



## The Diagnostic Yield of Double Contrast Barium Enema

Ashfaq Chandio<sup>1\*</sup>, Ayub Ali<sup>1</sup>, Ali Javaid<sup>1</sup>, Syed Mustafa<sup>1</sup>, Ruxandra Pietrosanu<sup>2</sup>, Fuad Aftab<sup>1</sup>, Muhammed Ibrahim<sup>1</sup> and Syed Naqvi<sup>1</sup>

<sup>1</sup>Department of General Surgery, Mid-Western Regional Hospital Ennis, Republic of Ireland

<sup>2</sup>Department of Radiology, Mid-Western Regional Hospital Ennis, Republic of Ireland

\*Corresponding author: Ashfaq Chandio, Department of General Surgery, Mid-Western Regional Hospital Ennis, Co. Clare, Republic of Ireland, E-mail: [chandioashfaq@yahoo.com](mailto:chandioashfaq@yahoo.com)

### Abstract

**Introduction:** The disease of colon and rectum impose a major diagnostic challenge to the clinician. Although double contrast barium enema (DCBE) has been overshadowed by the advent of colonoscopy and the sophisticated investigations, its role in failed colonoscopies can not be disputed.

**Aim:** Aim of this study was to evaluate the diagnostic accuracy of DCBE.

**Methods:** Patients attending the Mid-Western Regional Hospital, Ennis for DCBE from January 2003 to December 2007 were identified from computerised database of radiology department and were studied retrospectively. The accuracy / effectiveness of the procedure were examined in terms of its completeness. The diagnostic yield for benign and malignant pathologies was determined along with primary and secondary diagnosis.

**Results:** A total of 278 patients (159 Females and 119 Males) with mean age of 64.44 +/- 12.99 (range 25-92) attended the Hospital for DCBE. Colonic cancer were diagnosed in 15 (5.39 %) whereas diverticular disease was reported in 137 (49.28 %) patients. There were no missed pathologies and a failure rate of less than 2% was achieved in this study.

**Conclusion:** Double contrast barium enema is a sensitive diagnostic tool in the investigation of colorectal pathologies. In view of its low failure rate, it may be used as an adjunct to commonly practiced endoscopic investigation to further increase the accuracy of diagnosis.

### Introduction

Management of a cancer becomes more complex, it becomes impossible for any individual clinician to have the intellectual and technical competence that is necessary to manage all the patients presenting with a tumour, colorectal cancer is a major health problem; it is the second common cause of death in the United Kingdom. Colorectal cancer screening poses challenge to clinician than for other conditions largely due to several modalities that are available to provide as screening tool, Sigmoidoscopy, Faecal occult blood test, Colonoscopy, CT Colonography, and Double contrast barium enema [1,2]. Prognosis after treatment is much better in early stage of the disease Moreton and his associates developed

technique of double contrast barium enema [3]. Effective way to evaluate the large bowel; it is useful investigating tool in patients with colorectal symptoms. It has role assigned in screening for colorectal carcinoma in the US guidelines for colorectal cancer screening [4,5]. Its advantage compared to colonoscopy are it is safer [6], painless, less expensive, does not require sedation, providing total 'Plan' view of the colon with permanent pictures. With the advent of sophisticated investigations and widespread use of colonoscopy the role of barium enema has been questioned [7,8].

### Aim

Aim of this study is to evaluate the result of Double Contrast Barium Enema as diagnostic tool.

### Methods

This is retrospective review on patient underwent double contrast barium enema at Mid-Western Regional Hospital, Ennis, Co. Clare, Republic of Ireland from January 2003 to December 2007 on account of symptoms related to large bowel, failed Colonoscopy Data were collected from Radiology department. Following information were retrieved age, gender, indications for investigations and radiological findings.

The effectiveness/accuracy of the procedure in relation to its completeness. The diagnostic yield of pathologies (Benign/Malignant) was determined along with primary and secondary diagnosis.

### Results

During this four year period a total 278 patients attended for

Table 1: Barium enema findings.

