

# Diagnostic Efficacy and Safety of Capsule Endoscopy in Obscure Gastrointestinal Bleeding: An Experience from Pakistan

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## ABSTRACT

**Background:** Obscure gastrointestinal bleeding (OGIB) accounts for 5% of all cases of gastrointestinal bleeding (GIB) and is mostly due to lesions of small bowel. The CE (capsule endoscopy) that allows non-invasive visualization of small bowel mucosa has transformed OGIB evaluation.

**Aim:** To assess the efficacy of capsule endoscopy among patients with obscure gastrointestinal bleeding.

**Method:** A cross-sectional study was carried out at Islam Teaching Hospital Sialkot and Shaikh Zayed Hospital, Lahore from 1<sup>st</sup> July 2017 to 31<sup>st</sup> December 2017. Twenty one patients presenting with obscure gastrointestinal bleeding were included in the study. Patients with history of severe intestinal obstruction were excluded. Activation of capsule was made before ingesting and recording was started.

**Results:** Among 21 patients, 52.4% were males and mean age of the patients was 55.26±18.7 years. 66.7% patients had occult gastrointestinal bleeding, mean transit time from stomach to duodenum was 51.84±50.15 minutes and mean intestinal transit time was 289.8±75.57 minutes. As per upper GI endoscopy, 14.3% patients had pangastritis and according to lower GI endoscopy, 23.8% patients had arteriovenous malformation. Among patients, 28.7% had ulceration & bleeding distal ileum and 23.9% had non bleeding arteriovenous malformations.

**Conclusion:** Study concluded that capsule endoscopy is safe and effective examination for small bowel and should be used for patients with obscure gastrointestinal bleeding.

**Keywords:** Efficacy, Capsule endoscopy, Obscure, GI bleeding

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## INTRODUCTION

Obscure gastrointestinal bleeding is described like bleeding of unidentified origin that continues or reappears after negative assessments including lower and upper endoscopies. Obscure gastrointestinal bleeding accounts for 5 percent of all gastrointestinal bleeding cases<sup>1</sup>.

Obscure gastrointestinal bleeding is the infrequent appearance of GI bleeding which can be tricky to identify and remains to be a demanding problem faced by the gastroenterologists. It was found that virtually 75% of all OGIB causes have origin in small bowel and in such cases, patients require further diagnostic procedures, long hospital stay, need extra blood transfusion and increased healthcare expenditure as compared to the patients with colonic or upper gastrointestinal bleeding<sup>2</sup>.

Obscure GI bleeding can further be classified into overt or occult bleeding<sup>3</sup>. The overt bleeding is described as apparent GIB that mostly presents like hematochezia or melena. On the contrary, occult bleeding is invisible for doctor and patient. These bleeds could be related to iron deficiency anemia (IDA) and could manifest like positive fecal blood examination<sup>4</sup>.

The reason of OGIB is mostly a lesion found in small bowel but also comprises lesion which were ignored during conservative endoscopy, either due to truly missed lesions or intermittent bleeding. A most occurring problem in obscure GIB is whether to carry out constant examinations or to utilize a conventional supportive technique (stopping NSAIDS, blood transfusion or supplementing iron)<sup>5</sup>.

Small bowel, however, currently is within GI endoscopy reach, due to advancements in technology in

the endoscopy. Consequently, novel small bowel endoscopies comprising capsule endoscopy, single- and double-balloon enteroscopy, recently play a significant role in assessing and managing obscure GI bleeding<sup>1</sup>.

Capsule endoscopy is latest technology which helps in visualizing small bowel non-invasively. During 1981, Dr. Gavriet made an apparatus which name was mouth to anus (M2A) capsule and this device had camera to see small intestine after being ingested by patient which was later transformed and named Pillcam. The pill size vitamin capsule has great potential like a noninvasive examination of the small bowel pathologies. From the time of its introduction during 2001, it has great impact along with widening the investigative yields of the small bowel deformities due to its capability to evaluate small bowel mucosa thoroughly<sup>6</sup>.

The capsule endoscopy is mostly used for the diagnosis of obscure gastrointestinal bleed when both colonoscopy and upper gastrointestinal endoscopy are non-conclusive. The capsule endoscopy yield for picking-up lesions of small bowel is greater when compared with radiological and several other endoscopic techniques. Other sign is to assess for CD (celiac diseases) among patients when biopsies and upper gastrointestinal endoscopy is uncertain and also to assess the involvement of distal small bowel as features of malabsorptions and CD as scalloping of folds, layering of folds, mosaic pattern and villous atrophy could be investigated through capsule endoscopy<sup>7</sup>.

