iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** III **Month of publication:** March 2022

DOI: https://doi.org/10.22214/ijraset.2022.40910

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue III Mar 2022- Available at www.ijraset.com

Videocapsule Endoscopy in the Diagnosis of Gastrointestinal Bleeding

Makhmonov Lutfulla Saydullaevich[1], Karimov Tulkin Negmatovich[2], Babakalonov Shukhrat Ibragimovich[3], Ibragimova Dilfuza Narzikulovna[4]
[1]*Head of the Department of Hematology, Samarkand Medical Institute.*
[2]*Deputy Head of the Regional Multidisciplinary Medical Center, Surgeon, practitioner*
[3]*Head of the department of the regional multidisciplinary medical center.*
[4]*Samarkand Medical Institute, Teacher of the, Department of Obstetrics and Gynecology with a course in neonatology*

***Abstract:** This article examines the possibilities of video capsule endoscopy in the diagnosis of bleeding from the gastrointestinal tract, the study of the causes of this disease and methods of its treatment using effective methods.*
***Keywords:** video capsule endoscopy, small intestine, gastrointestinal bleeding*

I. INTRODUCTION

Until recently, the small intestine remained “terra incognita” on the map of the gastrointestinal tract. the imperfection of the research methods determined the low level of diagnosis of various pathological conditions, in particular small intestinal bleeding. the difficulties of its examination were due to anatomical (significant distance from natural openings, large length) and physiological (active peristalsis) reasons. the exception was the terminal ileum, retrogradely examined during ileocolonoscopy, and the initial 90–150 cm of the jejunum accessible only with special “push” endoscopes [1, 2, 3].

II. MAIN PART

For a long time, the only method for examining the small intestine was its X-ray contrast study with barium sulfate, which could not fully satisfy clinicians. despite the fact that X-ray examination is able to detect strictures and tumor lesions of the small intestine, its sensitivity in the diagnosis of bleeding was no more than 5%. X-ray it is impossible to obtain a detailed image of the mucous membrane, especially flat vascular lesions (angiodysplasia), which are one of the most common causes of "hidden" bleeding from the organs of the gastrointestinal tract [4]. the possibilities of other methods of radiation diagnostics (computed tomography, magnetic resonance imaging) are also limited in providing complete information about the state of the small intestine wall. Introduced into clinical practice at the turn of the century and continuously developing in the future, video capsule endoscopy (VCE) opened a new chapter in the study of the small intestine [5]. it was this revolutionary technique that for the first time made it possible to obtain a high-quality endoscopic image of the entire small intestine without performing surgical intervention and radiation exposure. the use of the video capsule in daily clinical practice has identified various groups of diseases of the small intestine (inflammatory, vascular, neoplastic, iatrogenic), often complicated by bleeding, and stimulated the development and implementation of other diagnostic and therapeutic methods, such as double-balloon enteroscopy, magnetic resonance and computed tomography enterography .

The purpose of the work - is to present the possibilities of using video capsule endoscopy in the diagnosis of gastrointestinal bleeding.

Material and methods - the results of the use of VCE at the clinical base of the Department of Surgery named after A.I. n.a. monastery szGmu named after I.I. Mechnikov in Clinical Hospital No. 122 of the Federal Medical and Biological Agency of Russia for the period from April 2010 to December 2011, 32 patients (17 men and 15 women) were examined. the mean age of the patients was 46±15 years (M±σ) (from 19 to 73 years). indications for examination were anemia and "occult" gastrointestinal bleeding (in 4 patients), abdominal pain (in 14), abdominal pain in combination with signs of intestinal passage disorder (in 3), suspicion of Crohn's disease (in 6), assessment of the condition of the small intestine with proven Crohn's disease after resection of the intestine (2 patients). All patients underwent endoscopic examination of the upper and lower parts of the digestive tract before performing capsule endoscopy. In the work, we used an EC type 1 endocapsule (Olympus). The video capsule is a disposable device that is swallowed and then advanced through the gastrointestinal tract, making a video image of the mucosa.

