

PillCam® Endoscopy in IBD

Meta-Analysis

Title

Capsule Endoscopy Has a Significantly Higher Diagnostic Yield in Patients with Suspected and Established Small-Bowel Crohn's Disease: A Meta-Analysis

Dionisio PM, Gurudu SR, Leighton JA, Leontiadis GI, Fleischer DE, Hara AK, Heigh RI, Shiff AD, Sharma VK.

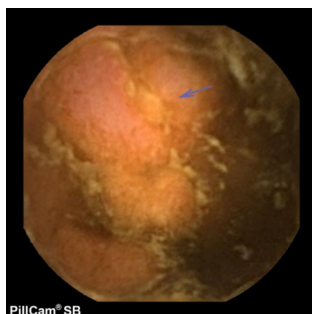
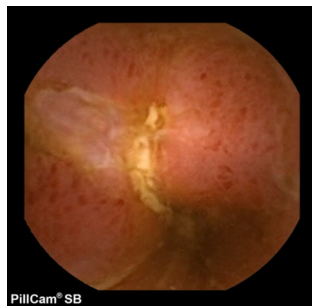
Am J Gastroenterol 2009;In Press.

Key Points

1. A meta-analysis was conducted to prospectively evaluate the yield of capsule endoscopy (CE) with other diagnostic modalities in patients with suspected and known Crohn's disease.
2. Studies showed that CE had a significantly higher diagnostic yield than small bowel radiography (SBR), colonoscopy with ileoscopy (C+IL), and computed tomography enterography (CTE) in patients with *suspected Crohn's disease*. CE also had a significantly higher diagnostic yield than push enteroscopy (PE), SBR, CTE, and C+IL in patients with *known Crohn's disease*.
3. Capsule endoscopy is an important first-line tool for diagnosing suspected and known Crohn's disease, and shows a significantly higher diagnostic yield than that of nearly all other small bowel imaging modalities.

Diagnostic Yield of CE Compared to Other Modalities

	Known Crohn's Disease			Suspected Crohn's Disease		
	Capsule Endoscopy	Other Modality	P- Value	Capsule Endoscopy	Other Modality	P- Value
Push Enteroscopy (PE)	66%	9%	0.00001	33%	9%	0.39
Colonoscopy with Ileoscopy (C+IL)	70%	57%	0.07	47%	25%	0.009
SB Barium Radiography (SBR)	71%	36%	0.00001	52%	16%	0.0001
Computed Tomography Enterography (CTE)	71%	39%	0.0001	68%	21%	0.00001
Magnetic Resonance Enterography (MRE)	70%	79%	0.65	55%	45%	0.43



Abstract:

Objectives: Capsule endoscopy (CE) has demonstrated superior performance compared with other modalities in its ability to detect early small-bowel (SB) Crohn's disease (CD), especially when ileoscopy is negative or unsuccessful. The aim of this study was to evaluate the diagnostic yield of CE compared with other modalities in patients with suspected and established CD using a meta-analysis.

Methods: A thorough literature search for prospective studies comparing the diagnostic yield of CE with other modalities in patients with CD was undertaken. Other modalities included push enteroscopy (PE), colonoscopy with ileoscopy (C+IL), SB radiography (SBR), computed tomography enterography (CTE), and magnetic resonance enterography (MRE). Data on diagnostic yield among various modalities were extracted, pooled, and analyzed. Data on patients with suspected and established CD were analyzed separately. Weighted incremental yield (IY(W)) (diagnostic yield of CE-diagnostic yield of comparative modality) and 95% confidence intervals (CIs) of CE over comparative modalities were calculated.

Results: A total of 12 trials (n=428) compared the yield of CE with SBR in patients with CD. Eight trials (n=236) compared CE with C+IL, four trials (n=119) compared CE with CTE, two trials (n=102) compared CE with PE, and four trials (n=123) compared CE with MRE. For the suspected CD subgroup, several comparisons met statistical significance. Yields in this subgroup were CE vs. SBR: 52 vs. 16% (IY(w)=32%, P<0.0001, 95% CI=16-48%), CE vs. CTE: 68 vs. 21% (IY(w)=47%, P<0.00001, 95% CI=31-63%), and CE vs. C+IL: 47 vs. 25% (IY(w)=22%, P=0.009, 95% CI=5-39%). Statistically significant yields for CE vs. an alternate diagnostic modality in established CD patients were seen in CE vs. PE: 66 vs. 9% (IY(w)=57%, P<0.00001, 95% CI=43-71%), CE vs. SBR: 71 vs. 36% (IY(w)=38%, P<0.00001, 95% CI=22-54%), and in CE vs. CTE: 71 vs. 39% (IY(w)=32%, P<0.0001, 95% CI=16-47%).

Conclusions: Our meta-analysis demonstrates that CE is superior to SBR, CTE, and C+IL in the evaluation of suspected CD patients. CE is also a more effective diagnostic tool in established CD patients compared with SBR, CTE, and PE.

	Group	Studies	Participants	IY (95% CI)
CE vs. PE	A	2	102	0.42 (0.31, 0.53) ^a
	S	2	46	0.18 (-0.23, 0.59) ^b
	E	2	56	0.57 (0.43, 0.71) ^a
CE vs. SBR	A	12	428	0.37 (0.29, 0.45) ^a
	S	8	155	0.32 (0.16, 0.48) ^a
	E	10	224	0.38 (0.22, 0.54) ^a
CE vs. CTE	A	4	119	0.39 (0.27, 0.50) ^a
	S	3	53	0.47 (0.31, 0.63) ^a
	E	3	66	0.32 (0.16, 0.47) ^a
CE vs. C+IL	A	8	236	0.15 (0.07, 0.24) ^a
	S	4	59	0.22 (0.05, 0.39) ^a
	E	7	158	0.13 (-0.01, 0.26) ^b
CE vs. MRE	A	4	123	0.07 (-0.04, 0.17) ^a
	S	3	31	0.10 (-0.14, 0.34) ^a
	E	4	63	-0.06 (-0.30, 0.19) ^a

A, all CD patients; CD, Crohn's disease; CE, capsule endoscopy; CI, confidence interval; C+IL, colonoscopy with ileoscopy; CTE, computed tomography enterography; E, established CD; IY, incremental yield; MRE, magnetic resonance enterography; PE, push enteroscopy; S, suspected CD; SBR, small-bowel radiography.

^aFixed-effect model.

^bRandom-effect model.