Findings	Incidence	Percentage
Diverticular disease	137	49.28
Normal examination	92	33.09%
Stricture	19	6.83%
Malignancy	15	5.39%
Colitis	5	1.79%
Polyps	5	1.79%
Failed	4	1.43%
Fistula	1	0.35%

**Citation:** Chandio A, Ali A, Javaid A, Mustafa S, Pietrosanu R, et al. (2014) The Diagnostic Yield of Double Contrast Barium Enema. Int J Surg Res Pract 1:010

**Received:** August 21, 2014; **Accepted:** November 06, 2014; **Published:** November 10, 2014

**Copyright:** © 2014 Chandio A. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Table 2:** Clinical presentation.

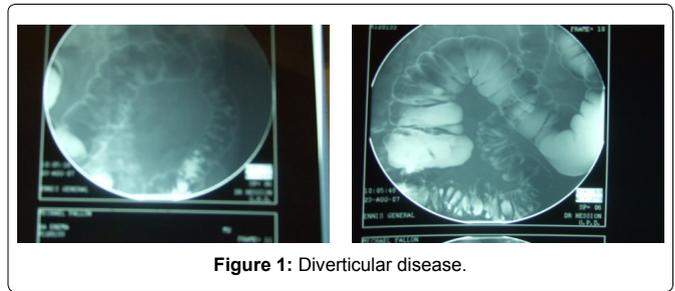
Symptoms	No. of patients	Percentage
Bleeding/Rectum	95	34.17%
Constipation	70	25.17%
Abd. Pain/discomfort	57	20.50%
Change in bowel habit	43	15.46%
Abdominal lump	13	4.67%

double contrast barium enema of which 159 Females and 119 Males with mean age of 64.44 +/- 12.99 (range 25-92). Majority of the investigations, 137 (49.28%) were diverticular disease, Normal examination 92 (33.09%) was reported followed by Non specific narrowing 19 (6.83 %), Colonic cancer were diagnosed in 15 (5.39%), Colitis 5 (1.79%), Polyps 5 (1.79%), Fistula 1(0.35%) patients. There were no missed pathologies and a failure rate of less than 2% (Table 1). Failed Colonoscopy was most common indication for DCBE. Rectal bleeding was the most frequent symptoms, abdominal pain/discomfort, change in bowel habit, constipation and abdominal lump were the next frequent symptoms prompting barium enema (Table 2).