To conduct the study, the capsule endoscopy system includes, in addition to the endocapsule, a recording device with attached external antennas, a real-time viewer, and a configured workstation with software for viewing and interpreting images (Fig. 1). The principle of operation of the capsule is to transfer high-quality digital images of the small intestine to a recording device located on the patient's body during the entire study. The capsule itself consists of a body with an optical window, an objective lens, 6 LEDs, a matrix, a battery and a transmitter. the capsule has the following characteristics: size 26×11 mm, weight 3.7 g, shoots at a frequency of 2 fps, transmits about 55,000 video images within 8 hours of operation, battery charge time is 8 hours, the minimum size detail is about 0.1 mm, with a maximum eightfold magnification, the inspection depth is from 1 to 30 mm, and the viewing angle is 140 [5].
Days before the study, he was fasted for 12 hours before the procedure, the night before he performed oral lavage of the intestine with a solution of polyethylene glycol in the amount of 2 liters, and on the day of the study he took another 1 liter of the solution in the morning. half an hour before swallowing the capsule, it was recommended to drink 50 ml of espumizan solution. prokinetics were used as premedication in persons with reduced gastric motor-evacuation function (10 mg metoclopramide). metoclopramide reduces the gastric transit time of the capsule and increases the likelihood of successful examination of the small intestine [6]. on the contrary, the use of erythromycin does not have a significant effect on the propulsive motility of the small intestine [1, 7]. During the examination, patients were allowed to take clear, uncolored liquids 2 hours after swallowing the capsule, and after another 4 hours, they were allowed to take “light” food. 31 patients swallowed the capsule on their own, and only one patient had the capsule delivered to the duodenum using a gastroduodenoscope. The end of the study was the detection of the capsule in the colon using a real-time video signal viewer. after the transfer of the recorded image from the recording device to the workstation was completed, the endoscopic picture was evaluated the next day.

Fig. 1. A – view of the endocapsule, B – endocapsule, C – recording device with attached external antennas and real-time viewer, D – view of the workstation window for viewing and interpreting images

