

ORIGINAL RESEARCH ARTICLE

DOUBLE BALLOON ENTEROSCOPY: OUR INITIAL EXPERIENCE AT UNIVERSITY TEACHING HOSPITAL

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ABSTRACT

Background: Double Balloon Enteroscopy (DBE) is a standard method of assessing small bowel pathologies. It acts as a complimentary diagnostic tool in evaluating diseases of entire small bowel with varying diagnostic yields. These days, most of the advanced endoscopic centers provide DBE services. Here, we aimed to evaluate our initial experience in performing the DBE procedures in endoscopic unit of department of medical gastroenterology.

Methods: Retrospective review of prospectively maintained medical records of all the patients undergoing DBE procedure over two years period (between Jan 2018- Dec 2020) were analyzed. The general demographics, indication, insertion routes, findings and any associated complications reported.

Results: During study period, 50 DBE diagnostic procedures were performed. Youngest was 16years while oldest patient was 83years. Commonest indication was small bowel bleeding (28%, 14) followed by iron deficiency anemia in 24% (12). In 48% (24) complete procedure by both anterograde (oral) and retrograde (anal) route was performed. Commonest finding was small bowel ulcer in 16 patients followed by erosions (5) and diverticulum (5). Only in one patient, the vascular malformation was revealed. Commonest procedure related complication was abdominal discomfort (50%) which resolved on its own. There was no major complication and no procedure related mortality.

Conclusions: DBE is a safe diagnostic procedure in evaluating small bowel pathologies; the commonest usefulness is in patients with either occult or overt SBB. However, the procedural complexity and long procedure times are still considered as obstacles in incorporating the DBE as routine services.

INTRODUCTION

Flexible enteroscopy by the use of Double Balloon Enteroscopy (DBE) has become the standard and established method of assessing small bowel pathologies being practiced worldwide.¹ A very important tool in evaluating obscure gastrointestinal bleeding, DBE has also been used in evaluating other small bowel pathologies. Besides being useful for diagnostic purposes, DBE has also been useful in therapeutic procedures.² Diagnostic and therapeutic yields of DBE have been varying in literature. However, after appropriate patient selection majority of publications have reported diagnostic yield ranging from 43% to 81%.³ Many factors like endoscopic skill of the endoscopist, proper instrument selection as well as proper patient selection leads to successful DBE procedure. Over the years, because of the technical developments and improvements and availability of hands on training opportunities, DBE is now available in most of the tertiary level hospitals having advanced diagnostic and therapeutic endoscopic services.

Our hospital is a tertiary level University Teaching Hospital having separate gastrointestinal endoscopy unit under Department of Medical Gastroenterology performing various diagnostic and therapeutic endoscopic procedures. Few years

back, DBE was introduced in our endoscopy unit. Since then, we have been routinely performing DBE procedures although majority of them are for diagnostic purpose. In this study, we aimed to evaluate our initial experience with DBE in evaluating small bowel pathologies.

METHODS

Double Balloon Enteroscopy (DBE) was introduced in our endoscopy unit in January 2018 and the DBE system installed in our department is from Fujinon system. Afterwards, the DBE procedure is routinely being performed by the Department of Gastroenterology. As there are only limited centers in Nepal performing the DBE procedure, our unit receives large number of patient referrals from all over the country. We have been following the standard protocol for performing the DBE procedures. Carbon dioxide (CO₂) is used for insufflation during the procedure. For complete and retrograde insertion procedure, complete bowel preparation is performed with polyethylene glycol (PEG) solution while if only anterograde insertion is planned then patient is prepared only with overnight fasting. The choice of insertion route is based on the clinical presentation and also guided by the other available investigations. The procedures were performed under

monitored conscious sedation.