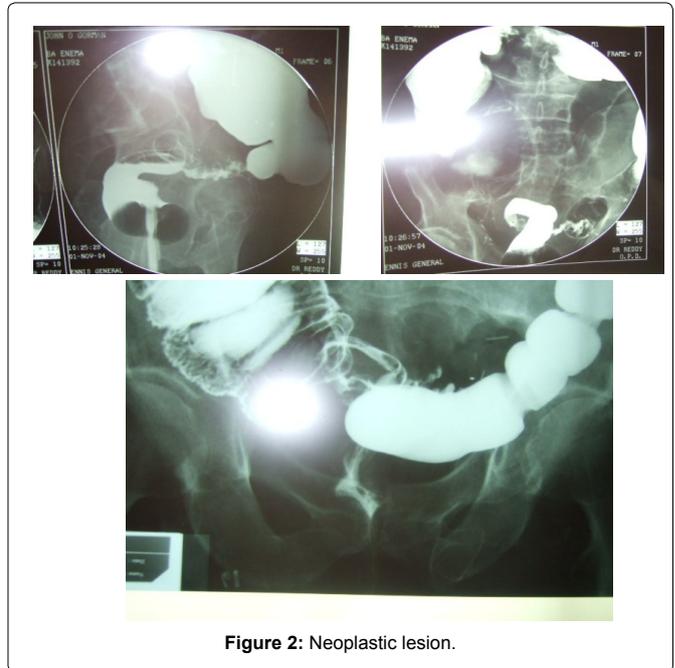
### Discussion

Conventional radiography continue to play a central role in the diagnostic pathway, To investigate patients with symptoms suggestive of colorectal cancer several procedures are available, barium enema is established method despite concerns about its sensitivity [9]. Double contrast barium enema is used as radiologic alternative to Colonoscopy for Colorectal symptoms allows evaluation of the entire colon in approximately 90% -95% of the patients [10]. The examination provides total 'Plan' view of the colon with permanent pictures accessible to different radiologists and available for comparison without bringing patient back<sup>11</sup>. It has ability to precisely localize and determine the extent of colonic lesions and is feasible diagnostic tool, easily executed with a high rate of complete examination [11]. Department of health UK shows in 2011 in England 70,000 Barium enema examinations were under taken [12].

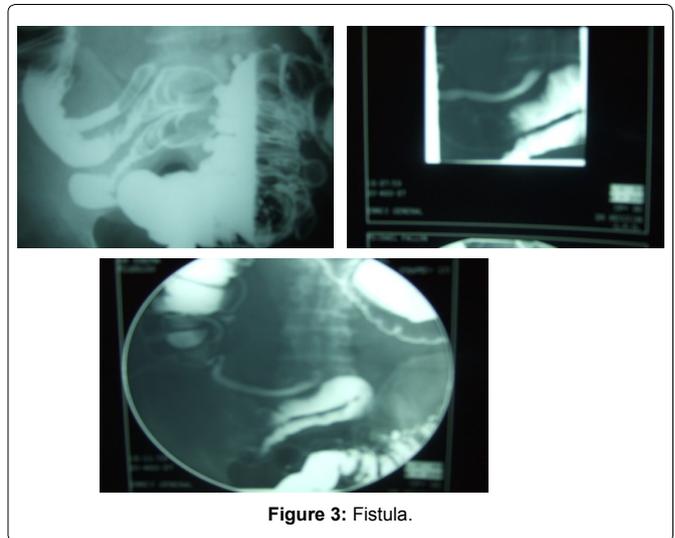
It has role assigned in screening for colorectal cancer. Organization including World Health Organization (WHO), American Cancer Society (ACS), US Agency for Health Care Policy and Research (USAHCPR), and the US Preventive Service Task Force (USPSTF) has endorsed guidelines for colorectal cancer screening [13]. Virtual Colonoscopy also known as Computed tomography colonography (CTC) introduced in 1994 as non-invasive method of imaging colon using helical CT [14] it has not yet been endorsed as screening test for carcinoma of colon. Double contrast barium enema is rated high in terms of the convenience, safety, acceptance by patients, cost effective [15] its advantage as compared to Colonoscopy are safer, painless, less expensive does not require sedation providing total plan view of the colon with permanent pictures where as colonoscopy allows detailed mucosal examination of particular sites with biopsy proof. Colonoscopy is also limited by technical difficulty at strictures and diverticular disease whereas enema rarely fails to demonstrate these difficult segments. In our institution we performed DCBE in failed colonoscopy patients and in our study we found high number of investigations to be diverticular disease 137 (49.28%) (Figure 1). Portraying high sensitivity of barium enema in diagnosing this disease. Large number of DCBE was normal examination 92 (33.09%). Normal examination could also be due to barium enema does not fare too well as the sole screening test it does not examine the distal rectum and anus thus making Digital rectal examination and Proctoscopy mandatory in such situations [15]. The non specific narrowing seen in 19 (6.83%) could be due to malignant infiltration of bowel, inflammatory bowel disease. It may also be feature of the diverticular disease. The Neoplastic lesions were the fourth commonest findings accounting 15 (5.39%). The yield for Polyp was low 5 (1.79%) This situation is worrying if premalignant lesions are to be diagnosed and treated early to prevent malignant transformation. The sensitivity of the barium enema in detection of polyps is related to polyp size [16]. This investigative tool is therefore not adequate for screening



**Figure 1:** Diverticular disease.



**Figure 2:** Neoplastic lesion.



**Figure 3:** Fistula.

for pre malignant colorectal lesions and has to be complemented with endoscopy [11]. Colitis being sixth commonest finding with prevalence 5 (1.79%) Rare finding of appendicoileal fistula 1 (0.35%) was also found. There were no missed pathologies and a failure rate of less than 2%. Efficacy of barium enema is dependent on the skill of the radiologist in the reading the subtleties of the resultant images, patients preparation and cooperation during the procedure. In average risk and high risk individual double contrast barium enema has also been approved as reimbursable option for screening colorectal cancer [17]. Morbidity and Mortality from colorectal cancer can greatly reduce by effective routine implementation of screening.

### Conclusion

Double contrast barium enema is an important and sensitive

diagnostic tool in evaluation of patient with colorectal symptoms. It has high yield in diagnosis of colorectal conditions. In view of its low failure rate, it may be used as an adjunct to endoscopic investigations to increase diagnostic accuracy.

## References

1. Winawer SJ, Fletcher RH, Miller L, Godlee F, Stolar MH, et al. (1997) Colorectal cancer screening: clinical guidelines and rationale. *Gastroenterology* 112: 594-642.
2. United States Preventive Services Task Force (1996) Di Guiseppi C, Atkins D, Woolf H, eds. *Guide to clinical preventive services (2nd ed)* Baltimore : Williams & Wilkins.
3. MORETON RD, STEVENSON CA, YATES CW (1949) Fictitious polyps as seen in double-contrast studies of the colon. *Radiology* 53: 386-393.
4. US. Preventive Services Task Force. (2002) Screening for colorectal cancer: recommendation and rationale. *Ann Intern Med* 137: 129-131.
5. American Cancer Society (2003) American Cancer Society guidelines for early detection of cancer. *Cancer Clin* 53: 27.
6. Blakeborough A, Sheridan MB, Chapman AH (1997) Complications of barium enema examinations: a survey of UK Consultant Radiologists 1992 to 1994. *Clin Radiol* 52: 142-148.
7. Fletcher RH (2000) The end of barium enemas? *N Engl J Med* 342: 1823-1824.
8. Winawer SJ, Stewart ET, Zauber AG, Bond JH, Ansel H, et al. (2000) A comparison of colonoscopy and double-contrast barium enema for surveillance after polypectomy. National Polyp Study Work Group. *N Engl J Med* 342: 1766-1772.
9. Sharif MK, Sheikh K, Carroll NR, Whitley S, Greenberg D, et al. (2011) Colorectal cancer detection: time to abandon barium enema? *Frontline Gastroenterol* 2: 105-109.
10. Bloomfield JA (1981) Reliability of barium enema in detecting colonic neoplasia. *Med J Aust* 1: 631-633.
11. Bellomi M, Spagnoli I, Zucchi F (1991) Digestive System and Biliary Tract. In: Damascelli B. (Editor) *Basic Concepts in Diagnostic Imaging*. Raven Press: 29-50.
12. Department of Health Diagnostics waiting times and activity information. [<http://transparency.dh.gov.uk/2012/07/05/diagnostics>]
13. Smith RA, Cokkinides V, Eyre HJ; American Cancer Society (2003) American Cancer Society guidelines for the early detection of cancer, 2003. *CA Cancer J Clin* 53: 27-43.
14. Vining DJ, Gelfand DW (1994) Non invasive colonoscopy using helical CT scanning, 3D reconstruction, and virtual reality. Presented at the 23rd Annual Meeting and Postgraduate course of the Society of Gastrointestinal Radiologist, Maui, Hawaii.
15. Fletcher RH (2000) The end of barium enemas? *N Engl J Med* 342: 1823-1824.
16. Sosna J, Sella T, Sy O, Lavin PT, Eliahou R, et al. (2008) Critical analysis of the performance of double-contrast barium enema for detecting colorectal polyps > or = 6 mm in the era of CT colonography. *AJR Am J Roentgenol* 190: 374-385.
17. (1997) Colorectal cancer screening tests: conditions for and limitations on average. 62 *Federal Register* 59100 – 59101.