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LETTER

Small-bowel capsule endoscopy for obscure gastrointestinal bleeding in the ICU

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Dear Editor,

Video capsule endoscopy (VCE) is nowadays considered a common diagnostic procedure for obscure gastrointestinal bleeding, when upper and lower digestive endoscopies fail to provide definite diagnosis [1]. No study has addressed the relevance of VCE to critically ill patients with severe digestive bleeding.

We retrospectively reviewed all VCE (PillCamSB3®) procedures performed in our ICU between 2010 and 2017. We included patients with obscure gastrointestinal bleeding who had required the transfusion of at least two units of packed red blood cells within 1 week prior to the procedure, with capsule deposition and recording carried out in the ICU. We assessed the feasibility and yield of the procedure. Incomplete VCE procedure was defined as failure to reach the cecum prior to termination of battery lifetime. The study was approved by the ethics committee of the French Intensive Care Society.

A VCE procedure was performed in 12 patients (Table 1). Digestive bleeding was the main cause for ICU admission in eight patients (nos. 1–8) whereas it was ICU-acquired in four patients (nos. 9–12). They had been transfused with a mean of 5.4 units of packed red blood cells (range 2–22) within 1 week prior to VCE. All patients had been subjected to both upper and lower digestive endoscopy examinations, without definite diagnosis for bleeding. Contrast-enhanced abdominal CT scan had been performed in five patients prior to VCE, and displayed active jejunal bleeding in one patient (no. 12) who then required urgent arteriography and embolization for uncontrolled massive hemorrhage. The mean time from endoscopy to VCE deposition was 2.5 days. All patients received at least 2 l of polyethylene glycol-based oral solution, resulting in acceptable to good bowel cleansing in seven of them. Capsule deposition was performed under upper digestive endoscopy in anesthetized intubated patients in all cases but one (no. 5). A complete progression of the capsule was achieved in seven patients, with a mean small-bowel transit time of 301 ± 112 min. Potentially incriminated small bowel lesions could be identified in eight patients, related to angiodysplasia ($n=4$) and erosions/ulcerations ($n=4$). However, therapeutic consequences were limited since findings from the VCE procedure led to further specific investigations and treatment in only one patient (no. 3) with cytomegalovirus (CMV) enteritis.

The reported diagnostic yield of the VCE procedure is extremely variable and ranges from 35% to 77% [2] owing to unclear definitions for positive findings in terms of clinical significance or accountability [3]. History of overt bleeding, male sex, and age greater than 60 years have been associated with positive findings of the VCE procedure [4]. The completion of the procedure, depending on the quality of bowel cleansing, may also impact on its diagnostic yield [5]. In critically ill patients, the VCE procedure is subject to technical constraints with respect to bedridden condition, sedation, inability to swallow the capsule, and altered intestinal motility. Post-pyloric endoscopic placement of the capsule could favor a faster progression and should be preferred whenever possible. VCE appears feasible in critically ill patients with obscure gastrointestinal bleeding, with a good diagnostic yield for the type and localization of lesions. However, it does not necessarily support the routine use of VCE in this setting with respect to the technical pitfalls of the procedure and the limited specific therapeutic consequences.

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Table 1 Patients' characteristics and findings

