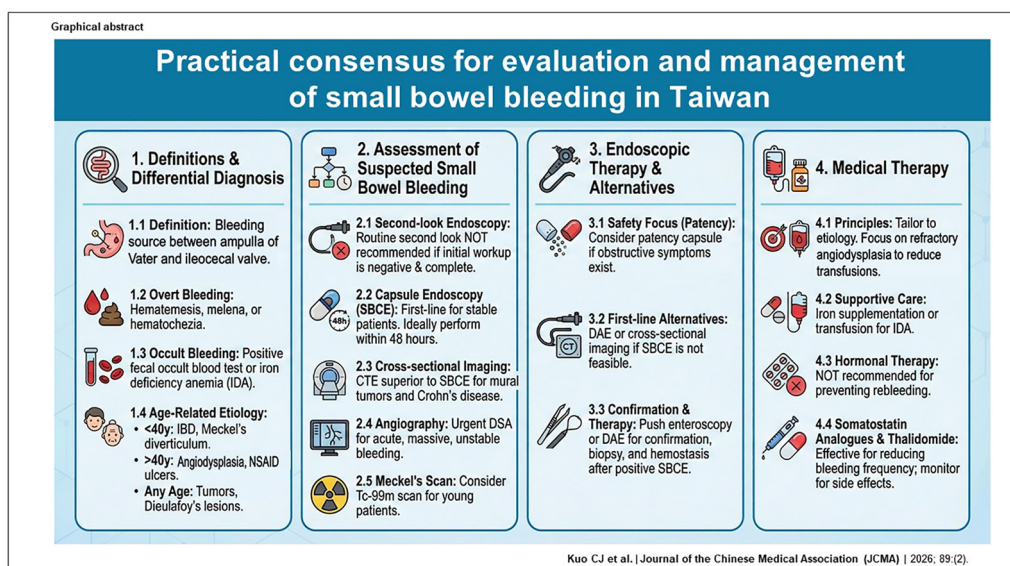


Taiwan practical consensus for evaluation and management of small-bowel bleeding

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Abstract

Small-bowel bleeding, accounting for 5% to 10% of gastrointestinal bleeding episodes, presents a distinct diagnostic challenge due to the organ's length and anatomical complexity. Over recent years, the management of small-bowel bleeding has significantly evolved, driven by advancements in both diagnostic and therapeutic technologies. This Taiwan Association for the Study of Intestinal Diseases (TASID) practical consensus integrates local epidemiology, up-to-date diagnostic advances, including early small-bowel capsule endoscopy, and emerging treatments for vascular lesions such as angiodysplasia. This practical consensus is divided into four major parts, including: (I) terminology regarding small-bowel bleeding and differential diagnosis, (II) evaluation of suspected small-bowel bleeding, (III) endoscopy for small-bowel bleeding, and (IV) medical treatment. Clinicians should be equipped to identify common causes of small-bowel bleeding, understand the advantages and limitations of various evaluation methods, and apply a stepwise, evidence-based approach in managing these patients.

Keywords: Capsule endoscopy; Consensus; Enteroscopy; Small-bowel bleeding

Lay Summary: The small intestine (SB) is a long and tortuous tube in the digestive tract, approximately 6 meters in length. Due to its complex structure, the diagnosis and treatment of SB bleeding have long been clinical challenges. To address this, TASID has developed this practical consensus, incorporating recent advances in diagnostic tools, epidemiology, and treatment methods to supplement and update existing international guidelines, providing practice-oriented diagnostic and therapeutic pathways to assist physicians in clinical decision-making and thereby optimize the quality of care for SB bleeding.

1. INTRODUCTION

Bleeding from the small bowel (SB) remains a relatively uncommon event, accounting for 5% to 10% of all patients presenting with gastrointestinal (GI) bleeding.¹ Although the evaluation of upper and lower GI bleeding is often straightforward, bleeding from the SB remains a clinical challenge.² The SB measures 6 m in length, making up 90% of the surface area of the digestive tract. This anatomical complexity makes it challenging to localize bleeding or other pathology within the SB. Newer endoscopic and imaging techniques have improved assessment but are not always definitive, and optimal diagnostic algorithms are still debated. Diagnostic test accuracy is highly dependent on the timing of the investigation relative to active bleeding. Even after successful identification and treatment, recurrence of SB bleeding is common, with rates as high as 45% reported for angiodysplasias. SB bleeding can result in recurrent hospitalizations, blood transfusions, and serial use of advanced diagnostic tests, increasing both patient morbidity and healthcare costs.

