findings	
Blood	10 (28.6)
Inflammatory lesions	10 (28.6)
Subepithelial lesions	9 (25.7)
Non-ulcerated	6 (17.1)
Ulcerated	3 (8.6)
Angiodysplasia	4 (11.4)
Polyp	2 (5.8)
Non-eroded	1 (2.9)
Eroded	1 (2.9)
Extension of findings	
Single	24 (68.6)
Multiple	11 (31.4)
Likelihood of bleeding	
P0	2 (5.8)
P1	14 (40)
P2	11 (31.4)
P3	8 (22.9)

DAE	*n (%)/median (IQR)*
Timing of DAE in overt-OGIB (d)	3 (1-21)
Type of enteroscope	
Single-balloon	28 (80)
Double-balloon	7 (20)
Route of insertion	
Oral route	23 (65.7)
Anal route	9 (25.7)
Oral + anal route	3 (8.6)
Reach of SBCE findings	
Yes	21 (60)
No	9 (25.7)
Not clear	5 (14.3)
Findings at the negative DAE	
No lesions	18 (51.4)
No significant bleeding sources	17 (48.6)
Findings outside small bowel	2 (5.8)
Colonic angiodysplasia	1 (2.9)
Colonic eroded polyp	1 (2.9)
With simultaneous DAE therapy	2 (5.8)
Argon plasma coagulation	1 (2.9)
Polypectomy	1 (2.9)
Complications	2 (5.7)
Mucosal injury	1 (2.9)
Oozing bleeding	1 (2.9)

REVISTA ESPAÑOLA DE ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

Table 3. Risk factors for rebleeding

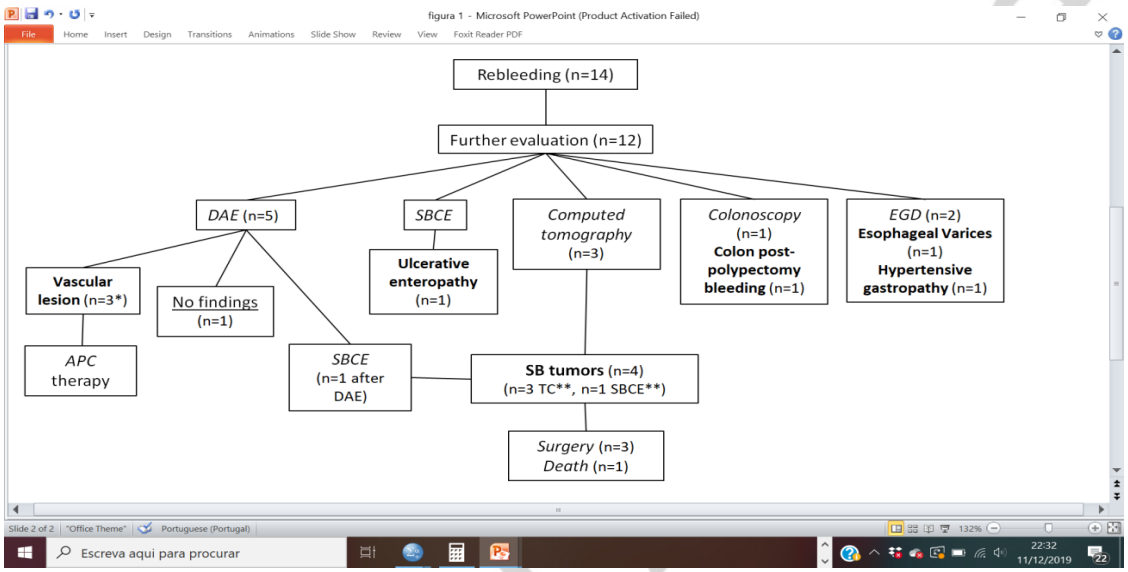
CVD: cardiovascular disease; CKD: chronic kidney disease; IBD: inflammatory bowel

Variables	*Rebleeding (n = 14)*	*Non-rebleeding (n = 21)*	*Univariate analysis p value*	*Multivariate analysis p value*	*Odds ratio (95 % CI)*
Age, years (median, IQR)	68.5 (60.5-76.5)	56 (48.5-70)	0.06		
Female sex (n, %)	8 (57.1)	14 (66.7)	0.57		
Comorbidities (n, %)	13 (92.9)	8 (38.1)	*0.001*	0.06	11.6 (0.9-152)
CVD	7 (50)	3 (14.3)	*0.02*		
Aortic valve stenosis	2 (14.3)	2 (9.5)	0.66		
CKD	2 (14.3)	2 (9.5)	0.66		
Cirrhosis	3 (21.4)	1 (4.8)	0.13		
IBD	2 (14.3)	2 (9.5)	0.45		
Prior angiodysplasia	3 (21.4)	0	*0.03*		
Prior abdominal surgery	4 (28.6)	3 (14.3)	0.30		
Medications (n, %)	10 (71.4)	13 (61.9)	0.56		
Antiplatelet	4 (28.6)	4 (19)	0.51		
Anticoagulant	2 (14.3)	1 (4.8)	0.32		
NSAIDs/AAS	4 (28.6)	3 (14.3)	0.30		
PPI	8 (57.1)	8 (38.1)	0.27		
Oral iron	2 (14.3)	11 (52.4)	*0.02*		
Characteristics of bleeding					
Overt bleeding (n, %)					
Transfusion requirement (n,	10 (71.4)	2 (9.5)	*< 0.001*	0.03	*22.9 (1.3-413)*
%)	12 (85.7)	7 (33.3)	*0.002*	0.97	1.04 (0.08-
Hemoglobin level (median,	8.1 (6.8-9.7)	10.3 (7.6-11.2)	0.07		13.8)
IQR)	172 (129-241)	218 (184-307)	0.06		
Platelet count x10^3	1.1 (1.1-1.3)	1 (1-1.1)	*0.02*		
INR (median, IQR)					
SBCE procedures					

disease; ASA: acetylsalicylic acid; NSAIDs: non-steroidal anti-inflammatory drugs; PPI: proton pump inhibitors; INR: international normalized ratio; SBCE: small bowel capsule endoscopy; CI: confidence interval.

REVISTA ESPAÑOLA DE
ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

Fig. 1. Clinical course after re-bleeding. DAE: device-assisted enteroscopy; SBCE: small bowel capsule endoscopy; EGD: esophagogastroduodenoscopy; SB: small bowel, APC: argon plasma coagulation. *1 of 3 lesions was not within the reach of the first DAE. ** Lesions that were not within the reach of the first DAE.



REVISTA ESPAÑOLA DE
ENFERMEDADES DIGESTIVAS
The Spanish Journal of Gastroenterology

Fig. 2. Kaplan-Meier curves depicting rebleeding during follow-up. A. All rebleeding episodes occurred during the first four years of follow-up. The rebleeding rate at one month, six months, one, two and four years was 17.2 %, 26.9 %, 31.2 %, 40.1 % and 54.4 %, respectively. B. The rebleeding risk in patients with a comorbidity at one year was 43.9 %, compared with 11.1 % in patients without comorbidities ($p = 0.002$). C. The rebleeding rate at one year in patients with overt OGIB on admission was 50 %, which is significantly different from the 21.8 % in patients presenting with occult OGIB ($p < 0.01$). D. The rebleeding rate at one year in patients with findings with a high likelihood of bleeding on SBCE was 38.2 % compared to 23.4 % in patients without these features ($p = 0.02$).