Patient no.	Gender/age (years)	Main cause of ICU admission	Associated conditions	Digestive bleeding	Admission SAPS II score	Time from ICU admission to VCE (days)	Time from endoscopy to VCE (days)	48-h PRBC transfusion	7-day PRBC transfusion	Hb (g/dL)	Bowel preparation	Capsule progression	Findings	Accountability	Final diagnosis of bleeding	Treatment of bleeding	In-ICU outcome
1	W/40	Digestive hemorrhage	Cirrhosis	Hematochezia	33	4	0	8	10	6.9	Good	Incomplete	Duodenal angiodysplasia	High	Portal hypertension	TIPS	Survived
2	W/41	Digestive hemorrhage	HLH/T cell leukemia/DIC/thrombocytopenia	Hematochezia	43	22	4	2	4	8.5	Good	Incomplete	Ileal angiodysplasia	Medium	Neutropenic enterocolitis	PRBC, platelet and plasma transfusions	Died of septic chock
3	W/56	Digestive hemorrhage	Behçet disease	Hematochezia	20	1	5	4	4	7.2	Poor	Complete	Multiple small bowel ulcerations	High	CMV enteritis	Valganciclovir	Survived
4	W/70	Digestive hemorrhage	Cirrhosis	Hematochezia	41	1	2	2	2	8.4	Poor	Complete	None/poor preparation	–	–	Sandostatin	Survived
5	M/72	Digestive hemorrhage	Anticoagulation for atrial fibrillation	Hematochezia	23	3	3	0	2	10.3	Medium	Complete	None	–	–	Transient suspension of antiplatelet agent	Survived
6	M/74	Digestive hemorrhage	Thrombocytopenia (ITP)	Hematochezia	30	2	1	2	2	8.9	Poor	Incomplete	None	–	–	PRBC and platelet transfusion	Survived
7	M/61	Digestive hemorrhage	Anticoagulation for prosthetic valve	Melena	18	2	2	4	4	9.7	Good	Complete	Angiodysplasia	High	Bleeding from angiodysplasia after anticoagulation	Transient suspension of anticoagulation	Survived

Table 1 (continued)

Patient no.	Gender/age (years)	Main cause of ICU admission	Associated conditions	Digestive bleeding	Admission SAPS II score	Time from ICU admission to VCE (days)	Time from endoscopy to VCE (days)	48-h PRBC transfusion	7-day PRBC transfusion	Hb (g/dL)	Bowel preparation	Capsule progression	Findings	Accountability	Final diagnosis of bleeding	Treatment of bleeding	In-ICU outcome
8	M/72	Digestive hemorrhage	NSAIDs	Melena	34	3	3	0	5	9.2	Good	Complete	None	–	–	Spontaneous bleeding cessation	Survived
9	M/39	Bowel obstruction	Chemotherapy for intestinal Burkitt's lymphoma, thrombocytopenia	Melena	34	10	2	2	2	8.1	Poor	Incomplete	Multiple erosions	Medium	Neutropenic enteritis	Spontaneous bleeding cessation	Survived
10	M/47	Encephalitis	Anticoagulation for cerebral venous thrombosis	Melena	62	20	5	3	4	7.5	Good	Complete	Jejunal angiodysplasia	Low	Possible angiodysplasia bleeding	Transient suspension of anticoagulation	Survived
11	M/71	ARDS	CLL/corticosteroid/anticoagulation for atrial flutter	Melena	67	23	3	0	4	8.1	Poor	Complete	Jejunal erosions	Low	Possible bleeding from erosions after anticoagulation	Cessation of anticoagulation	Survived

Table 1 (continued)

Patient no.	Gender/age (years)	Main cause of ICU admission	Associated conditions	Digestive bleeding	Admission SAPS II score	Time from ICU admission to VCE (days)	Time from endoscopy to VCE (days)	48-h PRBC transfusion	7-day PRBC transfusion	Hb (g/dL)	Bowel preparation	Capsule progression	Findings	Accountability	Final diagnosis of bleeding	Treatment of bleeding	In-ICU outcome
12	W/28	Septic shock	Chemotherapy for thymoma	Melena	73	23	1	19	22	6.1	Medium	Incomplete	Jejunal ulcerations	High	Postembolization ischemic jejunitis	Cessation of anticoagulation and vena cava filter placement	Survived

VCE video capsule endoscopy, *SAPS II* Simplified Acute Physiology Score 2, *Hb* hemoglobin on VCE day, *PRBC* packed red blood cells, *ITP* immune thrombocytopenic purpura, *HLH* hemophagocytic lymphohistiocytosis, *DIC* disseminated intravascular coagulation, *G-CSF* granulocyte-colony stimulating factor, *COP* cyclophosphamide, vincristine, prednisone, *CLL* chronic lymphocytic leukemia, *ARDS* acute respiratory distress syndrome, *TIPS* transjugular intrahepatic portosystemic shunt

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Compliance with ethical standards

Conflicts of interest
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