There has been a paucity of data regarding how to manage suspected SB bleeding (SSBB), and a standardized algorithm remains elusive. The availability of major guidelines on SB bleeding—including the ACG guideline (2015) and the ESGE guideline (2022)—was based on the evidence available at that time. Several important advances in diagnostic strategies,

epidemiology, and therapeutic approaches published in recent years were not incorporated into earlier guidelines.

Therefore, TASID has developed this practical consensus aiming to provide a practice-oriented, regionally relevant diagnostic and treatment pathway that complements and updates international recommendations and evidence.

2. METHODS

Twenty-eight experts in gastroenterology and endoscopy, representing 13 medical centers across Taiwan, participated in a consensus conference. Key clinical questions were formulated to guide the process. Targeted literature searches were conducted across major databases, including PubMed, Embase, and the Cochrane Library. Selected articles—such as systematic reviews, meta-analyses, randomized controlled trials, and high-quality observational studies—were circulated to all panel members for thorough review.

Recommendations were further informed by expert experience and adaptations from established international guidelines. Before the conference, relevant thematic areas were identified, and selected papers were disseminated to panel members to facilitate discussion. The existing evidence was critically evaluated and debated in detail. A face-to-face meeting was held in August 2024 to review current evidence and revise preliminary statements. After the meeting, each member independently voted on every statement. For each clinical question, a statement of recommendation was formulated. Consensus was considered achieved when more than 80% of members voted “strongly agree” or “agree” for a statement. The level of evidence and grade of recommendation were rated according to Oxford Centre for Evidence-Based Medicine (OCEBM) 2011 Levels of Evidence, with level 1 and grade A being the highest level of evidence and strongest recommendation, respectively.

All participating experts completed conflict of interest disclosure forms before the consensus conference. No significant conflicts that would bias the guideline recommendations were identified among the panel members.

2.1. Consensus statements

The practical consensus for evaluation and management of SB bleeding was divided into four major parts: (I) terminology regarding SB bleeding and differential diagnosis; (II) evaluation of SSBB; (III) endoscopy for SB bleeding; and (IV) medical treatment. The algorithm for SSBB is shown in Fig. 1.

3. PART I: TERMINOLOGY REGARDING SB BLEEDING AND DIFFERENTIAL DIAGNOSIS**Statement 1.1**

Small bowel bleeding: Patients should be classified as having *small bowel bleeding* if a source of bleeding identified distal to the ampulla of Vater and proximal to the ileocecal valve.

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Conflicts of interest: Dr. Jiing-Chyuan Luo, an editorial board member at Journal of the Chinese Medical Association, had no role in the peer review process of or decision to publish this article. The other authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

Journal of Chinese Medical Association. (2026) 89: 204-211.

Received August 28, 2025; accepted January 5, 2026.

doi: 10.1097/JCMA.0000000000001345

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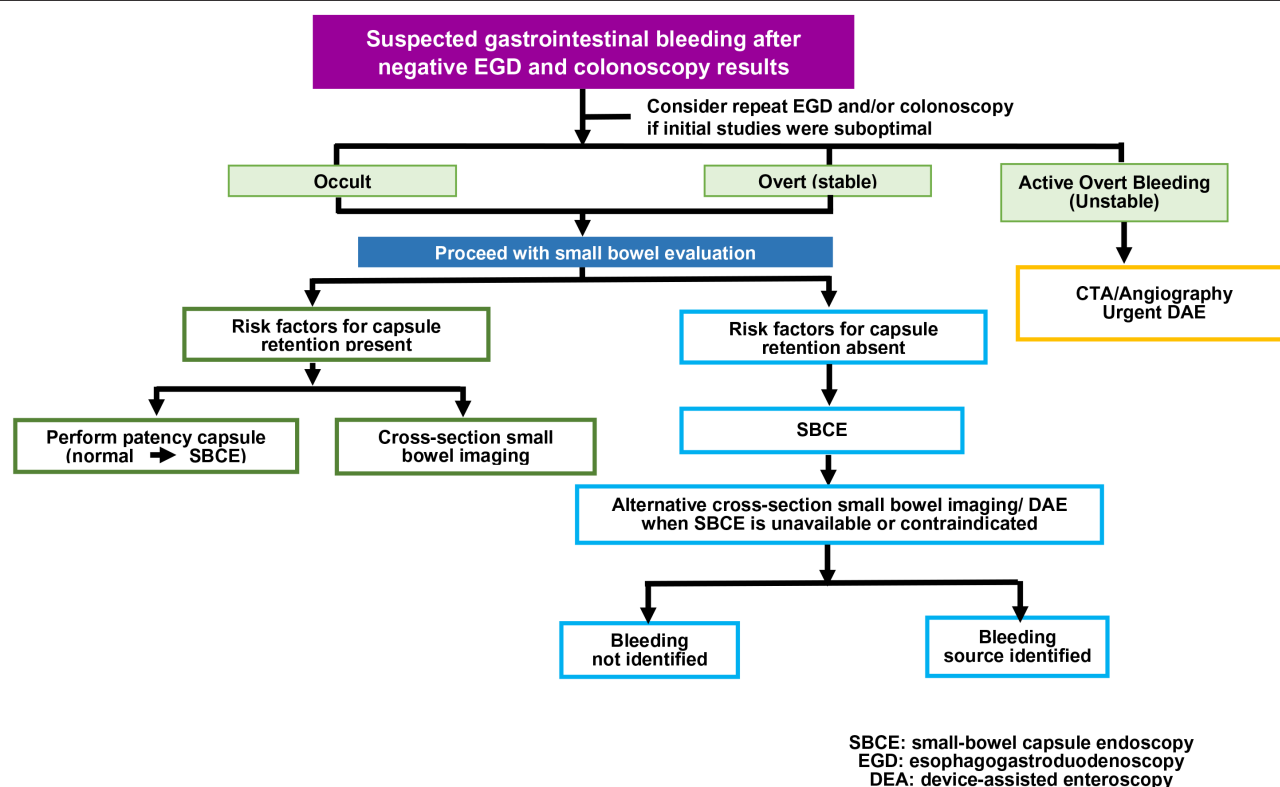


