

Frequency of Diagnosis of Colorectal Cancer with Double Contrast Barium Enema

Najeeb S Jamsheer, MD, FRCR*

Neelam. Malik, MD, MNAMS**

Objective: To determine the frequency of reporting a malignant lesion by double contrast barium enema (DCBE) examination.

Design: Retrospective analysis.

Setting and Subjects: Consecutive eight hundred and thirty seven adult patients who had DCBE in the year 1999 were included in this analysis.

Results: Colorectal malignancy was diagnosed in seventeen patients (2.0%). Six hundred ninety (82.4%) examinations were normal.

Conclusion: Very low yield of colorectal cancer in a non-screening setting by an imaging study (Barium enema) that delivers high dose of radiation to the patient. Our recommendation is to revise the indication for this examination.

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Double contrast barium enema (DCBE) is safe, accurate and cost effective method of diagnosing premalignant and malignant lesions of the large bowel. For this reason, a large number of patients over the age of 40 years with history or clinical findings suggestive of large bowel disease undergo barium enema examination to rule out colorectal malignancy. The procedure is quite safe with very few complications¹ but it delivers a large dose of radiation to the patient².

We perform a large number of DCBE examinations every year. This retrospective study was undertaken to find out how frequently we report a malignant lesion by this investigation in our institution.

METHODS

Eight hundred and thirty seven patients who had DCBE in the year 1999 served as the study group. Only those patients who were above the age of 30 years were included. The case files and barium enema reports of these patients were retrospectively analysed with regard to age group, sex, nationality, presenting symptoms, findings on physical examination, laboratory investigations and results of biopsy or surgery. These patients were referred for barium enema examination for a variety of reasons including persistent GI symptoms, screening after polypectomy or colon resection (Table 1). In most patients,

* Consultant & Chairman

** Consultant

Department of Radiology
Salmaniya Medical Complex
Kingdom of Bahrain

non-bleeding GI symptoms were described as “persistent” but the actual duration of symptoms was not recorded. No patient had DCBE for screening purpose.

Table 1. Indications for Barium Enema

| | No | % |
|---|-----|------|
| 1. Altered bowel habits with constipation | 532 | 63.5 |
| 2. Nonspecific abdominal pain | 242 | 29.0 |
| 3. Bleeding per rectum | 49 | 4.8 |
| 4. Follow up after polypectomy and colon cancer | 14 | 1.6 |
| TOTAL | 837 | 100 |

A standard DCBE was performed and interpreted by radiologists with formal training in the performance of gastrointestinal studies. All patients who had suspicious lesions on barium enema examination were referred for colonoscopy and biopsy.

RESULTS

Eight hundred and thirty seven (837) adult patients had barium enema examination during the year 1999, 734 (87.7%) were Bahraini and 103 (12.3%) non-Bahraini. The non-Bahrainis represented a heterogenous group of people coming mostly from South-East Asia and other middle-Eastern countries. Six hundred and twenty two (622) (74.3%) patients were referred for barium enema from the outpatient clinics and 215 (25.7%) were inpatients. There were 434 males and 403 female patients. The age ranged from 32 to 78 years. A breakdown by age and sex is given in Table 2. It is noteworthy that almost two thirds of the patients (558) were between 40 and 69 years of age.

Table 2. Barium Enema Sex and Age Distributions

Altered bowel habits with constipation was the commonest indication for requesting barium enema in 532 patients (63.5%), followed by nonspecific abdominal pain in 242 (29%). Forty nine (5.8%) patients had history of bleeding per rectum; 14 (1.6%) patients were referred as follow up after polypectomy or colon cancer.

We found 21 patients (2.5%) with colorectal neoplasia; of these 17 (2.0%) with invasive malignancies and four (0.5%) with adenomas. Among the 17 patients with invasive malignancies, 12 were males and 5 females. The youngest patient was 39 years old male. The majority (12 patients) were over the age of 50 years. There were 9 cases of rectal carcinoma, 3 of rectosigmoid and 5 cases of colonic carcinoma.

