CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187

Available online at: http://www.iajps.com *Research Article*

CAPSULE ENDOSCOPY ITS PRESENT MEDICAL APPLICATIONS AND FUTURE PROSPECTS OF THE ESOPHAGUS, SMALL BOWEL AND COLON

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Article Received: January 2022 **Accepted:** January 2022 **Published:** February 2022

Abstract:

Over a decade has passed since the starter of capsule endoscopy. Throughout this period, tremendous work is done to demonstrate use of CE for the treatment of a number of illness categories in esophagus, small intestine, and colon. Currently, the most prevalent causes for CE include obscure gastrointestinal bleeding, Crohn's illness, polyposis syndromes, and the examination of people having serious celiac illness. Our current research was conducted at Sir Ganga Ram Hospital, Lahore from October 2019 to September 2020. This study will concentrate on the present medical submissions of CE for surveillance of esophagus, small bowel, and colon, as well as a viewpoint on potential CE thoughts and advances.

Keywords: *Capsule Endoscopy, Medical Applications, Esophagus, Small Bowel, And Colon.*

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Please cite this article in press Rabia Latif et al, ***Capsule Endoscopy Its Present Medical Applications And Future Prospects Of The Esophagus, Small Bowel And Colon.,*** *Indo Am. J. P. Sci, 2022; 09(2).*

INTRODUCTION:

Because the launch of capsule endoscopy in 2019, several researches have indicated that this minimally invasive approach has the potential to improve diagnostic results in a number of gastrointestinal disorders. Currently, a variety of CE solutions from various companies are existing [1]. Nonetheless, solitary given M2A video capsule system and the Olympus Endocapsule are now FDA and CE accepted. Capsule systems for examining esophagus, small bowel, and colon are developed. Whereas probable small intestinal stenosis is the contraindication to CE, the patency capsule has been created for such individuals [7]. The conventional CE is the same as the standard CE, but it has a radiofrequency dimension specified that permits it to remain identified by the scanning instrument installed on abdominal wall. Furthermore, it includes a radiopaque covering that allows it to be located inside intestine by means of fluoroscopy [8]. Whenever a stenosis or cancer blocks its path, the angioplasty capsule falls away within 45–85 hrz of intake. Although the capsules may easily chew and swallowed by the number of folks, those with acute dysphagia, a large Zener's diverticulum, drug anxiety, significant gastropareses, and young kids might well have difficulties eating it [9]. When the CE reaches stomach or duodenum, it is removed and endoscope is removed. According to the current analysis, most frequent causes for CE were: obscure GI bleeding (67 percent of interventions), medical signs only (12.7 percent), Crohn's disease (11.5 percent), others (8 percent), neoplastic lesions (4.6 percent), celiac disease (2.8 percent), and normal individuals (0.9 percent). This is crucial to note that CE has got very little investigative performance in individuals with stomach discomfort or diarrhea who do not have anemia or elevated provocative markers [10].

Technical Specifications:

At the point of writing, two FDA also CE qualified capsule systems with plastic disposable capsules were accessible. The given tiny intestinal capsule measures 12! 27 mm in length and weighs less than 4 g. The technology has a 140-degree field of vision and can recognize objects as small as 0.2 mm. The SB2/4 capsule can capture four photos per second. The operational frequency ranges among 7 and 9 hz. The Given capsule for esophageal disorders will be identical magnitude as SB capsule but can capture up to 18 photos per second as it travels down the esophagus.

Relative and Absolute Contraindications:

In people with acute GI blockage, fistulas, or mobility abnormalities, the CE should be used with care. Less than 2% of individuals were reported to have concretion of the CE. Detention happened exclusively in instances with localized pathology inside this context, with little or no retention documented in standard topics or by slight bowel diverticulosis or appendiceal orifices. Capsule retention has indeed been recorded in between 2.6 and 6% of individuals with probable Crohn's disease with unexplained GI hemorrhage. Whereas there is some worry regarding any usage of defibrillators in addition cardiac pacemakers, current research shows that CE may remain conducted securely in those individuals having careful nursing. Furthermore, this was demonstrated that while capsule-induced intermodulation distortion remains possible, it really is uncertain to be medically relevant. Cardiac pacemaker-encouraged CE interference is also conceivable, although it is uncommon and does not result in picture degradation communicated by the capsule [8]. Individuals, on the other hand, really shouldn't receive neuroimaging after having voided CE. Plain radiographs can clearly recognize CE if there is any possibility of retention.

Patient Preparation:

Just after person has eaten for at least 2 hours, he or she is prepared for CE of the esophagus. There are several accepted preparatory procedures for small bowel CE, including fasting first day, a pure liquid diet, 3–5 liters of polyethylene glycol resolution, or usage of mannitol. Furthermore, many specialists advocate taking simethicone preceding taking the pill to prevent intraluminal foam also bubbles. Bowel cleaning for colon CE is critical, and this remains continually being developed in addition it was improved. Medication adherence is high throughout most circumstances considering CE is a minimally invasive device [6].