Fig. 1 Practice-oriented diagnostic and therapeutic pathway for suspected small-bowel bleeding.

Agreement: strongly agree 71%, agree: 29%, disagree: 0% (Evidence level: 2b. Recommendation: B)

Patients should be classified as having SB bleeding if a source of bleeding is identified distal to the ampulla of Vater and proximal to the ileocecal valve. After normal upper and lower endoscopic examinations and before the performance of the SB survey, patients should be classified as having suspected SB bleeding (SSBB).

Statement 1.2

Overt small bowel bleeding could be presented as hematemesis, melena, or hematochezia.

Agreement: strongly agree 33%, agree: 67%, disagree: 0% (Evidence level: 2b. Recommendation: B)

Statement 1.3

Occult small bowel bleeding could be presented as positive fecal occult blood testing or unexplained iron-deficiency anemia.

Agreement: strongly agree 33%, agree: 67%, disagree: 0% (Evidence level: 2b. Recommendation: B)

According to the bleeding characteristics, clinical presentations of GI bleeding are also classified as overt or occult. Overt GI bleeding shows visible blood loss with hematemesis, coffee-ground emesis, melena, or hematochezia.

Occult GI bleeding indicates the presence of persistently positive results of fecal occult blood testing, iron deficiency anemia, or both, without evidence of visible GI bleeding.

Statement 1.4

Patients under the age of 40 are more likely to have inflammatory bowel disease or Meckel's diverticulum. In contrast, in patients over 40, vascular lesions such as angiodysplasia and nonsteroidal anti-inflammatory drug induced ulcers are more prevalent. Small bowel neoplasms and Dieulafoy's lesions, however, may occur in both younger and older populations.

Agreement: strongly agree 9.1%, agree: 90.9%, disagree: 0% (Evidence level: 2a. Recommendation: B)

Angiodysplasia manifests endoscopically as erythematous formations, characterized by distinctive arborizing ectatic blood vessels emanating from a central vessel. Multiple lesions frequently occur throughout the GI tract. Angiodysplasia is responsible for about 50% to 60% of GI bleeding diagnosed with SB capsule endoscopy (SBCE).³ The development of angiodysplasia is associated with several risk factors, including advancing age, aortic stenosis, chronic renal failure, cirrhosis, and various hereditary conditions.^{2,4}

Among congenital anomalies of the SB, Meckel's diverticulum holds particular significance. This condition, historically characterized by the "Rule of 2s," affects approximately 2% of the general population. The diverticulum typically resides 2 feet proximal to the ileocecal junction and extends 2 inches in length. It contains two types of ectopic tissue, either gastric or pancreatic, and manifests complications in 2% of cases.⁵ These complications primarily encompass GI bleeding, bowel obstruction, and diverticulitis.⁶ Although Meckel's diverticulum is a rare condition, it should be considered in adult patients presenting with GI symptoms, especially younger patients with overt obscure GI bleeding.⁷ Balloon-assisted enteroscopy (BAE) demonstrates superior diagnostic yields compared to SBCE and conventional imaging modalities.⁷ The diagnostic yield of SBCE has been reported at 45.5%, significantly lower than that of BAE, which not only identifies Meckel's diverticulum but also facilitates tissue sampling and therapeutic interventions, achieving diagnostic yields as high as 84.6%.⁷

