Gastrointest Interv 2014; 3:89–92

Contents lists available at ScienceDirect

Gastrointestinal Intervention

journal homepage: www.gi-intervention.org

Original Article

A re-review of caspule endoscopies of patients referred for deep enteroscopy changes their management

Meagan Gray, J. Matthew Moore, Andrew Brock*

A B S T R A C T

Background: Patients are commonly referred to tertiary centers for deep enteroscopy because of abnormal findings on video capsule endoscopy (VCE). The aim of this study was to determine how often clinical management changes when VCEs are reviewed by an enteroscopist prior to scheduling a procedure.

Methods: A retrospective review was performed of patients referred for deep enteroscopy because of abnormal capsule endoscopy. All VCE images were reviewed prospectively by the tertiary center's enteroscopist. Patients were then scheduled for deep enteroscopy or other management based on the capsule review. The rate of disagreement in the capsule findings, changes in management, and the diagnostic and therapeutic yield of enteroscopy were calculated.

Results: Video capsule endoscopy was available in 45 patients who were referred for deep enteroscopy. The mean age was 61 years (51% were females). Indications included obscure GI bleeding (37 patients), abnormal imaging (3 patients), abdominal pain (2 patients), Peutz-Jegher syndrome (2 patients), and weight loss (1 patient). Referring physician findings included polyps or masses (13 patients), angioectasia (13 patients), ulcers (9 patients), active bleeding (9 patients), nonspecific findings (8 patients), and normal (2 patients). A capsule review led to disagreement of the findings of 13 (29%) patients and led to a change in the management of 9 (20%) patients. The most common reason for a change in management was overcalled lesions. Thirty-seven patients underwent enteroscopy with a diagnostic yield of 48.8% and therapeutic intervention in 24.4%.

Conclusion: A review of referral VCE studies led to a change in management in a large percentage of patients, particularly when the indication was polyp, mass, or ulcer. Patients referred for deep enteroscopy should have their capsule re-read by an enteroscopist prior to scheduling the procedure.

Keywords: deep enteroscopy, review, video capsule endoscopy

Introduction

Video capsule endoscopy (VCE) is widely used in the community for the diagnosis of small bowel disorders. However, deep enteroscopy is generally only performed at tertiary care centers. Thus, when lesions are found that require deep enteroscopy, patients are referred to a tertiary center, often in an open-access manner. Procedures are commonly scheduled, based on the referring physician's interpretation of the capsule findings, but precise anatomic locations of lesions, route of insertion (i.e., antegrade vs. retrograde), and interpretation of capsule findings may be unspecified or incorrect.

At our institution, we reviewed capsule endoscopies prior to scheduling procedures to determine whether deep enteroscopy versus another endoscopic or nonendoscopic test is required, and determine the best route of insertion. Patients are referred in an open-access manner, although only those who will likely benefit from deep enteroscopy (as determined by the enteroscopist) are scheduled for the procedure. Our primary aim was to determine how often changes in clinical management are made for patients who are referred for deep enteroscopy when capsules are reviewed by the enteroscopist prior to scheduling the procedure.

Methods

Patients and variables

We conducted a retrospective analysis of all patients referred to the Medical University of South Carolina (Charleston, SC, USA) between July 2011 and February 2013 for deep enteroscopy in whom the video capsule disc was available for review. Patients were excluded if the VCE had not been reviewed by the enteroscopist before scheduling the procedure. This study was approved by the Institutional Review Board of the Medical University of South Carolina.

Video capsule endoscopy

All capsule endoscopies included in this study used the PillCam SB2 capsule system (Given Imaging, Yoqneam, Israel). No other

Division of Gastroenterology and Hepatology, Medical University of South Carolina, Charleston, SC, USA
Received 18 August 2014; Accepted 10 September 2014
* Corresponding author. Medical University of South Carolina, 25 Courtenay Drive, ART 7100A, Charleston, SC, 29425, USA.
E-mail address: brockas@musc.edu (A. Brock).

2213-1795/$ – see front matter
http://dx.doi.org/10.1016/j.gii.2014.09.002

Table 1 Patient Characteristics and Vce Indications and Findings

Demographics	
Mean age, y (range)	61 (18–79)
Female	23
Male	22
Indications for VCE	
Obscure GI bleeding	37
Abnormal imaging	3
Peutz-Jegher syndrome	2
Abdominal pain	2
Weight loss	1
VCE findings, *n* *	
Polyps/masses	13
Angioectasia	13
Active bleeding	9
Ulcers	9
Nonspecific mucosal abnormality	8
Normal	2

VCE, video capsule endoscopy.
* The VCE findings are by the referring physician.

capsule brands are used by our referral base; therefore, no patients were excluded based on the capsule manufacturer. Capsules were not always made available by the referring physician or, for some patients, were sent on an unreadable disc. In this eventuality, patients were excluded from analysis for this study.

All capsules were first reviewed by the referring physician, and then reviewed prospectively by a single tertiary care physician (A.S.B.), who reads approximately 100 VCEs per year. The capsules were reviewed in their entirety, with a particular focus on abnormal areas thumb-nailed by the referring physician. Interpretation of the capsule findings was prospectively recorded on RAPID for PillCam software (Given Imaging, Yoqneam, Israel).

Enteroscopy

Enteroscopy was performed by a single endoscopist (ASB, who performs over 100 deep enteroscopies annually), by using a single balloon system (SIF-180; Olympus Medical, Center Valley, PA, USA). Antegrade and retrograde approaches were determined at the discretion of the endoscopist. The standard technique was used.[1]

Data analysis

Data were obtained from the RAPID for PillCam database (Given Imaging), endoscopy database, and institutional electronic medical records. The data collected included the indications for capsule endoscopy, VCE interpretation by the referring physician, VCE interpretation by the tertiary care physician, the results of enteroscopy and/or other subsequent tests, and the demographic data. The rate of disagreement in the capsule findings and rate of changes in management, and the diagnostic yield of therapeutic interventions in patients undergoing deep enteroscopy were calculated.

Results

Outside VCE discs were available for 45 patients who were referred for deep enteroscopy. All patients were included in this analysis. The mean age of the patients was 61 years (18–79 years) and 23 (51%) patients were female (Table 1). Indications for VCE included obscure GI bleeding (37 patients), abnormal imaging (3 patients), abdominal pain (2 patients), Peutz-Jegher syndrome (2 patients), and weight loss (1 patient). The referring physician findings included polyps or masses (13 patients), angioectasia (13 patients), ulcers (9 patients), active bleeding (9 patients), nonspecific findings (8 patients), and normal (2 patients). Many patients had more than one finding. Thirty-eight (84.4%) patients were referred for antegrade single balloon enteroscopy (ASBE); 3 (6.7%) patients, for retrograde single balloon enteroscopy (RSBE); 2 (4.4%) patients, for push enteroscopy; and 2 (4.4%) patients, for a second opinion.

Capsule review led to disagreement in the findings of 13 (28.8%) patients (Table 2). Of these 13 patients with discordant findings, there were 11 overcalled lesions, five missed lesions, and three lesions with misidentified locations. Most patients had multiple discordant findings. Overcalled lesions included masses or polyps (5 patients; Figs. 1 and 2); ulcers (4 patients); and angioectasias (2 patients). Missed lesions included angioectasias (2 patients; Fig. 3); gastric antral vascular ectasia (GAVE)/portal hypertensive gastropathy and enteropathy (1 patient); and nonspecific enteropathy (1 patient).

Table 2 Discordant Findings

	Referring physician interpretation	Requested procedure	Capsule review	Procedure	Findings
1	No source of bleeding encountered	ASBE	Angioectasia at 9%, 20%, and 72%	ASBE	Normal
2	Proximal small bowel ulcer	ASBE	Angioectasias in the duodenum, proximal jejunum, proximal ileum and mid-ileum. Bubble artifact rather than ulcer	ASBE	Angioectasias in the duodenum and jejunum treated with APC
3	Multiple submucosal nodules and polyps throughout the small bowel	ASBE	All folds	Observation	N/a
4	Angioectasias and ulcerated lesions in the duodenum	PE	Erythema and focal swelling/mass 8% into the small bowel	ASBE	Normal
5	Submucosalmass in the mid-small bowel	ASBE	Reversed view of the pylorus rather than submucosal lesion. Enteropathy	ASBE	Normal
6	Small bowel polyp	ASBE	Colonic fold	Colonoscopy to exclude polyp	Normal colonoscopy
7	Distal duodenal angioectasias and gastritis	PE	Angioectasias in the mid-jejunum	ASBE	Normal small bowel
8	Multiple small bowel angioectasias; ulcer	ASBE	Multiple small bowel angioectasias; no ulcer	Enteroscopy deferred because of multiple comorbidities and no ulcer present	N/a
9	Mass/lipoma in the mid-small bowel	ASBE	Duodenal angioectasias. The “mass” was light reflex artifact	ASBE	Duodenal and jejunal angioectasias treated with APC
10	Ileal ulcer	ASBE	Food debris; no ulcer present	Enteroscopy deferred	N/a
11	Possible jejunal angioectasia	2nd opinion	Normal	Enteroscopy deferred	N/a
12	Submucosal lesion in the distal ileum	2nd opinion	Fold rather than submucosal lesion	Enteroscopy deferred.	N/a
13	Jejunal ulcer	ASBE	Ulcer in mid-ileum	RSBE	Benign ulcer in the mid-ileum

APC, argon plasma coagulation; ASBE, antegrade single balloon enteroscopy; N/a, not applicable; PE, push enteroscopy; RSBE, retrograde single balloon enteroscopy.