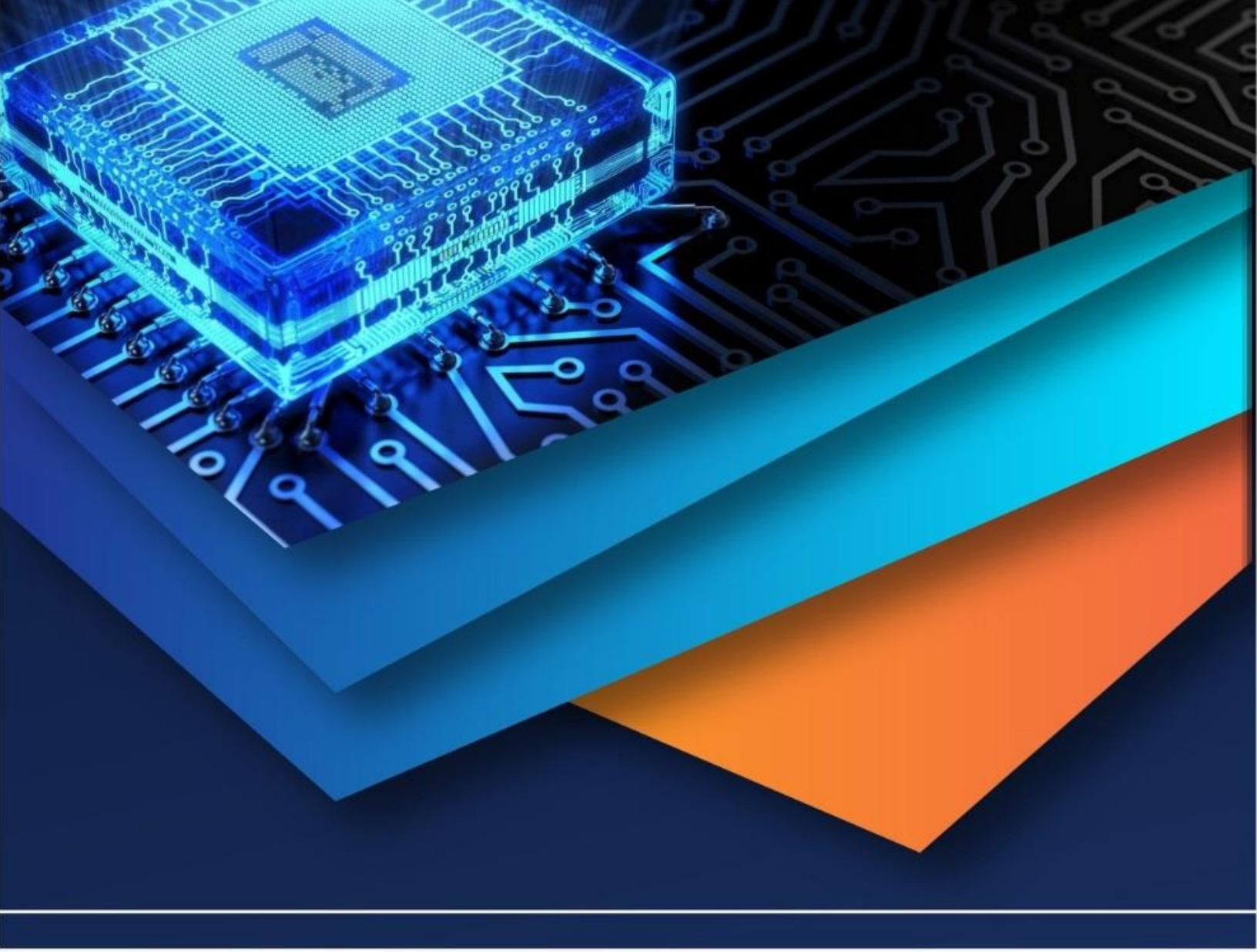
Results and discussion a complete examination of the small intestine was performed in 30 of 32 patients. in 2 people, the study was not completed completely due to a long delay of the capsule (at the level of the gastroduodenal segment in one subject and in the area of interintestinal anastomosis in another), by the time the batteries were charged, it remained in the small intestine. the average duration of the passage of the capsule through the stomach was 41±26 min (M±σ) (from 11 to 75 min). In 30 patients the capsule migrated through the ileocecal valve during the study period. the average duration of the passage through the small intestine (from the pyloric canal to the ileocecal valve) was 307±115 min (M±σ) (from 185 to 443 min). in 4 patients, the passage of the capsule through the intestine was accompanied by pathological pendulum movements in the duodenum and the initial part of the jejunum with a retrograde return in 2 people to the stomach. of them, 3 changes in the intestinal mucosa were not noted, and in one, a stenosing lesion of the jejunum was detected in Crohn's disease. Out of 32 patients, pathological changes in the mucous membrane of the small intestine were detected in 17 (53.1%): neoplasms of the small intestine - 2 (adenocarcinoma (bleeding) - 1, leiomyosarcoma (bleeding) - 1); Crohn's disease - 6; angiodysplasia - 2; celiac disease - 1; portal hypertensive enteropathy - 1; intestinal lymphangiectasia - 2; lymphofollicular hyperplasia - 1; polyp of the small intestine - 1; cicatricial changes in the area of intestinal anastomosis - 1. Of the 4 patients with signs of "hidden" gastrointestinal bleeding, 2 had active bleeding into the lumen of the small intestine, defined by the capsule. in both cases, the source of bleeding was located in the jejunum. The cause of one of them was established on the basis of the evaluation of images obtained by the capsule (adenocarcinoma), in the other case, the source of bleeding was determined only intraoperatively (leiomyosarcoma) (Fig. 2.). Diseases were histologically verified after morphological examination of the surgical material. In other cases, the causes of "hidden" bleeding, manifesting as a picture of recurrent anemia, were erosion-ulcers of the terminal ileum in Crohn's disease - in one examined patient, and in another case - portal enteropathy in a patient with liver cirrhosis. in addition to clinically obvious causes of "hidden" gastrointestinal bleeding, in 2 cases, in the absence of any specific complaints, we accidentally detected 2 angiodysplasia of the mucosa in patients examined for abdominal discomfort. “Occult” gastrointestinal bleeding (FFB) is the leading indication for capsule endoscopy. Thus, in approximately 70-80% of patients, capsule endoscopy is performed in connection with "occult" bleeding