Recent epidemiological data from Taiwan demonstrate a notable increase in Inflammatory Bowel Disease (IBD) incidence, rising from 1.81 to 2.34 per 100 000 persons between 2016 and 2020. This trend underscores the growing significance of IBD as a potential source of SB bleeding in clinical practice.⁸⁻¹⁰

SB neoplasms constitute another significant category of bleeding sources. The DEST Multicenter Enteroscopy-Based Epidemiologic

Study has identified distinct patterns in tumor histology. Benign lesions predominantly manifest as hamartomas and adenomas, while malignant neoplasms typically present as lymphomas, GI stromal tumors (GISTs), adenocarcinomas, and metastatic malignancies.¹¹ The median age at diagnosis was notably different between benign and malignant cases, with benign tumors being diagnosed at a median age of 50 years and malignant tumors at 60 years.¹¹ GI bleeding emerged as the most common presenting symptom, followed by abdominal pain and anemia.

4. PART II: EVALUATION OF SUSPECTED SB BLEEDING

Statement 2.1

In patients presenting with occult or overt bleeding with completely negative esophagogastroduodenoscopy (EGD) and colonoscopy results, second look EGD or colonoscopy is not routinely recommended.

Agreement: strongly agree 11%, agree: 81%, disagree: 7%
(Evidence level: 2b. Recommendation: B)

High-quality upper and lower GI endoscopies are essential for the investigation of SSBB. During the colonoscopy, efforts must be made to intubate the terminal ileum to visualize the ileal mucosa and to check for blood originating from a more proximal location in the SB.

A retrospective study in Italy involving 290 patients who underwent SBCE revealed that 30.3% had non-SB bleeding sources that were missed in initial esophagogastroduodenoscopy (EGD) or colonoscopy examinations.¹²

Consideration for a second-look colonoscopy is warranted if the initial colonoscopy was incomplete due to inadequate preparation or if a terminal ileoscopy was not performed. Overall, the existing literature does not support routine repetition of standard endoscopy; such decisions should be made on a case-by-case basis.

Statement 2.2

In cases of suspected small bowel bleeding with hemodynamically stable status, small-bowel capsule endoscopy is recommended.

Agreement: strongly agree 37%, agree: 63%, disagree: 0%
(Evidence level: 2a. Recommendation: B)

The main utility of SBCE is underscored by its high positive (94%-97%) and negative predictive values (83%-100%) in evaluating SSBB, effectively guiding endoscopic or surgical interventions or changes in medical management in 37% to 87% of cases.^{13,14} The diagnostic yield for SSBB varies, with literature reporting a range of 38% to 83% and a systematic review of 227 original articles involving 22 840 procedures indicating a yield of 61%.¹³

Compared with alternative modalities, SBCE has been consistently shown in prospective studies to be significantly superior to push-enteroscopy, computed tomography enterography (CTE), computed tomography (CT) angiography, and standard angiography, and intraoperative enteroscopy, and to be as good as device-assisted enteroscopy (DAE) in evaluating and finding the lesion causing the bleeding in patients with SSBB.¹⁵ A meta-analysis of 14 studies showed that SBCE's diagnostic yields compare favorably at 56% vs 26% for push enteroscopy, and 42% vs 6% for SB series.¹⁶ Additionally, another meta-analysis showed that SBCE has marginally better yields of 62% vs 56% comparing with DBE.¹⁴ SBCE has been reported to be useful as a screening tool before DAE in patients with SSBB. This approach of a "targeted DAE" has been reported to increase both the diagnostic (73%-93%) and therapeutic yield (57%-73%) of the test.¹⁷

Limitations of SBCE included a lack of therapeutic capabilities, difficulty in localizing lesions, rapid transit through the

proximal SB, missing duodenal/proximal jejunal lesions or bleeding, and concern for capsule retention. The diagnostic yields of SBCE may be influenced by multiple factors. It is reported that the timing of SBCE relative to the bleeding episode significantly impacts its diagnostic yield. As demonstrated by Pennazio et al,¹⁸ the yield can be as high as 92.3% for ongoing overt bleeding, but drops to 33% for previous overt bleeding (>14 days prior). A retrospective cohort study suggested that SBCE performed within 3 days of an overt bleeding episode had a significantly higher diagnostic yield (87%) compared to those performed after 3 days (68%).¹⁹ A similar narrow optimal window is also observed in patients who underwent early SBCE (within 48 hours), who were more likely to receive endoscopic treatment and less likely to require blood transfusions compared to those who had SBCE later.²⁰ Recently, a meta-analysis involving 39 studies confirmed higher pooled diagnostic yields for SBCE performed in the first 24, 48, and 72 hours, being 83.4% (95% CI, 76.30%-90.46%), 81.3% (95% CI, 75.20%-87.43%), and 63.6% (95% CI, 45.59%-81.51%), respectively.²¹

ESGE recommends SBCE in patients with overt SSBB as soon as possible after the bleeding episode, ideally within 48 hours, to maximize the diagnostic and subsequent therapeutic yield.¹⁵

Statement 2.3

Cross section imaging study (e.g. CT, CT enterography, MR enterography, CT angiography) could be considered in patients with suspected small bowel bleeding.

