

Full spectrum endoscopy for an easy and adequate visualization of Vater's papilla

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Abstract: Patients with classical familial adenomatous polyposis (FAP) are at high risk for developing colorectal cancer (CRC) and duodenal adenomas. Current guidelines recommend to start duodenal screening at the age of 25–30 years and standard upper gastrointestinal (GI) endoscopy is considered inadequate for an optimal visualization of the duodenum. We used the Full-Spectrum Endoscopy® (FUSE®; EndoChoice Inc., Atlanta, GA, USA) esophagogastroduodenoscope (FUSE-EGD) for an upper GI screening procedure of a 20-year-old Caucasian male with classical FAP. The pioneer design of the FUSE-EGD allowed an easy and accurate examination of the ampulla with standard scope manipulation maneuvers.

Keywords: Full-spectrum endoscopy (FUSE); gastroscope; familial adenomatous polyposis (FAP); surveillance

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Introduction

Patients with classical familial adenomatous polyposis (FAP) should undergo screening for proximal small bowel tumors. Standard (i.e., forward-viewing) upper gastrointestinal (GI)-endoscopy does not allow an adequate examination of the duodenum, especially of the peri-ampullary region; therefore, complementary use of side-viewing endoscopes is mandatory, as visible ampullary lesions require histological assessment (1). A novel Full-Spectrum Endoscopy® (FUSE®) (EndoChoice Inc., Atlanta, GA, USA) esophagogastroduodenoscope (EGD), that provides a high-definition 245° field of view with two imagers on the front and left side of the endoscope, has been recently introduced. This endoscope allows the endoscopist to perform a forward-viewing examination with an adequate visualization of the ampullary region. Here we report the case of a male patient with FAP, who underwent upper GI endoscopy with the FUSE-EGD system.

Case presentation

A 20-year-old Caucasian male patient, who underwent prophylactic colectomy 5 years ago because of classical FAP, was referred to our facility for upper GI screening. For this purpose, we used the FUSE-EGD, which allowed an adequate visualization of Vater's papilla with an easy maneuverability (*Figure 1*). The endoscopist who performed the procedure reported that the FUSE-EGD was superior to standard forward-viewing endoscope in terms of diagnostic accuracy. No adverse event occurred.

Discussion

Classical FAP is an autosomal dominant disease caused by mutations in the Adenomatous Polyposis Coli (*APC*) gene. It is characterized by the presence of hundreds of colorectal adenomas and is also associated to extracolonic manifestations. The malignant potential of colorectal

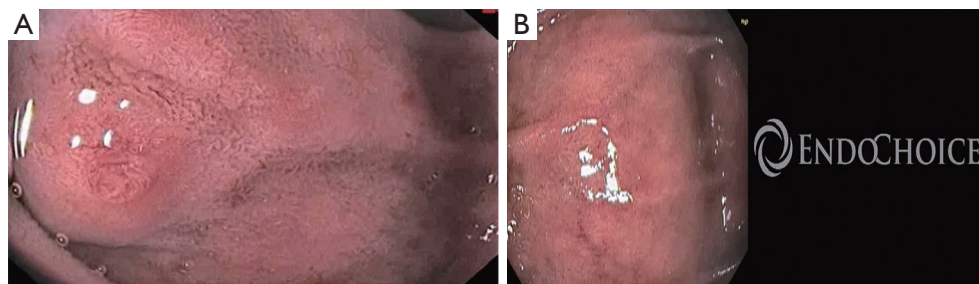


Figure 1 Endoscopic view of the second part of duodenum with FUSE (EndoChoice Inc., Atlanta, GA, USA) esophagogastroduodenoscope. (A) Endoscopic view of the ampulla achieved with the left-side imager, which allowed the endoscopist to perform an accurate examination; (B) second part of duodenum seen at forward view.

adenomas evolves rapidly over time and since all patients with FAP will eventually develop colorectal cancer (CRC), prophylactic colectomy, which is considered the treatment of choice in these patients, should be performed in their second decade of life (2).

Aside from the worrisome CRC risk, duodenal adenomas can also be found in about 50–90% of FAP patients. They usually occur in the ampullary or periampullary area, presenting as flat, whitish, small lesions (<5 mm), difficult to differentiate from the surrounding normal mucosa (3). Although the malignant degeneration of duodenal adenomas is usually slower compared to colonic lesions (adenoma-carcinoma sequence may take up to 15–20 years), endoscopists performing duodenal examination should accurately identify and assess duodenal lesions (1,2). Particular attention should be paid to the detection of large (>1 cm) lesions, as they have been shown to have foci of high-grade dysplasia in up to 50% of patients, and this significantly increases the syndrome's malignant potential (4).

Current guidelines suggest periodical upper GI screening, with the first endoscopic examination to be performed at 25–30 years. Adequate screening should include the evaluation of gastric mucosa with a forward-viewing gastroscope, followed by a side-viewing duodenoscopy in order to ensure an optimal duodenal examination (1,2).

However, the endoscopic examination of duodenum can be tricky; indeed, evaluation of the ampulla can be difficult either because of anatomical reasons (e.g., narrow lumen) or complex maneuverability of the side-viewing endoscope, is time-consuming and painful for the patient. Moreover, it is associated with increased peri-procedural costs, and duodenoscopes are not always available in most endoscopy units. Lastly, concerns about the cleanliness of duodenoscopes have been recently

raised. Therefore, in light of what stated above, it is of main importance to use an endoscope that allows adequate and easy visualization of the duodenum and the ampullary region (5).

The advent of a novel endoscopic platform, Full Spectrum Endoscopy® (FUSE®, EndoChoice Inc., Atlanta, Georgia, USA) that allows a panoramic field of view (245° for gastroscope, 330° for colonoscope), led to a revolution in the examination of GI regions that were previously considered as “invisible”, such as the proximal side of colonic folds/flexures (6). It has been shown in literature that FUSE is superior to conventional colonoscopy, as it is associated to a reduction in overall and proximal colorectal adenoma miss rates (7,8). Similarly, the new upper GI endoscope represents a sophisticated technical innovation, as it allows an accurate inspection of both gastric and duodenal mucosa (including the peri-ampullary region) in a single procedure (9). However, FUSE technology has a limitation, which may negatively influence its widespread use. Such limitation is represented by high costs, which may be difficult to afford as, currently, there are many financial barriers and limited economic resources in the endoscopic field (10).

In conclusion, FAP patients require periodical endoscopic examination for the risk of duodenal adenomas. A combination of forward- and side-viewing endoscopy is necessary to ensure an adequate inspection of the duodenal mucosa. FUSE-EGD represents a potential alternative, as it combines two procedures in one, thus increasing the accuracy and acceptability of upper GI screening in FAP patients.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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