from the digestive tract [8, 9, 10]. This condition is defined as the failure to identify the source of ongoing or recurrent gastrointestinal bleeding after standard endoscopic examination methods of gastroduodenoscopy and colonoscopy. The share of "hidden" fatty acids accounts for up to 5% of the total number of bleeding of the digestive system. most of the published studies relating to the initial period of study of capsule endoscopy provide data on the high, although widely variable, diagnostic value of this method in occult bleeding (within 38-93%, on average 75-80% in most studies) [11]. A However, it should be borne in mind that these studies concentrated selectively selected patients with a long history of unclear biliary biliary tract, low hemoglobin values at the time of examination, who underwent a huge number of previous endoscopic examinations with a negative result. Subsequent studies conducted on large patient populations showed a lower sensitivity of the method (about 50%) [12]. sZhkk, in turn, are divided into “hidden-explicit”, in the clinical picture of which melena or hematochezia is noted, and "Hidden-secret", manifesting relapses of iron deficiency anemia or positive results of a fecal occult blood test. Thus, according to Z.Fireman, the use of an endocapsule is most justified during the period of obvious manifestations of latent hemorrhage and reveals bleeding in 92% of cases [13]. while with occult bleeding only in 44%, and in the long-term period after bleeding even less - in 12% [13, 14]. diagnosis of tumors of the small intestine is a new field of application for capsule endoscopy. Until the introduction of the endovideocapsule into clinical practice, tumors of the small intestine were considered a rare disease, accounting for 1 to 3% of all primary gastrointestinal tumors [15]. So, according to X-ray studies, they were determined in approximately 1% of the examined. As a rule, they are recognized at a late stage with the development of complications (intestinal obstruction, bleeding) (Fig. 3), or accidentally during laparotomy or biopsy. The diagnostic rate has changed since the introduction of capsule endoscopy. In some reports, the detection rate of tumors of the small intestine reaches 6-9%, far exceeding previously expected results [16, 17, 18]. In 80% of cases, the indication for the detection of a tumor of the small intestine is occult bleeding or iron deficiency anemia. Of the diagnosed formations, 60% were malignant, consisting of adenocarcinoma, carcinoid, sarcoma, melanoma, and lymphoma. benign tumors occurred in 40% and were represented by gastrointestinal stromal tumors, hemangiomas, hamartomas and adenomas. therefore, in the case of unclear gastrointestinal bleeding, the possibility of a tumor must be considered and the patient is required to undergo capsular enteroscopy [6, 19].