From indications to procedure details to post procedure complication are recorded in prospectively maintained medical records. For this review, all the prospectively maintained medical records of the patients undergoing DBE between January 2018 to December 2020 (2 years period) in our endoscopy unit were studied. All of the patients undergoing DBE procedures were included. Approval from the Department was taken for the analysis. Patient's identification was kept anonymous. Necessary information like age distribution, indications, insertion route, findings and complications were retrieved from those medical records and presented in the results in the form of tables or charts as necessary. As the results expressed in this series were all descriptive data, no statistical test was deemed necessary to apply.

RESULTS

Total 50 DBE procedures were performed over 2 years period (between Jan 2018- Dec 2020). Majority of the patients were male. The youngest patient in our series was 16 years while the oldest patient was 83 years (Table 1).

Table 1: Demographic profile

Total Patients	50
Age (Range in years)	16- 83
Gender (M: F)	30:20
Referral pattern (In hospital: Referred)	28:22

Total 22 (44%) of patients were referred from other centers for the procedure while remaining patients were admitted in hospital patients. Obscure gastrointestinal (GI) bleeding followed by iron deficiency anemia (IDA) and chronic pain abdomen were the commonest indications for performing the DBE procedure (Table 2).

Table 2: Indications and preprocedural evaluation

S.N.	Indications	N= 50(%)	Preprocedural evaluation	N
1	Obscure GI bleeding	14 (28%)	UGI Endoscopy	50
2	Iron deficiency anemia	12 (24%)	Colonoscopy	50
3	Chronic abdominal pain	10 (20%)	MDCT abdomen	35
4	Chronic diarrhea	6 (12%)		
5	Recurrent SAIO	5 (10%)		
6	Chronic Pain abdomen with anemia	3 (6%)		

Total five 5 patients had presented with frequent episodes of partial small bowel obstruction without obvious etiology in radiological imaging. In our series, all most all patients had undergone both endoscopy and colonoscopy prior to undergoing the DBE procedure while some selected patients had also been evaluated by multi-detector computed tomography (MDCT) imaging.

Based on the patient's clinical symptoms and the available other investigations, choice of insertion was decided and in only 24 (48%) patients, complete DBE procedure was performed (Table 3).

Table 3: Insertion route

S.N.	Insertion route	N= 50 (% age)
1	Anterograde	17 (34%)
2	Retrograde	9 (18%)
3	Combined	24 (48%)

In remaining patients either anterograde or retrograde route was performed. Most of the findings were located in the jejunum or ileum (Table 4) while in 2 patients, the findings were in distal duodenum (ulcers) and in one patient it was in caecum (Diverticulum). These were missed in the initial endoscopy and colonoscopy evaluation respectively. Mucosal ulcers followed by erosions and diverticulum were common findings. Total 7 patients had revealed ulcers along the strictures in small bowel. All patients in our series had diagnostic DBE only. In our series, DBE could reveal finding in 30 cases i.e. the diagnostic yield in our series was 60%.

Table 4: Findings and locations

S.N.	Positive Finding	N=30	Location
1	Erosion	5	Jejunum (4), Ileum (1)
2	Ulcer	9	Duodenum (2), Jejunum (5), Ileum (2)
3	Stricture with ulcer	7	Jejunum (4), Ileum (3)
4	Diverticula	5	Jejunum (2), Ileum (2), Caecum (1)
5	Polyp	2	Jejunum (1), Ileum (1)
6	Dieulafoy's lesion	1	Ileum (1)
7	Nodularity	1	Jejunum (1)

Major complications following the DBE were not reported in our series. The most common complication reported was post procedure discomfort which was observed in 28 (more than 50%) of patients and majority of the patients the discomfort related to the procedure disappeared in less than 24 hours. Total 6 patients developed abdominal distension but not requiring any nasogastric tube decompression. However, no patients developed other major complications and there was no procedure related mortality in our series.