Table 3. Diagnostic outcome for different GI symptoms

| | Malignancy | Polyp | Diverticular Disease | IBD * | Normal | Total |
|--|------------|-------|----------------------|-------|--------|-------|
| Rectal Bleeding | 9 | 2 | 8 | 5 | 25 | 49 |
| Altered bowel habits with constipation | 6 | - | 58 | - | 468 | 532 |
| Nonspecific abdominal pain | 2 | 2 | 38 | 4 | 196 | 242 |
| Following polypectomy and colon cancer | - | - | - | - | 14 | 14 |

*IBD – *Inflammatory Bowel Disease*

Table 3 shows the diagnostic outcome for different GI symptoms. Out of 49 patients who presented with bleeding per rectum, 9 (18%) were found to have colorectal malignancy and 2 colonic polyps. Seven hundred and seventy four (774) patients had barium enema for non-bleeding bowel symptoms. In this group, we found only 8 cases (1.03%) of large bowel malignancies; 6 of them had history of altered bowel habits with constipation and 2 presented with non-specific abdominal pain. Significantly 242 patients were referred for barium enema examination for non-specific abdominal pain. The incidence of malignancy in the whole group was only 0.4%.

Six hundred and ninety (690) (82.4%) barium enema examinations were normal; 96 patients had diverticular disease of the colon, and 9 patients were found to have inflammatory bowel disease. In another 21 cases, suspicious lesions of varying possibility for colonic cancer were reported but subsequently ruled out by colonoscopy.

DISCUSSION

It is a common clinical practice to investigate the large bowel in adult patients with bowel symptoms to rule out colorectal malignancy which is one of the leading causes of cancer-related mortality and morbidity worldwide³. The life-time risk of developing this cancer is 2.5 to 5% in the general population but two to three times higher in persons who have a positive family history or an adenomatous polyp in the colon. Evidence exists that a reduction in mortality from colorectal cancer is feasible through early detection and treatment. Several approaches are available for the detection of colorectal neoplasia. Double contrast barium enema (DCBE) and colonoscopy are recognized as comparable and complimentary for the diagnosis of colorectal cancer. Despite the fact that the use of colonoscopy has increased in the last two decades, the role of DCBE is still important in view of its greater safety, cost effectiveness, better patient tolerance and

comparable high sensitivity⁴. Its overall sensitivity is greater than 90% for the detection of colonic lesions larger than 1cm in size and the complications are very few. The procedure has a perforation rate of one in 10,000 and the mortality rate is one in 50,000⁵. This radiological procedure, however, delivers a very large dose of radiation to the patient, 300 – 500 mrad of radiation (equivalent to 450 chest x-rays) is delivered to the patient during barium enema examination.

Indications for barium enema include altered bowel habits, abdominal pain, intestinal obstruction, rectal bleeding, anaemia and history of previous neoplasia. The yield of DCBE in patients over 40 years of age with different bowel symptoms has been extensively investigated. The prevalence rate of colorectal neoplasm among patients with rectal bleeding is generally high⁶. Brenna et al⁷ found colorectal malignancy in 12% and adenomatous polyps in 18% of patients referred because of overt rectal bleeding or faecal occult blood with or without other GI symptoms. There is, however, less agreement in the literature about performing gastrointestinal studies in patients who present with non-bleeding GI symptoms such as constipation or persistent abdominal pain. Kalra et al⁸ reported a rate for colorectal disease including cancer, polyps, colitis and diverticular disease of 16.7% (9 of 54) in patients referred for barium enema because of constipation and 0% (0 of 201) in-patients who had barium enema due to nonspecific abdominal pain in the absence of GI bleeding.

Brenna et al⁷ showed that patients referred because of non-bleeding GI symptoms had an average benefit score of less than half that of patients referred because of bleeding; only one of 117 patients (0.9%) referred because of non-bleeding GI symptoms had malignancy. In our study, 9 out of 49 patients (18%) who had history of bleeding per rectum were found to have colorectal malignancy; while 774 patients who had barium enema due to non bleeding bowel symptoms, only 8 (1.03%) had large bowel malignancy.

The incidence of colorectal cancer is relatively low in the young adult population, only 3 per 100,000 in the 30-50years old age group⁹. The incidence rises progressively thereafter. In our study, one patient with colonic malignancy was 39 years old. The majority (12/17) were over the age of 50 years. 252 patients (30%) referred for barium enema in the year 1999 were less than 40 years of age; in this age group only one patient (0.03%) had colorectal malignancy.

Significantly, 82.4% examinations were normal. It should be noted that the population source for this study was a selected group of adult patients with bowel symptoms. Although in no patient DCBE was performed as a screening test still the yield of colorectal neoplasia was very low (2.0%). This low yield is acceptable for a screening but not for a clinical test, We therefore, recommend adherence to the strict criteria^{10,11} in requesting DCBE.

CONCLUSION

This study demonstrates the need for barium enema examination in patients with persistent rectal bleeding. The yield of this investigation in patients younger than 50 years of age with non-bleeding GI symptoms was very low necessitating review of referral criteria for DCBE at our institution.

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