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Tailoring Crohn's disease treatment: The impact of small bowel capsule endoscopy

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Abstract

Background and aims: Small bowel capsule endoscopy (SBCE) may detect proximal small bowel lesions that have been previously missed by ileocolonoscopy and small bowel imaging in patients with known ileal and/or colonic Crohn's disease (CD). We aimed to evaluate whether the therapeutic management is influenced by SBCE findings.
Methods: Retrospective single center study. Inclusion of consecutive patients with known non-stricturing and non-penetrating ileal and/or colonic CD, submitted to SBCE to evaluate disease extension and activity, with ≥ 1 year follow-up. Lesions were classified with the Lewis score (LS) as non-significant (LS < 135), mild (135 ≤ LS ≤ 790), or moderate-to-severe (LS > 790). Therapeutic changes were assessed three months after SBCE.
Results: Fifty consecutive patients (35 ± 13 years, 52% females) were included. At ileocolonoscopy, disease location was ileal (L1) in 60%, colonic (L2) in 10% and ileocolonic (L3) in 30% of the patients. In 33 patients (66%) SBCE detected significant proximal lesions previously missed by other modalities. The proportion of patients on thiopurines and/or biologics before SBCE was 2/50 (4%); this was significantly higher three months after SBCE, 15/50 (30%), p = 0.023. Treatment with thiopurines and/or biologics was started more often in patients with proximal small bowel lesions [13/33 (39%) vs. 1/17 (6%), p = 0.011, relative risk (RR) 6.5], particularly when severe (6%, 36% and 45% of patients with non-significant, mild and moderate-to-severe inflammation, respectively).
Conclusions: SBCE diagnoses previously undetected lesions and it influences therapeutic management of CD, triggering an earlier introduction of immunomodulators and/or biological therapy.

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1. Introduction

Crohn's disease (CD) is a chronic idiopathic inflammatory bowel disease that may affect any segment of the digestive tract and often involves the small bowel.[1] Ileocolonoscopy remains the first endoscopic procedure to establish the diagnosis in patients with suspected CD. Irrespective of the findings at ileocolonoscopy, further investigation is advisable to determine the location and extent of CD in the upper gastrointestinal tract and the small bowel.[1] The evaluation of the small bowel often relies on cross-sectional imaging with magnetic resonance enterography (MRE) or computed tomography enterography (CTE), for the assessment of the transmural nature of the disease and its anatomical distribution, characterization of strictures and detection of extraluminal disease. In this setting, the role of small bowel capsule endoscopy (SBCE) is still evolving.[2] SBCE has been shown to improve the detection of proximal small bowel lesions when compared to both CTE and MRE, while the diagnostic yield seems to be equivalent when lesions are limited to the terminal ileum.[3,4] The clinical implications of this incremental yield, mainly for mild proximal lesions, in patients with known CD remain to be clarified, although it is currently recognized that the finding of extensive and/or proximal lesions may influence therapeutic decisions towards an earlier introduction of immunomodulators and/or biological therapy, with the aim of reducing long term complications and disabling disease.[5–7] Nonetheless, data regarding the impact of SBCE findings on therapeutic decisions are scarce,[8,9] and the burden of proximal lesions in patients with known CD has not been extensively investigated.

The aim of this study was to determine whether new lesions detected by SBCE in the proximal small bowel and/or not previously recognized at the index ileocolonoscopy influenced the therapeutic management of patients with known ileal and/or colonic CD.

2. Methods

We conducted a single center retrospective study, from January 2008 to December 2012, with an inclusion of consecutive patients with established non-stricturing and non-penetrating ileal and/or colonic CD, submitted to SBCE to assess disease extent and activity. All patients had an ileocolonoscopy as the first endoscopic diagnostic procedure. Patients with unsuccessful ileoscopy at colonoscopy were not included in this study. Patients with obstructive symptoms and/or those with evidence of ileal stenosis at ileocolonoscopy and/or radiological features of stricturing or penetrating disease did not undergo subsequent SBCE. Small bowel radiological imaging was not mandatory prior to SBCE. Thus, patients with no clinical features of stricturing or penetrating disease and no stricture at the index ileocolonoscopy were allowed to undergo SBCE without previous small bowel imaging. Patients taking aspirin or nonsteroidal anti-inflammatory drugs discontinued the medication at least four weeks before the SBCE. Baseline variables assessed at the time of SBCE included age, Montreal classification, serum inflammatory biomarkers, history of abdominal surgery related to Crohn's disease and current medication. All patients followed a clear liquid diet for 24 h and 12 h fasting prior to SBCE (PillCam® SB2, Given® Imaging Ltd Yoqneam, Israel). All SBCE were reviewed by two experienced physicians (>200 SBCE examinations) using RAPID Reader®, and in case of no interobserver agreement the findings were reviewed until a consensus report was achieved. Small bowel inflammatory activity was systematically assessed with the Lewis score[10] (LS) for each tertile of the small bowel, using the calculator included in the RAPID® software. The length of each tertile was determined by equally dividing the small bowel transit time of the capsule in three parts. Following a widely accepted methodology,[10] a LS <135 was assumed to correspond to normal examination or clinical insignificant lesions, a LS of 135 to 790 corresponded to mild inflammatory activity, and a LS >790 corresponded to moderate or severe inflammatory activity. Small bowel lesions were considered to have proximal location if they were located in the upper two thirds of the small bowel (first two tertiles of the SBCE) and/or located in the third tertile proximal to the terminal ileum, out of the reach of the colonoscope. For the purpose of the study, the terminal ileum was considered to correspond to the last 10 min of the passage of the capsule in the small bowel before entering the cecum, which translates to a length of approximately 15 cm, assuming an average velocity of 1.5 cm/min for the passage of the capsule, as described elsewhere.[11] In those cases where the capsule did not reach the cecum, small bowel tertiles were determined based on the last small bowel image available; in those cases, the relative position of the capsule to the ileocecal valve was estimated using topographic landmarks with the localization track of RAPID® software, as well as the estimated distance from the duodenum at the time of battery exhaustion. Any changes in CD medication within three months after the SBCE were assessed.

Statistical analysis was performed using SPSS version 16.0 (SPSS Inc., Chicago, Illinois). Baseline and SBCE data were summarized using descriptive statistics. Categorical data were analyzed with Pearson's chi-squared or Fisher's exact test. Univariate and multivariate logistic regression analyses were performed considering the start of thiopurines and/or biologics within three months of the SBCE as the dependent variable. A p-value <0.05 was considered statistically significant.

3. Results

Fifty consecutive patients (mean age 35 ± 13 years, 52% females) with known non-stricturing and non-penetrating ileal and/or colonic CD, submitted to SBCE to assess disease extent and activity, were included in the study. Baseline characteristics, interventions and outcomes of the population are summarized in Table 1. SBCE was performed shortly after (less than 3 months) the diagnosis of CD in 70% of patients (n = 35) and within the first year after the initial diagnosis in 84% (n = 42). The location of the disease at the index ileocolonoscopy was ileal (L1) in 60% (n = 30), colonic (L2) in 10% (n = 5) and ileocolonic in 30% (n = 15) of patients. Seven patients (14%) had perianal fistulae and/or abscesses. Seven patients (14%) had previous history of abdominal surgery related to CD. Small bowel imaging was performed in 32 patients (64%), either with CT enterography/enteroclysis (n = 13), CT with no oral contrast intake (n = 10), MR enterography (n = 4) or small bowel follow through (n = 5). Small bowel imaging was unremarkable in 56% (n = 18) and

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