DISCUSSION

Double balloon enteroscopy (DBE) has helped us to improve the visualization of entire gastrointestinal tract and for almost a decade now, DBE is being used as a complimentary method to diagnose the small bowel disease.⁴

Small bowel bleeding (SBB) has been one of the most common indications for performing DBE which includes both overt as well as occult SBB. In a study done by Akarsu et al. at a single center from Turkey, SBB was the indication in 26% of cases making it the most common indication.⁵ Some studies have

reported as high as 82.6% of patient with SBB as the main indication for performing the DBE.⁴ Similarly, in a study by Kita et al, SBB was the indication in 49.2% of patients.⁶ Similar to other studies, in our series also, small bowel bleeding was the commonest indication (28%) for performing DBE followed by evaluation of Iron deficiency anemia in 24% of patients which was thought to be due to obscure SBB. The reason behind high percentage of the SBB as the main indication could have been possibly due combined occult and overt bleeding. Most of the iron deficiency anemia patients are suspected to have occult gastrointestinal bleeding. Similar was the case in our series of patients. Similar to other studies, in our series also, chronic pain abdomen, chronic diarrhea and recurrent partial small bowel obstructions were the indication for DBE. The diagnostic yield of DBE is varying from 43- 81% in different series.³ The diagnostic yield of DBE in our series was 60%. DBE is also utilized for therapeutic indications, however all patients in our series were only diagnostic. Capsule endoscopy and DBE both are main methods of evaluating small bowel diseases having similar sensitivities. Most of the recommendations suggest capsule endoscopy as the first method for evaluating the small bowel unless it is contraindicated in situations like patients with partial small bowel obstructions. It has been seen that capsule endoscopy also helps in increasing the sensitivity of DBE.⁷ The capsule endoscopy is not available in our set up. Thus, following upper and lower gastrointestinal endoscopy and imaging, our next tool for evaluating the small bowel disease is DBE. Success rate of complete enteroscopy when required varies between 8- 77.4% in different series.⁶ In our series, total 24 (48%) required combined procedure and the success rate for complete procedure was 26% (13 patients). In remaining patients, completeness was either not required or it was abandoned due to technical difficulties. Angiodysplasia are common findings reported in series from western countries while ulcer, erosions are common in Asian population.⁸ Small bowel GIST is also common finding in many series. In our series, the commonest findings were ulcers 9 and erosions in 5 patients. Vascular malformation was noted only in one patient.

When we analyzed the insertion routes in our series, we observed that majority of our patients 48% (total 24 out of 50) required combined antegrade and retrograde insertion. In a series by Garcia- Correa et al, oral route (69.5%) was the commonest insertion route while combined was required in 21.7% of patients.⁴ In most of the series, oral route has been

most widely utilized as oral route most widely recommended initial approach when there are no clinical findings and supporting investigation suspecting the possibility of disease in distal small bowel.⁹ The combined approach required in majority of our patient could have been most likely due to inability find lesion in the antegrade routes as well as significant number of patients had diagnosis in ileum segment of small bowel.

Diagnostic endoscopic procedures are generally considered safe but not devoid of complications. Therapeutic procedures increase the risk of complications like bleeding and perforations. Most of the complications reported are minor ones and very major complications unusual. Abdominal pain and distension following the procedure is very common findings. Almost 50% of patients in our series complained abdominal discomfort following the procedure but was relieved with regular analgesics. No patients required nasogastric decompression following the procedure. We didn't observe any significant major complications in our series. Some series report abdominal pain in around 20% patients.¹⁰ Following DBE, acute pancreatitis has been reported in around 0.3%.¹⁰ We didn't report any case of pancreatitis in our series.

CONCLUSION

Our series reports DBE as a safe diagnostic procedure for all group of patients with different small bowel diseases and its most common usefulness is in patients with either occult or overt SBB. When performed by trained personals major complications are very infrequent and mostly patients have abdominal discomfort which is self-remitting. These days, most of the tertiary referral centers with advanced endoscopic services have DBE services which definitely improves the quality of endoscopy services being provided by these centers. However, the procedural complexity and long procedure times are still considered as obstacles in incorporating the DBE as routine services. There is limitation of this study. This study is based only on the retrospective analysis of the medical records. Thus, results of this study cannot make any specific recommendations besides highlighting the role of the DBE procedure.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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