Clinical Applications:

Eliakim et al. offered outcomes of multicenter study involving detection capabilities of PillCam ESO vs upper endoscopy in adults having progressing reflux illness. In all, 115 individuals were included in the study, with 66 of them having positive esophageal results. CE has a sensitivity and specificity of 93 and 96 percent, correspondingly, for detecting esophageal anomalies. For Barrett's esophagus, the per-protocol sensitivity, precision, predictive values, and kappa coefficient of CE remained 96, 97, 95, and 98 percent, respectively, and for esophagitis, 87, 97, 96, and 93 percent, including both. In this research, all individuals favored CE over traditional upper

endoscopy [7]. In comparison to upper endoscopy, PillCam ESO 2 exhibited the compassion of 99 percent and the specific of 75 percent for identifying probable Barrett's esophagus and esophagitis, and a sensitivity of 82 percent and a specific of 86 percent, correspondingly. In another research, researchers associated the reliability of upper endoscopy to esophageal CE in individuals who are at danger of esophageal squamous cell carcinoma. In all, 69 individuals have been included. CE had a sensitivity of 47 percent for neoplasia diagnosis. The sensitivities, specific, and predictive value of CE remained 64, 87, 78, also 79 percent, respectively, on a per-patient basis. As a result, CE did not appear to be sensitive enough to detect neoplastic lesions in esophagus. To summaries, CE of esophagus seems to remain the convenient and sensitive approach for visualizing Barrett's esophagus and esophagitis, however it is not strong sufficient to identify SCC [8].

Esophageal Varices:

Several researches have been led to evaluate usage of CE in detection of esophageal varices. A previous meta-analysis comprised 9 trials with either a total of 636 patients. CE has a pooled high specificity of 84 and 86 percent for identifying esophageal varices, accordingly. However, CE was ineffective in comparison to upper endoscopy. As a consequence, that one was determined that while esophageal CE may be a feasible choice in contrasting endoscopy in certain cases, it should not be recommended as a substitute for standard upper endoscopy. Through routine upper and lower endoscopy, it must have been determined that among 21 and 39 percent of people had serious intestinal lesions (fig. 1). Preceding research has shown that CE is greater to radiographic tests such as barium follow-through and CT enterorrhaphy. Furthermore, a pooled analysis of 8 potential trials revealed a CE yield of 73% for identifying a bleeding site when relative to push enterostomy. In 93 percent of cases when there was continuous bleeding, CE discovered the source of the hemorrhage. CE found the bleeding source in 45 percent of participants with heme-positive stool and anemia, and in 14 percent of people with chronic overt bleeding [9].

Intestinal Tumors:

The prevalence of intestinal malignancies amongst individuals who have undergone CE for unexplained bleeding varies from 7% to 13%. Adenocarcinomas, lymphomas, GI stromal tumors, neuroendocrine tumors, and metastases are the most prevalent tumors in the small bowel. Additionally, microscopic intestine tumors may be comparatively small and consequently simply missed by CE. CE has been shown to detect so much polyps in those with polyposis diseases than small bowel follow-up.

Future Concepts of Capsule Endoscopy:

Small bowel imaging is still maximum common finding for CE. Comparing investigations here among Offered Imaging and Olympus CE have revealed that both technologies have comparable efficacies. Novel capsule devices are now being developed to permit targeted medication delivery or perhaps even direct hemostatic treatment. The outcomes of different pilot projects are eagerly anticipated since they will open up original avenues for CE. The colon capsule, inside its present incarnation, is not a good alternative colonoscopy. CE treatment costs are quite costly, and extensive bowel pretreatment is required to achieve good polyp identification rates. Furthermore, CE is not precise sufficient to forecast the histology of colorectal polyps, therefore every positive CE result must be confirmed by standard endoscopy [10].

CONCLUSION:

Since its release over 13 years ago, CE has been demonstrated to be effective in several trials. The most common reasons for CE treatments include still unclear GI bleeding, clinical signs exclusively, and probable Crohn's illness. Several researches have indicated that CE is preferable than radiologic treatments and push enteroscopy for all these procedures. In the event of a positive CE discovery, balloon-assisted endoscopy allows for the use of focused biopsies or treatment. Previously, CE was simply the diagnostic test, and capsule movement remained inactive in relation to stomach motility. Novel capsule devices may have a high potential for nonsurgical diagnostics and focused treatment in the future. Furthermore, capsule mobility will be actively regulated, offering up new opportunities for advanced specialized assessment and focused therapy.

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