

## Video Capsule Endoscopy in Egyptian Patients with Chronic Diarrhea

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**Abstract:** The small bowel is an organ very difficult to explore with the available endoscopic, radiological and nuclear medicine techniques. This study aimed at evaluating the role of video capsule endoscopy (VCE) in the diagnosis of chronic diarrhea in patients whom other investigations failed to diagnose. Retrospective study conducted on 40 patients indicated for VCE examination after failure of all other investigational modalities to diagnose the cause of chronic diarrhea. Results revealed that celiac disease (n=9) and Crohn's disease (n=9) were diagnosed as a cause of chronic diarrhea using VCE with a diagnostic yield of 45% and the diagnosis was confirmed later on by histological examination of biopsies. A significant association was detected between patients with no VCE retention during examination and the relevance of the findings detected during VCE examination in explaining the cause of chronic diarrhea p-value=0.001. In conclusion, the VCE is of value in the evaluation of chronic diarrhea in patients with previous negative investigational workup.

**Key words:** VCE • Chronic diarrhea • Capsule retention • Celiac disease • Crohn's disease

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### INTRODUCTION

Till few years ago, the small bowel was an organ very difficult to be explored with the available endoscopic, radiological and nuclear medicine techniques [1]. Nowadays Video Capsule Endoscopy (VCE) evaluates, with high resolution images, the whole small bowel, avoiding any sedation, surgery or radiation exposure [2]. Widely accepted indications of VCE are obscure bleeding; iron deficiency anemia; Crohn's disease; abdominal pain; polyposis coli; celiac disease; and small bowel tumors [3].

There is a paucity of data about the yield of capsule endoscopy in patients with chronic abdominal pain or diarrhea alone [4]. This retrospective study aimed at evaluating the role of VCE in the diagnosis of chronic diarrhea whom other investigations failed to diagnose.

### MATERIAL AND METHODS

A retrospective study was conducted on patients complaining of chronic diarrhea (n=40) attending to El Safwa hospital endoscopy unit in the period from September 2007 to September 2010 after approval of the

local scientific ethical committee. Data of the patients were extracted from the medical database of the hospital. All patients with no specific clinical and laboratory diagnostic findings to chronic diarrhea were indicated for upper GI endoscopy, enteroscopy and colonoscopy. Those who remained undiagnosed for the cause of chronic diarrhea were indicated for capsule endoscopic examination after either BMFT (barium meal follow through) or CT enteroclysis to assess the patency of the GIT of the patients. Olympus Capsule Endoscope System "Endo Capsule" was used. Gastric transit time (GTT) was calculated as the time between the first captured gastric image and the first duodenal image. Small bowel transit time (SBTT) represents the time between the first duodenal image and the first cecal image.

**Statistical Analysis:** Patients' data were analyzed using SPSS 17.0 for windows 7. Quantitative variables were expressed by mean and SD (Standard deviation). Qualitative variables were expressed by numbers (Frequency) and percent compared between groups using Chi-square test and Fisher exact test. P value was considered to be significant if less than 0.05.

**RESULTS**

The mean age of the studied group was 39.68±14.83 years with ages ranging between 20 and 71 years, data of the studied group were represented in Table (1). Only 42.5% of our studied group experienced attacks of abdominal colics with diarrheal bouts and 52.5% were associated with dyspepsia. Fasting did not lead to any improvement in the condition of chronic diarrhea except in two patients only. Upper gastrointestinal endoscopic examination showed signs of inflammation in 14 patients, colonoscopic examination showed signs of inflammation in 7 patients, enteroscopy showed signs of inflammation in only 2 patients but this didn't yield any relevant diagnosis for the cause of chronic diarrhea. None of the studied cases showed any gastrointestinal obstruction signs during BMFT or CT entrocylsis. Retention of the VCE in the ileum was reported in 10 patients as well as being retained in the stomach in only 3 patients where all the capsules were retrieved in stool after 12 hours to five days, while the rest of the studied group, 27 patients, showed no VCE retention. If the capsule didn't pass the pylorus in time, the patient would undergo endoscopic placement, which was likely to avoid potential capsule delay and allow a successful VCE study. The videos of capsule endoscopic examination were observed with a mean observation time of 42.53±12.146 minutes by expert endoscopists of our center. The VCE examination showed signs relevant to the cause of chronic diarrhea in 18 patients with a diagnostic yield of 45%, where 9 cases showed signs suggestive of celiac disease with one of them showing a mass in the ileum.

Table 1: Studied parameters of patients:

Parameter	Mean	SD
Duration of chronic diarrhea (years)	4.91	6.76
Duration of VCE examination (hours)	7.4	1.169
Gastric transit time (min)	25.2	25.4
SBTT (hours)	4.5	1.6
Parameter:	Num.	%
Character of the stool:		
Well formed stool	13	32.5
No blood or mucus in stool	10	25
Mucus in stool	9	22.5
Watery stool	5	12.5
Mucus and blood in stool	2	5
Blood in stool	1	2.5
Symptoms		
Weight loss	13	32.5
Fever	9	22.5
Nausea	11	27.5
Dyspepsia	21	52.5
Vomiting	9	22.5
Abdominal distension	22	55.0
Colic	17	42.5
Bleeding per rectum	3	7.5
Tenesmus	1	2.5
Bouts following meal	2	5
Constipation alternating with diarrhea bouts	2	5
VCE retention No.	27	67.5
Yes : in ileum	10	
In stomach	3	

Nine cases showed signs suggestive of crohn's disease with one of them showing a mass in the ileum as well (Figure 1). There was a statistically significant association between patients with no VCE retention

Table 2: Comparison between patients with relevant findings to the cause of chronic diarrhea and those with non relevant findings during VCE.

