

Selected Summaries

WIRELESS CAPSULE ENDOSCOPY IN THE DIAGNOSIS OF SMALL BOWEL CROHN'S DISEASE

Diagnosing small bowel Crohn's disease with wireless capsule endoscopy. Fireman Z, Mahajna E, Briode E, Shapiro M, Fich L, Sternberg A, Kopelman Y, Scapa E. *Gut* 2003;52:390–2.

Wireless capsule endoscopy (WCE) is a novel diagnostic modality that allows noninvasive visualization of the small bowel mucosa and has revolutionized evaluation of obscure gastrointestinal bleeding (*Nature* 2000;405:417–8, *Gastrointest Endosc* 2002;56:349–53). The patient swallows an 11 × 26-mm capsule that transmits 2 video images per second to a receiver worn at the belt. Over the duration of an 8-hour study, more than 50,000 images are captured. Dedicated software allows subsequent evaluation of the images at rates of up to 25 images per second (*Nature* 2000;405:417–8).

Since small bowel mucosa can be visually examined with WCE, diagnosis of small bowel mucosal lesions can be facilitated by this exciting new technique. The article by Fireman et al. evaluates its potential for diagnosing Crohn's disease of the small bowel (*Gut* 2003;52:390–2). A nationwide call for patients in Israel yielded 17 patients with symptoms that could be consistent with small bowel inflammation (abdominal pain, iron deficiency anemia, diarrhea, weight loss, fever, and elevated ESR), with a mean duration of symptoms of 6.3 ± 2.2 years. Small bowel radiography, colonoscopy, and upper endoscopy results were negative within the previous 6 months in all patients; however, only 6 patients had ileoscopy performed during colonoscopy; the results were negative in all instances. WCE demonstrated mucosal erosions, ulcerations, and strictures, predominantly in the distal small bowel in 12 patients, independently confirmed by two examiners. The authors contend that these mucosal lesions were consistent with Crohn's disease, and 10 patients demonstrated good clinical improvement with treatment that included 5-ASA compounds and short-term steroid treatment (*Gut* 2003;52:390–2).

Comments: The main finding of this study is that small bowel mucosal disease can be identified by WCE when the results of other available imaging and endoscopic investigations are negative. There is no question that WCE provides a unique option to visually evaluate small bowel mucosa, which was previously only possible with intraoperative enteroscopy or during laparoscopic or open surgery (*Gastrointest Endosc* 2002;56:349–53, *Am J Gastroenterol* 2002;97:S80, *Gastroenterology* 2002;123:999–1005). Barium small bowel series, the current standard for small bowel involvement in Crohn's disease, may miss mucosal-based disease. In fact, in recent direct comparison, the diagnostic yield of barium small bowel series in suspected Crohn's disease was only 35%, compared with 70% for WCE (*Eur J Gastroenterol Hepatol* 2003;15:363–7).

In addition to identification of mucosal lesions suspicious for Crohn's disease, the procedure can also evaluate for more diffuse small bowel involvement in patients with known colonic or ileocecal Crohn's disease, which may alter the choice of therapeutic agent. Therefore, WCE has potential to replace barium small bowel series in the diagnosis of suspected small bowel Crohn's disease.

The study by Fireman et al. poses questions that expose some of the limitations of WCE. The mere presence of mucosal lesions in the distal small bowel cannot be taken as conclusive evidence of Crohn's disease without biopsy confirmation, despite improvement over the short term with 5-ASA or steroid treatment. One of the main drawbacks of WCE is the fact that mucosal samples cannot be obtained for biopsy. It is unclear whether diagnosis would have been facilitated by intubation and biopsy of the terminal ileum during colonoscopy in all patients, especially since abnormalities were identified in the distal ileum in all but one patient. Ileoscopy is a commonly used and useful adjunct to colonoscopy in suspected Crohn's disease.

Full thickness inflammation of the small bowel wall is a hallmark of Crohn's disease, which may lead to small bowel stricture formation. The size of the capsule endoscope makes impaction leading to retention or even frank small bowel obstruction necessitating surgery a real threat in patients with structuring disease (*Gastrointest Endosc* 2003;57:418–20). When small bowel transit is slow, either from strictures or from extensive inflammatory changes, the 8-hour battery life of WCE may prove limiting. This may be particularly troublesome, as the battery may run out before the capsule reaches the distal ileum, where most of the abnormalities have been identified. Since strictures may not always be identified on imaging studies, it is probably wise to reserve WCE for patients in whom barium small bowel follow-through series fails to provide a definitive diagnosis and excludes strictures (*Gastrointest Endosc* 2003;57:418–20).

Other problems with WCE include lack of precision in localizing abnormalities within the small bowel and the time required to adequately examine the recorded images, which can range from 1 to 2 hours. Despite these limitations, wireless capsule endoscopy is an exciting addition to the armamentarium of tools in evaluating diseases affecting the small bowel, including small bowel Crohn's disease. Further studies and descriptions are needed to better characterize typical appearances of small bowel Crohn's disease and to identify situations in which WCE would offer an advantage over conventional imaging studies in the diagnosis of small bowel Crohn's disease.

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