Capsule endoscopy is a modern diagnostic method which assists in the assessment of complete small bowel which is not possible with conservative endoscopy. Its noninvasive type along with its recognized elevated specificity and sensitivity has enhanced its utilization most significantly in OGIB<sup>8</sup>.

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Also, the capsule endoscopy has considerably higher investigative yield among OGIB patients than do alternative investigative endoscopic or radiological modalities, comprising small bowel follow-through and push enteroscopy (excluding the balloon-assisted enteroscopy). Therefore, capsule endoscopy is broadly utilized as first-line investigative modality for obscure gastrointestinal bleeding<sup>1</sup>.

## MATERIAL AND METHODS

A cross-sectional study was carried out at Islam Teaching Hospital Sialkot and Shaikh Zayed Hospital, Lahore from 1<sup>st</sup> July 2017 to 31<sup>st</sup> December 2017. During study twenty one consecutive patients with OGIB were enrolled. Patients with history of severe intestinal obstruction were not included. All the patients had endoscopic investigation of the digestive tract including upper GI endoscopy and colonoscopy with conservative examination of the ileum. Other investigative examinations included small bowel researches, radioisotope and CT scans. Entire medical history, blood transfusions history and blood picture were recorded. Patients were advised to ingest a capsule with water after the overnight fast and bowel preparation utilizing 30ml of sodium picosulphate on afternoon before procedure. Endocapsule (Olympus MAJ-1469) was utilized during study. Activation of capsule was made before ingesting and recording was started. Examination was called as complete when capsule reached caecum or not complete if the capsule failed to enter caecum or battery life was exhausted. After this procedure, patients were released with special instructions to check the stools for the passage of capsule. The recordings were shifted to computer database. Computer recordings were read and eventually results were explained. By diagnostic efficacy we mean that if more than 90% of patients are diagnosed then it is highly efficacious. Data was entered and analysed in SPSS-20.

## RESULTS

Table 1 depicts that among 21 patients, the mean age was 55.26±18.7 years. Among 21 patients, 11(52.4%) were males and 10 (47.6%) were females. Result shows that among 21 patients, 6 (28.6%) had malena, 14 (66.7%) occult GIB and 1 (4.8%) patient had non-specific abdominal pain. Among patients, the mean transit time from stomach to duodenum was 51.84±50.15 minutes and mean intestinal transit time was 289.8±75.57 minutes. Out of 21 patients, 16(76.2%) had complete examination and 5 (23.8%) had incomplete examinations. According to upper GI endoscopy, 16(76.3%) patients were normal, 3(14.3%) had pangastritis, 1(4.7%) had oesophageal varices and 1(4.7%) patient had vascular ectasia. Similarly according to lower GI endoscopy, 12(57.1%) patients were normal, 5 (23.8%) had arteriovenous malformation (AVM), 1(4.7%) had sessile polyp in the rectum, 1(4.7%) had blood in the colon, 1(4.7%) had blood in the terminal ileum and 1(4.7%) patient had multiple polyps in the colon. According to indications, 6 patients (28.6%) have malena, 14 patients (66.7%) have occult GIB and 1 patient (4.7%) have non-specific abdominal pain (Table 2).

Table 3 indicates that among 21 patients, 6(28.7%) had ulceration & bleeding from distal ileum, 5(23.9%) had non bleeding AVMs, 3(14.4%) were normal, 2(9.5%) had bleeding AVM, 1(4.7%) had gastropathy and duodenopathy, 1(4.7%) had multiple bleeding areas in small bowel, 1(4.7%) had multiple polyps in small bowel, 1(4.7%) had hemobilia and 1(4.7%) patient had old blood in ileum.

Table 2: Indications of patients (n=21)

| Indication                  | No. | %    |
|-----------------------------|-----|------|
| Malena                      | 6   | 28.6 |
| Occult GIB                  | 14  | 66.7 |
| Non-specific abdominal pain | 1   | 4.7  |

Table 3: Capsule endoscopy findings (n=21)

| Findings                               | No. | %    |
|--|-----|------|
| Ulceration & bleeding distal ileum     | 6   | 28.7 |
| Non bleeding AVMs                      | 5   | 23.9 |
| Normal                                 | 3   | 14.4 |
| Bleeding AVM                           | 2   | 9.5  |
| Gastropathy and duodenopathy           | 1   | 4.7  |
| Multiple bleeding areas in small bowel | 1   | 4.7  |
| Multiple polyps in small bowel         | 1   | 4.7  |
| Hemobilia                              | 1   | 4.7  |
| Old blood in ileum                     | 1   | 4.7  |