	Capsule endoscopic examination		p-value
	Signs non relevant to chronic diarrhea (n=22)	Signs relevant to chronic diarrhea (n=18)	
Sex F/M	8 (36.4%)/14 (63.6%)	11 (61.1%)/7 (38.9%)	0.1
Fasting:			
Improved/Not improved	2 (9.1%)/20 (90.9%)	0%/18 (100%)	0.2
Bleeding per rectum No/Yes	3 (13.6%)/19 (86.4%)	18 (100%)/0%	0.1
Nausea no/Yes	18 (81.8%)/4 (18.2%)	11 (61.1%)/7 (38.9%)	0.1
Vomiting no/Yes	19 (86.4%)/3 (13.6%)	12 (66.7%)/6 (33.3%)	0.1
Dyspepsia no/Yes	8 (36.4%)/14 (63.6%)	11 (61.1%)/7 (38.9%)	0.1
Abdominal distension No/Yes	8 (36.4%)/14 (63.6%)	10 (55.6%)/8 (44.4%)	0.1
Constipation alternating with diarrhea bouts No/Yes	18 (81.81%)/4 (18.8%)	18 (100%)/0	0.57
With colics no/Yes	11 (50%)/11 (50%)	12 (66.7%)/6 (33.3%)	0.2
Weight loss no/Yes	15 (68.2%)/7 (31.8%)	12 (66.7%)/6 (33.3%)	0.59
Cecal entry at expected time no/Yes	9 (40.9%)/13 (59.1%)	4 (22.2%)/14 (77.8%)	0.001

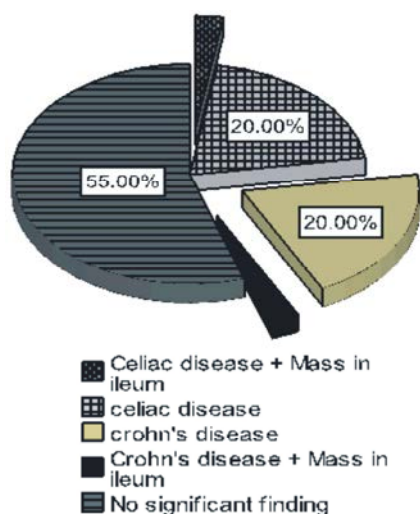


Fig. 1: Diagnosis made on VCE examination:

during examination and the relevance of the findings detected during VCE examination in explaining the cause of chronic diarrhea p-value=0.001 (Table 2). No statistically significant difference was detected on comparing other studied parameters among those with signs relevant to the cause of chronic diarrhea (n=18) with those with non relevant signs (n=22).

After VCE examination, biopsies were obtained endoscopically from the 18 cases to confirm the diagnosis suggested by VCE examination. Histological examination of the biopsies obtained confirmed a diagnosis of celiac disease in 2 males and 7 females and Crohn's disease in 4 females and 5 males.

## DISCUSSION

This retrospective study reported that 95% of the studied group of patients had not improved on fasting indicating that the diarrhea is of the secretory type [5], While 5% had improved on fasting indicating that the diarrhea is of the osmotic type [5]. In this study the cause of chronic diarrhea was diagnosed in 18 patients with a VCE diagnostic yield of 45% going with what was reported in other study [6] and higher than what was reported in other studies with a diagnostic yield of 31% [7] and 13 to 24% in others [8,9].

Although VCE is not as accurate as histopathological examination, it could be a reasonable alternative method of diagnosing Celiac disease [10]. Video capsule endoscopy is an attractive technique for assessing celiac disease because it is noninvasive and

provides a close and magnified view of the mucosa of the entire small bowel [11]. In our study nine cases were diagnosed as celiac disease and this diagnosis was confirmed later on by biopsy (extensive duodenal biopsy). This is in agreement with de Franchis [12] who concluded that CE appears to be equivalent to histology for detecting severe pathological findings in patients with suspected celiac diseases. Also it was stated that celiac disease indications for CE is positive serology in patients with negative biopsy to visualize patchy, difficult-to-diagnose disease [13].

Capsule endoscopy has also demonstrated similar or superior diagnostic efficacy to other endoscopic or radiologic diagnostic procedures in patients with suspected Crohn's disease [14,15]. In our study nine patients showed a picture suggestive of Crohn's disease and also this diagnosis was confirmed later on by biopsy results (colonoscopy with deep ileum intubation and ileal biopsies) confirming the outcomes classifications previously reported: Diagnostic of Crohn's disease for multiple ulcerations; Suspected Crohn's disease for  $\leq 3$  ulcerations; and non-specific or normal for normal CE or non-specific findings [16].

The incidence of incomplete examination was related to delayed passage of the capsules past the pylorus [17]. The significant association detected in our study between the successful VCE examination with no retention and the diagnosis of the cause of chronic diarrhea. This is in agreement with what was reported in other studies [18]. The small bowel transit time in our study was very close to that which was found by previous studies where the mean small bowel transit time measured in a group of volunteer patients was 194 minutes but differed from the mean gastric transit time which was 63 minutes [19], the presence of pathological lesions may be a factor behind this difference. Our results showed that 67.5% of our studied group of patients had successful VCE examination with the capsule reaching the cecum at the expected time, which is very close to what was reported in other studies [20,21].

Capsule endoscopy is of value in the evaluation of chronic diarrhea in patients with previous negative endoscopic or radiologic workup with an overall diagnostic yield of 45%. The complete VCE examination without capsule retention enhances the diagnostic ability of the capsule. Further studies with larger sample size are recommended to confirm the role of VCE in chronic diarrhea patients.

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