III. CONCLUSIONS

Videocapsule endoscopy makes it possible to obtain previously inaccessible data on the state of the small intestine and bring the diagnostic program to a new qualitative level. In patients with a clinical picture of anemia and gastrointestinal bleeding, video capsule endoscopy is recommended as a third diagnostic method in case of negative results of gastroduodenoscopy and colonoscopy. The disadvantages of video capsule endoscopy are: the lack of remote control, the phenomenon of image skipping, difficulties in determining the size and localization of pathological changes, the impossibility of biopsy and therapeutic measures.

REDERENCES

[1] The effect of erythromycin on video capsule endos- copy intestinal-transit time / G. R. Caddy [et al.] // Gastrointest Endosc. – 2006 Feb. – Vol. 63, N 2. – P. 262–66.
[2] Delvaux M. Capsule endoscopy in 2005: facts and- perspectives / M. Delvaux, G. Gerard // Best Pract Res Clin Gastroenterol. – 2006 Feb. – Vol. 20, N 1. – P. 23–39.
[3] Small bowel cancer: epidemiological and clinical characteristics from a population-based registry / J. A. Di Sarjo [et al.] // Am J Gastroenterol. – 1994 May. – Vol. 89, N 5. – P. 699–701.
[4] Gay G. J. Enteroscopy in small intestinal inflamma- tory diseases / G. J. Gay, J. S. Delmotte // Gastrointest Endosc Clin N Am. – 1999 Jan. – Vol. 9,N 1. – P. 115–123.
[5] Wireless capsule endoscopy / G. Iddan [et al.] // Na- ture. – 2000 May. – Vol. 405, N 6785. – P. 417.
[6] Selby W. Complete small-bowel transit in patients undergoing capsule endoscopy: determining factors and improvement with metoclopramide / W. Selby // Gastro- intest Endosc. – 2005 Jan. – Vol. 61, N 1. – P. 80–85.
[7] Liangpunsakul S. Comparison of wireless capsule endoscopy and conventional radiologic methodsin the diagnosis of small bowel disease / S. Liangpunsakul, D. D. Maglinte, D. K. Rex // Gastrointest Endosc Clin N Am. – 2004 Jan. – Vol. 14, N 1. – P. 43–50.
[8] Usefulness of oral video push enteroscopy in Crohn's disease / E. Perez-Cuadrado [et al.] // Endoscopy. – 1997 Oct. – Vol. 29, N 8. – P. 745–747.
[9] Feasibility and diagnostic utility of video capsule en- doscopy for the detection of small bowel polyps in pa- tients with hereditary polyposis syndromes / K. Schul- mann [et al.] // Am J Gastroenterol. – 2005 Jan. – Vol. 100, N 1. – P. 27–37.
[10] Selby W. Complete small-bowel transit in patients undergoing capsule endoscopy: determining factors and improvement with metoclopramide / W. Selby // Gas- trointest Endosc. – 2005 Jan. – Vol. 61, N 1. – P. 80–85.
[11] The effect of erythromycin on video capsule endos- copy intestinal-transit time / G. R. Caddy [et al.] // Gastrointest Endosc. – 2006 Feb. – Vol. 63, N 2. – P. 262–266.
[12] Delvaux M. Capsule endoscopy in 2005: facts and perspectives / M. Delvaux, G. Gerard // Best Pract Res Clin Gastroenterol. – 2006 Feb. – Vol. 20, N 1. – P. 23–39.
[13] Fireman Z. The light from the beginning to the end of the tunnel / Z. Fireman // Gastroenterology. – 2004 Mar. – Vol. 126, N 3. – P. 914–916.
[14] Small bowel cancer: epidemiological and clinical characteristics from a population-based registry / J. A. DiSario [et al.] // Am J Gastroenterol. – 1994 May. – Vol. 89, N 5. – P. 699–701.
[15] Gay G. J. Enteroscopy in small intestinal inflamma- tory diseases / G. J. Gay, J. S. Delmotte // Gastrointest Endosc Clin N Am. – 1999 Jan. – Vol. 9, N 1. – P. 115–123.
[16] Wireless capsule endoscopy / G. Iddan [et al.] // Nature. – 2000 May. – Vol. 405, N 6785. – P. 417.
[17] Liangpunsakul S. Comparison of wireless capsule endoscopy and conventional radiologic methodsin the diagnosis of small bowel disease / S. Liangpunsakul, D.
[18] Maglinte, D. K. Rex // Gastrointest Endosc Clin N Am. – 2004 Jan. – Vol. 14, N 1. – P. 43–50.
[19] Usefulness oforal video push enteroscopy in Crohn's disease / E. Perez-Cuadrado [et al.] // Endoscopy. – 1997 Oct. – Vol. 29, N 8. – P. 745–747.
[20] Feasibility and diagnostic utility of video capsule en- doscopy for the detection of small bowel polyps in pa- tients with hereditary polyposis syndromes / K. Schulmann [et al.] // Am J Gastroenterol. – 2005 Jan. – Vol. 100, N 1. – P. 27–37.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY