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• EDITORIAL •

Wireless capsule video endoscopy: Three years of experience

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Abstract

AIM: To review and summerize the current literatue regarding M2A wireless capsule endoscopy.

METHODS: Peer reviewed publications regarding the use of capsule endoscopy as well as our personal experience were reviewed.

RESULTS: Review of the literature clearly showed that capsule endoscopy was superior to enteroscopy, small bowel follow through and computerized tomography in patients with obscure gastrointestinal bleeding, iron deficiency anemia, or suspected Crohn's disease. It was very sensitive for the diagnosis of small bowel tumors and for survailance of small bowel pathology in patients with Gardner syndrome or familial adenomatous polyposis syndrome. Its role in celiac disease and in patients with known Crohn's disease was currently being investigated.

CONCLUSION: Capsule video endoscopy is a superior and more sensitive diagnostic tool than barium follow through, enteroscopy and entero- CT in establishing the diagnosis of many small bowel pathologies.

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INTRODUCTION

The M2A video capsule endoscope (CE) (Given Imaging LTd; Yokneam,Israel) is a wireless capsule (11 mm×27 mm) comprised of a light source, lens, CMOS imager, battery and a wireless transmitter. The slippery out side coating of the capsule allows easy ingestion and prevents adhession of intestinal contents, while the capsule moves via peristalsis from mouth to anus. The battery provides 7-8 h of work in which the capsule photographs 2 images per second (between 50 000-60 000 images all together), which are transmitted to a recorder which is worn on the belt. The recorder is downloaded into a computer and seen as a continous video film. Since its development additional support systems have been added- a localization system, a blood detector and a double picture viewer. All ment to assist the interpretor of the film and to shorten the reviewing period.

INDICATIONS

The full range of indications for CE became apperant with time. The initial device was invented to address a need for a better diagnostic tool for small bowel pathologies.

Obscure gastrointestinal bleeding

The most obvious and the first indication to be tested was obscure gastrointestinal bleeding (OGIB), which occurred in 5-10% of patients with any type of gastrointestinal (GI) bleeding. Several peer reviewed articles and many abstracts have compared the diagnostic yield of CE to push enteroscopy and other modalities in patients with OGIB[1-4]. The added diagnostic yield of enteroscopy was in the range of 25-30%, while that of CE was significantly better (50-67%). This led Cave to propose an algorithm in which the first method to evaluate the small bowel in a patient with gastrointestinal bleeding with negative gastroscopy and colonoscopy would be CE, and then according to its results, the evaluation was continued with either push enteroscopy, angiography or intra-operative enteroscopy[5]. Cave suggested that the closer the study was performed to the time of actual bleeding, the greater the diagnostic yield of CE.

Crohn's disease

The 2nd obvious indication was in patients with suspected Crohn's disease. Three peer reviewed studies published in journal and some more in abstract form demonstrated the superiority of CE compared to small bowel follow through and entero CT in these patients[6-8]. The diagnostic yield of CE in these patients ranged between 43-71%, significantly better than small bowel follow through or entero CT (<30%). Moreover CE diagnosed Crohn's disease in 6-9% of patients that had OGIB[9]. In patients with undetermined colitis the use of CE changed the diagnosis into Crohn's disease in 50% of patients (5/10)[9].

Costamagna *et al*. compared CE and small bowel radiographs in patients with any suspected small bowel disease, another indication for CE[10]. CE was diagnostic in 45% patients, and suspicious in another 40% patients, while X- ray was diagnostic in only 20% patients.

Other indications for CE

Diagnosis of celiac disease, extent of Crohn's disease, GI tumors, NSAID induced small bowel damage and survailance of polyposis syndromes were currently investigated.

We have recently looked at CE in real life. We looked at the charts of the first 160 patients reffered for CE by various doctors to 4 centers in Israel. We found that CE was of value in patients with OGIB (65%), Crohn's disease (55%) and chronic diarrhea (100%), but not in patients with chronic abdominal pain.

Future probable indications

These indications may include monitoring of small bowel damage due to drugs and chemicals (NSAID, *etc.*), monitoring of mucosal healing after various treatments (Crohn's for example), assessing the extent of diseases (Crohn's, celiac) and monitoring/survailance of upper or lower GI damage (esophagitis, Barrett's, polyps).

CONTRAINDICATIONS

The only definite contraindication for CE was a patient with a history of intestinal obstruction or known stricture, or a patient who was a non surgical candidate.

Severe motility problems, or swallowing abnormalities could also preclude the use of CE. Initialy patients with pacemakers were excluded from CE trials, but recent data mostly in abstract form, revealed that CE could be safely performed in patients with pacemakers.

COMPLICATIONS

The major complication with CE was capsule retention or non natural excretion (NNE) which was usually proximal to a stricture. This happened many times despite normal small bowel X-rays. History of NSAID usage, ischemic bowel event or known Crohn's disease, carried higher risk for NNE. NNE that neccesitated surgery occurred in less than 1% of all patients and in 1.25% of patients with Crohn's disease[9]. Usually, there were no clinical signs or symptoms and NNE was found when doing a plain abdominal film. Retrieval of the capsule and ressection of narrowed segment via surgery, usually resolved the medical problem which was detected by the retained capsule.

CONCLUSIONS

M2A CE is a safe, valuable, non-invasive, innovative tool for the diagnosis and management of small bowel lesions like OGIB, Crohn's disease, chronic diarrhea and probably other small bowel diseases.

Newer versions of CE softwear allow us to get better localization and blood detection. Advanced versions will allow us to get therapeutic modalities and a shorter reading time.

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