



Digestive Endoscopy

Correlation between predicted and actual consequences of capsule endoscopy on patient management

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Abstract

Background. Capsule endoscopy (CE) is a relatively new diagnostic modality in the evaluation of patients with suspected small bowel pathology. It is unclear to what extent physicians are able to predict the clinical consequences of CE on patient management.

Methods. In this prospective study, 180 consecutive CE examinations were analysed. Prior to CE, referring physicians were asked to indicate the consequences of CE according to potential different CE outcomes. The influence of CE on patient management was determined with at least 1 year follow-up. Management consequences were defined as *major* (surgical or endoscopic intervention, or medical therapy) or *minor* (nonspecific therapy, including iron supplementation, or no further diagnostic tests).

Results. CE led to major management consequences in 32% of cases. Of patients with obscure gastrointestinal bleeding and normal CE findings, 91% were independent of blood transfusions and experienced no further bleeding episodes during a mean follow-up of 33 months. In 78% of 118 cases that were evaluated, the actual consequences of CE matched the consequences predicted by the referring physicians.

Conclusion. CE had a major impact on patient management in about one third of investigations. In the majority of cases, physicians adequately predicted the clinical consequences of CE.

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1. Introduction

Capsule endoscopy (CE) is a relatively new diagnostic technique to explore the small bowel. Capsule endoscopy has proven to be a valuable tool in the evaluation of obscure gastro-intestinal (GI) bleeding [1,2], suspected Crohn's disease [3–5], celiac disease [6,7] and polyposis syndromes such as Peutz–Jeghers syndrome [8,9]. It has shown to have a higher diagnostic yield for most of these indications compared to conventional diagnostic methods such as push-enteroscopy (PE), enteroclysis, small-bowel-follow-through and CT angiography or conventional angiography [2,4,10–14].

A feature of CE that has been studied less often is the influence of findings of CE on the further management and outcome of patients. In most studies published on this issue, follow-up is usually limited and patient series are relatively small. Another aspect of CE that has not been studied in detail is whether physicians ordering CE procedures are able to predict the clinical consequences of CE for the management of their individual patients. Since CE is usually not available in every hospital, patients are often referred from regional hospitals to a central referral centre. With a relatively new diagnostic modality like CE, one could imagine that it may be difficult for referring physicians, who probably see only a few patients with an indication for CE per year, to predict the clinical consequences of this modality for patient management. It is therefore important to know which possible consequences the referring physician has in mind, when deciding that a CE procedure is indicated. By comparing the actual consequences of CE for patient management

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with the predicted consequences, one could estimate whether the expectations of referring physicians are appropriate. If referring physicians would perform poorly on predicting the consequences of CE on patient management, efforts should be made to better define the indications for CE to avoid unnecessary CE procedures. It must be realised that several factors influence physicians' expectations, including the results and extent of previous clinical investigations, patient characteristics, availability of possible treatment modalities, incidence of expected diseases and the level of experience of the physician with the procedure.

In this study we evaluated the consequences of CE on patient management with a follow-up after the procedure of at least 1 year. In addition, we studied to what extent the consequences of CE on patient management actually matched the referring physicians' predicted consequences of CE.

2. Materials and methods

2.1. Patients and methods

Data from all consecutive CE studies performed in the University Medical Centre Groningen between September 2003 and December 2005 were analysed. Our hospital is a tertiary care centre with a referral base drawing from the northern part of the Netherlands. This is reflected by the fact that 52.2% of patients included in this study were referred from hospitals in the area just for CE.

Prior to each CE, data were collected regarding patient age, gender, medication use, in particular oral anticoagulation and non-steroidal anti-inflammatory drugs (NSAIDs), need for blood transfusions, previously performed diagnostic investigations (gastroduodenoscopy, colonoscopy, push-enteroscopy, SBFT, angiography, computed tomography) and the reason for performing the CE procedure. The reasons for performing a CE procedure were classified in six different categories: (1) obscure-occult GI bleeding; (2) obscure-overt GI bleeding; (3) suspected Crohn's disease; (4) polyposis syndromes; (5) suspected small bowel carcinoma and (6) other indications. Obscure-occult GI bleeding was defined as chronic iron-deficiency anemia without any clinically evident bleeding episode with negative upper and lower endoscopy. Obscure-overt GI bleeding included a history of bleeding episodes marked by melena, hematemesis and/or hematochezia.

Referring physicians were asked in a questionnaire prior to each CE to predict the consequences of CE according to different potential findings. The following potential findings were given: (a) no abnormalities; (b) angiectasias; (c) ulcers/erosions; (d) mass lesion. For each potential finding, physicians were asked to indicate which consequence they would draw from this finding. The following possible consequences were given: (a) conservative therapy (iron supplementation/occasional blood transfusion or wait-and-see/no further investigations); (b) introduction of specific

medical therapy (for example for Crohn's disease); (c) other changes in medical therapy (for example discontinuation of NSAIDs); (d) additional diagnostic procedures (push-enteroscopy, intra-operative enteroscopy or double balloon enteroscopy) and (e) surgery. For example, if a patient was referred for obscure-occult GI bleeding, the referring physician had to indicate prior to CE which consequence the finding of 'no abnormalities' would have on further patient management, which consequence the finding of 'angiectasias' would have on further patient management and so on for every possible finding. For analysis of the correlation between the actual and predicted consequences of CE on patient management, the first step was retrieving the findings of CE for each case. Next, the actual consequence of those findings for patient management, as assessed during the follow-up period, was determined. Finally, the actual consequence on patient management was compared with the consequence predicted by the referring physician.

2.2. Capsule endoscopy procedure

Patients were given standard instructions for the procedure and informed consent was obtained. Patients started fasting from midnight before the procedure. Bowel preparation consisted of 4 l of polyethylene glycol (PEG). The capsule (Given Imaging Ltd., Yoqneam, Israel) was swallowed in the morning and patients were allowed to drink fluids after 3 h and to consume a light meal after 5 h. The CE results were reviewed by at least two of four gastroenterologists (RKW, WJT, AJL or JJK). Any controversial finding was extensively discussed, and findings were classified as relevant or irrelevant. The most relevant findings obtained from CE were documented and categorized as angiectasia(s), ulcer(s)/erosion(s), polyp(s)/tumour(s), or incidental abnormality of esophagus, stomach or colon. CE was considered complete when the cecum was reached.

The clinical outcomes and consequences for patient management of CE were determined at least 12 months after the CE had been performed. Referring physicians were asked to provide patient reports or computerized medical charts. In addition, information was obtained on the occurrence of (re)bleeding episodes and the need for blood transfusions. The consequences of CE on patient management were classified as major or minor in accordance with an earlier publication by Neu et al. [15]. As major consequences were regarded: surgery, endoscopic intervention (e.g. double balloon enteroscopy, push enteroscopy or colonoscopy with argon plasma coagulation-APC), or medical therapy based on positive findings at CE (e.g. introducing Crohn's disease medication, discontinuating NSAIDs). Consequences were considered as minor following CE when no specific therapy was started (e.g. iron supplementation therapy) or when no further diagnostic tests had been performed due to either negative findings of CE or positive findings of CE considered to be irrelevant.

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