Table 1: Characteristics of patients (n=21)

| Variable  | No.         | %    |
|---|-------------|------|
| Age (mean±SD)                                       | 55.26±18.7  |      |
| <b>Gender</b>                                       |             |      |
| Male  | 11          | 52.4 |
| Female  | 10          | 47.6 |
| <b>Indication</b>                                   |             |      |
| Malena  | 6           | 28.6 |
| Occult GIB  | 14          | 66.7 |
| Non-specific abdominal pain                         | 1           | 4.8  |
| Mean transit time from stomach to duodenum (minute) | 51.84±50.15 |      |
| Mean intestinal transit time (min)                  | 289.8±75.57 |      |
| <b>Examination completed</b>                        |             |      |
| Complete  | 16          | 76.2 |
| Incomplete  | 5           | 23.8 |
| <b>Upper GI endoscopy</b>                           |             |      |
| Normal  | 16          | 76.3 |
| Pangastritis  | 3           | 14.3 |
| Oesophageal varices                                 | 1           | 4.7  |
| Vascular ectasia                                    | 1           | 4.7  |
| <b>Lower GI endoscopy</b>                           |             |      |
| Normal  | 12          | 57.1 |
| Arteriovenous malformation (AVM)                    | 5           | 23.8 |
| Sessile polyp in the rectum                         | 1           | 4.7  |
| Blood in the colon                                  | 1           | 4.7  |
| Blood in the terminal ileum                         | 1           | 4.7  |
| Multiple polyps in the colon                        | 1           | 4.7  |

## DISCUSSION

Capsule endoscopy is a modern diagnostic method which assists in the assessment of complete small bowel which is not possible with conservative endoscopy. It is most useful diagnostic tool for patients with obscure gastrointestinal bleeding. Present study was carried out to assess the efficacy of capsule endoscopy among patients with obscure gastrointestinal bleeding. During study a group of twenty

one patient was included. Age is a leading factor because with increasing age several health problems occur among population. Study found that mean age of the patients was 55.26 years. A similar study carried out by Malik and collaborators<sup>7</sup> also showed comparable results that mean age of the patients was 52.10 years.

As far as gender is concerned, study demonstrated that more than half (52.4%) of the patients were males and 47.6% were female patients. This is in contrast to the finding of study undertaken by Ribeiro and associates<sup>2</sup> who reported that more than half (60%) of patients were females and 40.0% were male patients.

It was found during study that 28.6% patients had melena, majority (66.7%) had occult GIB and 4.8% patients had non-specific abdominal pain. While the finding of a study performed by Malik and collaborators<sup>7</sup> also highlighted that most of the patients (75%) had occult GIB and 13.0% had abdominal pain and 12% had chronic diarrhea.

Study indicated that mean transit time from stomach to duodenum was 51.84±50.15 minutes and mean intestinal transit time was 289.8±75.57 minutes while examination was completed among more than three quarter of patients. Study further revealed that according to upper GI endoscopy majority of patients were normal while a few of them had pancreatitis, oesophageal varices and vascular ectasia. Likewise as per lower GI endoscopy, more than half of patients were normal while remaining proportion had AVM, sessile polyp in the rectum, blood in the colon, blood in the terminal ileum and multiple polyps in the colon.

When the capsule endoscopy findings were assessed among patients, study showed that majority (28.7%) of patients had ulceration & bleeding distal ileum, followed by non bleeding AVMs (23.9%), normal (14.4%), bleeding AVM (9.5%), gastropathy and duodenopathy (4.7%), multiple bleeding areas in small bowel (4.7%), multiple polyps in small bowel (4.7%), hemobilia (4.7%) and old blood in ileum (4.7%). The results of the study conducted by Qureshi and teammates<sup>6</sup> are almost comparable with our study results who demonstrated that majority (25%) of patients had ulceration & bleeding distal ileum, followed by non bleeding AVMs (21.4%), normal (21.4%), bleeding AVM (10.7%), gastropathy and duodenopathy (7.1%), multiple bleeding areas in small bowel (3.6%), multiple

polyps in small bowel (3.6%), hemobilia (3.6%) and old blood in ileum (3.6%).

Few of the limitations in the use of capsule endoscopy include capsule retention and aspiration which occur in only 25% of patients apart from this it is a relatively safe procedure.

## CONCLUSION

Capsule endoscopy has considerably higher investigative yield among OGIB patients. Present study assessed the efficacy of capsule endoscopy among patients with obscure gastrointestinal bleeding. Study concluded that capsule endoscopy is safe and effective examination for small bowel and should be used for patients with obscure gastrointestinal bleeding. Further studies are needed on vast level to know the efficacy of capsule endoscopy.

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