Agreement: strongly agree 15%, agree: 85%, disagree: 0%
(Evidence level: 2a. Recommendation: B)

Barium examinations of the SB yield low detection rates (3%-6%) for abnormalities in cases of SSBB and are thus not recommended for these evaluations.^{16,22-25} In contrast, cross-sectional imaging techniques, optimized for the SB, play a significant role and demonstrate superior performance.²⁶

Cross-sectional imaging plays a critical role in evaluating SSBB. A conventional CT is insensitive to subtle findings but may show a tumor or mass, which could be causative in bleeding or acute inflammation.²⁶

CTE utilizes neutral (low-density) oral contrast combined with "enteric phase" CT scanning to optimize contrast resolution between the mucosa and the lumen. It is highly sensitive for detecting mass lesions and mural defects and may even allow visualization of blood within the lumen. A meta-analysis of 18 studies found that CTE had a pooled yield of 40% for detecting SB anomalies, compared to 53% for SBCE.²⁷ Although SBCE yields higher detection rates for vascular and inflammatory lesions, CTE is superior to SBCE for detecting mural-based masses (e.g. tumors, Crohn disease) and extraintestinal pathologies. Therefore, CTE should be performed in patients with SSBB and negative SBCE results due to its higher sensitivity in detecting mural-based SB masses, superior capability to locate these masses, and its ability to guide further deep enteroscopy. MRI enterography (MRE) avoids radiation but is limited by availability and longer acquisition times. CT angiography (CTA) was performed without oral contrast to avoid obscuring active bleeding and detected active bleeding in 30% to 50% of acute lower GI bleeding cases.²⁸ CTA was less effective for intermittent or slow bleeding. Cross-sectional imaging optimizes diagnostic pathways by tailoring modality choice to bleeding severity, patient stability, and suspected etiologies.

Statement 2.4

In acute overt small bowel bleeding, digital subtraction angiography could be performed emergently for patients.

Agreement: strongly agree 30%, agree: 70%, disagree: 0%
(Evidence level: 2b. Recommendation: B)

In cases of acute overt massive GI bleeding, angiography should be performed emergently for hemodynamically unstable patients, leveraging its dual diagnostic and therapeutic

capabilities.^{1,29} For brisk, active, overt bleeding, CTA is preferred over CTE. However, angiography's effectiveness is limited by the need for relatively high bleeding rates (0.5-1.0 mL/min) for detection, and it carries risks such as renal failure, thromboembolic events, and infections or bleeding at the catheter insertion site.¹ Risks include potential complications such as bowel ischemia, which may increase with repeated embolization.²⁹

The diagnostic yield of angiography varies widely (20%-77%) depending on factors such as bleeder characteristics, bleeding rate, and timing relative to the bleeding episode.^{29,30} According to a retrospective study that analyzed patients undergoing CTA followed by enteroscopy for acute overt bleeding, a higher diagnostic yield was noted in patients with bleeding from tumor origin than non-tumor origin.³¹

A retrospective study involving 70 consecutive patients with brisk GI bleeding who underwent angiography and embolization reported a clinical success rate of 71.4%.

However, bowel infarction occurred in 4.3% of cases.³²
Statement 2.5

Technetium-99m pertechnetate Meckel scan could be considered in young patients with suspected small bowel bleeding.

Agreement: strongly agree 19%, agree: 81%, disagree: 0%
(Evidence level: 3b. Recommendation: B)

Based on expert consensus due to limited direct evidence, Technetium-99m pertechnetate Meckel scan could be considered in young patients with suspected SB bleeding. The Technetium-99m pertechnetate Meckel scan is the preferred method for detecting Meckel's diverticulum due to its ability to react with gastric mucosa, which is present in 10% to 60% of these diverticula and may cause bleeding.^{33,34} While the Meckel's scan demonstrates high sensitivity (85%-90%) in pediatric patients, its sensitivity falls below 60% in adults.^{35,36} False positives are possible due to uptake in conditions such as ulcers, inflammatory lesions, arteriovenous malformations, obstructions, intussusceptions, and ectopic gastric mucosa found in duplication cysts.^{33,34} Furthermore, false negatives may result from anatomic or physiological variations, or from inflammation related to ectopic pancreatic mucosa, found in up to 74% of diverticula.³⁷

Clinical manifestations of Meckel's diverticulum vary by age; GI bleeding is more common in children, whereas adults are more likely to experience inflammation and obstructions.

5. PART III: ENDOSCOPY FOR SB BLEEDING

Statement 3.1

In patients with suspected small bowel bleeding, the use of a patency capsule prior to small-bowel capsule endoscopy could be considered when patients with clinical obstructive symptoms. Agreement: strongly agree 8%, agree: 88%, disagree: 4%
(Evidence level: 3b. Recommendation: B)

Based on expert consensus due to limited direct evidence, use of a patency capsule before small-bowel capsule endoscopy could be considered for patients with clinical obstructive symptoms.

Capsule retention is defined by the International Conference on Capsule Endoscopy as the presence of a capsule endoscope in the digestive tract for a minimum of two weeks or the need for directed medical, endoscopic, or surgical intervention to retrieve the capsule.³⁸ A systematic review involving 22 840 SBCE procedures reported an overall capsule retention rate of 1.4% in the general population.¹³ However, in patients with suspected SB disease, another systematic review found a pooled retention rate of 2.1% (95% CI, 1.5%-2.8%).³⁹ The retention rate is higher in patients with SB tumors (9.8%) and even higher in patients with known Crohn's disease (13%).^{40,41}

In addition to Crohn's disease and SB tumors to, previously known as significant risk factors, chronic use of NSAIDs can lead to strictures and increase the risk of retention, with a reported retention rate of 5.8% in patients with a history of NSAID use.³⁹ The same incident rate (5.8%) can also be seen in patients with a history of abdominal radiation therapy due to radiation-induced strictures.³⁹ Other risk factors for capsule retention include a history of SB obstruction, surgical anastomotic strictures, and radiation enteritis.

Screening SB radiographs have not been able to eliminate this problem of capsule retention, as retention is known to occur despite a normal radiography study. In patients with SSBB, the use of a patency capsule before SBCE could be considered when patients have clinical obstructive symptoms. The patency capsule is the same size as the actual capsule endoscope, but it has an outer shell consisting of a parylene coating that dissolves after 30 hours. The use of a patency capsule has been shown to predict the safe passage of a standard capsule endoscope (pooled overall sensitivity, 97%; specificity, 83%).⁴² and to decrease the risk of capsule retention in patients with known Crohn disease.⁴³ If the patency capsule is not excreted up to 30 hours post-ingestion, it is thought that the patency of the GI tract is questionable.¹³

Statement 3.2

When small-bowel capsule endoscopy is unavailable or contraindicated, device-assisted enteroscopy and/or small bowel cross-sectional imaging (e.g. CTE) as the alternative first-line diagnostic tools in patients with suspected small bowel bleeding, depending on availability, expertise, and clinical situations. Agreement: strongly agree 23%, agree: 77%, disagree: 0%
(Evidence level: 2a. Recommendation: B)

According to the meta-analysis comparing SBCE and DBE in 651 patients with SSBB from 10 studies, the pooled diagnostic yield was 62% (95% CI, 47.3-76.1) for SBCE and 56% (95% CI, 48.9-62.1) for DBE, with an odds ratio (OR) for SBCE compared with DBE of 1.39 (95% CI, 0.88-2.20; $p = 0.16$).¹⁷ The other two meta-analyses investigating SB disease also revealed similar diagnostic yields between the two modalities.^{44,45} A retrospective study compared SBCE and DBE in 162 patients with obscure GI bleeding. The overall diagnostic yield was 54.3% for SBCE and 64.1% for DBE, with no statistically significant difference. While DBE showed a slightly higher overall yield, SBCE was more effective in detecting SB lesions in the proximal and middle SB, whereas DBE had a higher yield in the distal SB.⁴⁶

According to a subgroup analysis from a meta-analysis, the diagnostic yield of DBE improved from 56% (95% CI, 48.9%-62.1%) to 75% (95% CI, 60.1%-90.0%) if DBE is preceded by a positive SBCE (OR for positive DBE: 1.79, 95% CI, 1.09%-2.96%; $p = 0.02$).¹⁴ Another meta-analysis reported that SBCE alone had a higher yield compared with DBE in patients with SB bleeding (OR: 1.61, 95% CI, 1.07-2.43), but a significantly lower yield as compared with combining DBE as a combined antegrade and retrograde approach (OR: 0.12, 95% CI, 0.03-0.52).⁴⁴

When DAE is unavailable or unsuitable, cross-sectional imaging techniques, particularly CTE and MRE, offer noninvasive alternatives for SB evaluation. A meta-analysis of a total of 18 studies, involving 660 patients, reported the pooled diagnostic yield of CTE in evaluating SSBB as 40% (95% CI, 33%-49%).⁴⁰ In the subgroup study (7 out of the 18 studies), the yields for CTE and SBCE for all findings were 34% and 53%, respectively (incremental yield: -19%, 95% CI, -34% to -4%).²⁷ Studies have demonstrated CTE's particular strength in detecting SB tumors, with one comparison showing a 94.1% detection rate vs 35.3% for SBCE.⁴⁷ While a meta-analysis revealed that SBCE generally has a higher diagnostic yield (53%) compared to CTE (40%) in SB bleeding cases, evidence suggests these methods play

complementary roles.²⁷ For instance, CTE showed positive findings in 50% of cases with negative SBCE results,⁴⁸ while SBCE identified issues in 57% of cases with negative CTE results.⁴³ Additionally, MRE presents another imaging option, particularly for suspected bowel obstruction; its role in SB bleeding investigation remains limited according to current data.⁴⁷

Statement 3.3

Push enteroscopy or device-assisted enteroscopy is suggested as confirmatory tool after a positive small bowel capsule endoscopy and allows further therapeutical interventions and tissue diagnosis.

Agreement: strongly agree 38%, agree: 62%, disagree: 0%
(Evidence level: 2b. Recommendation: B)

Push enteroscopy and DAE have revolutionized SB examination by enabling direct visualization and therapeutic intervention. These modalities are complementary to SBCE, which offers superior sensitivity in detecting mucosal inflammation, and are typically used after SBCE identifies a concerning lesion.^{15,47}

Three types of DAE are currently available: double-balloon enteroscopy (DBE), single-balloon enteroscopy (SBE), and spiral enteroscopy.

The primary indications for enteroscopy in patients with SSBB include:

1. Positive SBCE findings requiring intervention, such as for biopsy or therapeutic procedures.
2. Contraindications to SBCE. If SBCE is unsafe (e.g. due to strictures, swallowing disorders), enteroscopy could serve as a first-line diagnostic and therapeutic alternative.
3. Negative SBCE with high clinical suspicion. When SBCE is negative but clinical signs (e.g. recurrent anemia, visible bleeding) strongly suggest SB bleeding, DAE provides additional diagnostic yield. Studies report DBE identifying lesions in 27.5% to 39.6% of such cases, including tumors or ulcers missed by SBCE.^{17,49}
4. Active bleeding requiring immediate intervention.
5. Tissue diagnosis and therapeutic management.

A meta-analysis including 12 studies with 756 patients had reported a pooled diagnostic yield of 68.1% for DBE in SSBB.⁵⁰ The diagnostic yield was higher in patients with overt bleeding (87.8%) compared to those with occult bleeding (62.1%).⁵⁰ A similar diagnostic yield is also reported in another meta-analysis, including 66 studies with a total of 12 823 DBE procedures. They found that the diagnostic yield was higher for ongoing overt bleeding (92.7%) compared to previous overt bleeding (70.3%) or occult bleeding (67.8%).¹⁴ Also, some retrospective studies have shown that performing DBE early in the course of bleeding significantly improves the diagnostic yield.^{51,52}

Pancreatitis is a notable complication, especially associated with the antegrade approach of DBE. Clinical pancreatitis occurs in approximately 0.2% to 0.3% of cases, with some studies reporting elevated pancreatic enzymes in up to 50% of patients post-procedure.^{53–56}

Perforation is a serious complication with a reported rate of about 0.1% to 0.3% for diagnostic procedures, increasing up to 4% or higher when a therapeutic method such as dilation or polypectomy is performed. Patients with prior abdominal surgeries or active Crohn disease are at higher risk due to adhesions, altered anatomy, or fixed bowel segments.^{15,57,58}

6. PART IV MEDICAL TREATMENTS

Statement 4.1

Pharmacological therapy should be tailored by the etiologies of small bowel bleeding and it is reserved for patients with refractory bleeding from angiodysplasia after endoscopic or other

alternative interventional managements to reduce need for blood transfusion, hospitalization, and number of endoscopic procedures.

Agreement: strongly agree 4%, agree: 96%, disagree: 0%
(Evidence level: 2a. Recommendation: B)

SB bleeding can be challenging to manage, particularly when endoscopic interventions are insufficient. Pharmacological therapies play a critical role in controlling bleeding. As the most frequently encountered pathology, angiodysplastic lesions are typically treated with Argon Plasma Coagulation to good initial effect, but the rebleeding rate after endoscopic therapy is high.⁵⁹ A meta-analysis of 623 patients with a mean follow-up of 22 ± 13 months demonstrated rebleeding in 45% of treated SB angiodysplasia.⁶⁰

Statement 4.2

Iron supplement and/or blood transfusion should be given to patients with small bowel bleeding concomitant with ongoing iron deficiency anemia.

Agreement: strongly agree 22%, agree: 78%, disagree: 0%
(Evidence level: 2b. Recommendation: B)

Iron deficiency anemia is a common consequence of GI bleeding, including SB bleeding. Management of these patients and treatment decisions should be individualized based on the severity of anemia, rate of bleeding, hemodynamic stability, patient comorbidities, and treatment goals. Regular monitoring and follow-up are essential to evaluate treatment response and adjust therapy as needed.^{61,62}

Statement 4.3

Hormonal therapy is controversial, and continuous estrogen-progestogen treatment is not useful in the prevention of rebleeding from small bowel angiodysplasia.

Agreement: strongly agree 7%, agree: 93%, disagree: 0%
(Evidence level: 1a. Recommendation: A)

Hormonal therapy has been proposed to reduce the angiodysplasia bleeding rate by contributing to hemostasis and decreasing fibrinolysis. However, after some first promising studies, its efficacy in preventing angiodysplasia bleeding was questioned. At present, hormonal therapy is not recommended for patients with SB angiodysplasia. This conclusion is based on an RCT in 2001 involving 72 noncirrhotic patients with confirmed GI angiodysplasia. Patients were randomly assigned to receive either the hormonal treatment or a placebo daily for at least one year. The study observed no significant differences in the number of bleeding episodes or transfusion requirements between the two groups, and the treatment was not an independent predictor for rebleeding prevention.⁶³ Additionally, a review of 14 studies involving patients with gastric, colonic, and SB angiodysplasia indicated that while endoscopic therapy was effective initially, the recurrence of bleeding was 36% over an average of 22 ± 13 months.⁶⁰ The rebleeding rate increased to 45% in studies focused solely on SB angiodysplasia. Hormonal therapy, assessed in two case-control studies, did not demonstrate effectiveness in stopping bleeding, with an OR of 1.0 (95% CI, 0.5–1.96).⁶⁰

Statement 4.4

Somatostatin analogues and thalidomide are effective to reduce bleeding episodes of small bowel angiodysplasia but potential adverse events should be mindful.

Agreement: strongly agree 26%, agree: 74%, disagree: 0%
(Evidence level: 1a. Recommendation: A)

Although many bleeding episodes from SB angiodysplasia were resolved spontaneously, the rebleeding rate was high. According to a meta-analysis, the pooled rebleeding rate was 43% in patients with SB angiodysplasia even after successful endoscopic treatment.⁶⁴ And the incidence of recurrent bleeding was increasing up to 63% at 5 years.⁶⁵ Multiple lesions (≥3), older age, presence of high-risk comorbidities (such as aortic valve stenosis, chronic

renal or liver disease, or Osler-Weber-Rendu syndrome) are associated with a higher rebleeding rate.^{65,66}

Somatostatin analogues, which act as down-regulators of VEGF, have been shown to reduce bleeding episodes and transfusion requirements in patients with SB angiodysplasia. A multicenter RCT demonstrated that Octreotide-LAR (long-acting release) 40 mg administered every 28 days effectively reduces transfusion requirements and healthcare utilization, including endoscopic procedures.⁶⁷ Thalidomide, known for its anti-angiogenic properties via inhibition of VEGF and β -fibroblast growth factor, has shown efficacy in reducing bleeding episodes. A 2023 multicenter double-blind RCT showed 68.6% of patients on 100 mg/day and 51% on 50 mg/day for 120 days achieved $\geq 50\%$ reduction in bleeding events (vs 16% with placebo) during the year after the end of thalidomide treatment. However, 3% of patients discontinued therapy due to adverse effects, which can include neutropenia, sinus bradycardia, deep vein thrombosis, and neurological effects such as neuropathy and tremor.⁶⁸ A meta-analysis involving three RCTs assessing thalidomide's efficacy in improving hemoglobin levels and managing bleeding in patients with SB angiodysplasia indicated a significant mean increase in hemoglobin levels (mean difference of 3.06, 95% CI, 2.66-3.46) and improved secondary outcomes like effective response rate and cessation of bleeding.⁶⁹

Given these findings, while thalidomide and octreotide offer significant benefits in managing SB angiodysplasia, their use requires careful patient selection. Further research is needed to investigate the long-term safety.^{60,70}

7. CONCLUSION

Over recent years, the management of SB bleeding has significantly evolved, driven by advancements in both diagnostic and therapeutic technologies. The TASID consensus integrates local epidemiology, up-to-date diagnostic advances, including early SBCE, and emerging treatments for vascular lesions like angiodysplasia. Clinicians should be equipped to identify common causes of SB bleeding, understand the advantages and limitations of various evaluation methods, and apply a stepwise, evidence-based approach in managing these patients.

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