

# Barium Enema in patients older than 75: experience from a district general hospital targeting symptomatic patients

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## Abstract

**Introduction:** The prevalence of colorectal cancer increases with age. Barium enema is an option for the assessment of colonic disorders. However, it may offer less diagnostic yield and is less advantageous than formal colonoscopy. Colonoscopy is still considered to be the gold standard in terms of access to immediate interventions like biopsy and polypectomy. We have previously described our experience of colonoscopy in symptomatic older patients, drawing a conclusion that it appears to be a reasonably safe procedure when performed by appropriately trained personnel, and provides a high diagnostic yield when employed in targeted patient groups.<sup>1</sup>

**Aims:** In this study, we sought to ascertain the indications for and describe the outcomes of barium enema in a comparative cohort of older patients referred to a district general hospital (DGH), using the same study period as in the previously described colonoscopy study.<sup>1</sup>

**Methods:** A retrospective review evaluating the use of barium enema in a small DGH in England by auditing the records of 163 patients aged 75 years and above, that had this procedure during the period June 1996 - December 2002.

**Results:** The mean age was 80.3 (range 75–95) years, with women representing 66.3% (n = 108). The commonest indications for barium enema were abdominal pain – 75 (46.0%), change in bowel habits – 61 (37.4 %), rectal bleeding – 43 (26.4%), loose stools – 21 (12.9%), and weight loss – 18 (11.0%). An uncorrected rate of 71.8% could be ascertained for satisfactory completion of barium enema studies. The commonest reasons for incomplete studies were inability to retain the barium enema, poor mobility and poor bowel preparation.

No major complications were noted due to the procedure in this series. There were 6 suspected cases of neoplasia, representing 3.7% of the entire cohort. Five of the 6 underwent major resection surgery and had histologically confirmed adenocarcinomas.

**Conclusions:** Barium enema has a good safety profile and can yield significant colonic findings, particularly in the symptomatic older patient aged >75 years. Cancer detection rates in our cohort were predominantly right sided colonic lesions. However, given that the general population based anatomical occurrence of colorectal cancer is predominantly left sided, there remains the possibility of missing sigmoid and rectal lesions, especially if barium enemas are not performed in combination with flexible sigmoidoscopy to assess the sigmoid and rectum. Colonoscopy would still appear to be the investigation of choice for symptomatic patients, particularly when neoplasia is suspected.

## INTRODUCTION

It is recognised that the prevalence of colorectal cancer increases with age. Barium enema remains an option for the assessment of colonic disorders. However, it is less advantageous than formal colonoscopy, in terms of absence of immediate diagnostic and therapeutic interventions like biopsy and polypectomy which can be performed as far as the right colon and caecum, when using colonoscopy. Polyps

less than 10mm are less likely to be satisfactorily demonstrated on barium enema, though larger polyps and cancers may be detected. However, evidence exists to suggest that combined double contrast barium enema and flexible sigmoidoscopy can approximate to the diagnostic yield of colonoscopy.<sup>2,3,4</sup> Colonoscopy further avoids the radiation exposure required for barium enema studies.

We have previously described our experience of colonoscopy in symptomatic older patients, drawing a conclusion that it appears to be a reasonably safe procedure when performed by appropriately trained personnel, and providing a high diagnostic yield when employed in targeted patient groups.<sup>1</sup>

The aims of this study were to review the demographic data and indications for barium enema in the patients referred to our service. We further sought to describe the procedural difficulties encountered, outcomes of the investigation and the types of subsequent major procedures undertaken for suspected cancers.

## METHODS

We retrospectively evaluated the use of barium enema in a small district general hospital in England by auditing the records of 163 patients aged 75 years and above, that had this investigation from June 1996 - December 2002. Approval was obtained from the local audit unit.

To facilitate comparison of findings and results, we used the same study period as in the previously described colonoscopy study.<sup>1</sup> In the latter, we described the indications for, the procedural difficulties encountered, outcomes of colonoscopy and types of subsequent major procedures undertaken in 159 symptomatic patients aged 75 years and above.<sup>1</sup>

At the time that this study was conducted, the local service did not have a formal routine colon cancer screening programme in place. Consequently, most of our patients were referred for assessment on account of symptoms/signs, or for surveillance following polypectomies or cancer resection surgery.

In our centre, local guidelines recommended a minimum one-day bowel preparation with oral sodium picosulphate; with patients allowed liberal and clear fluids orally on the day before the study. Barium enemas were performed by personnel with appropriate training in our radiology department. Antispasmodics (usually hyoscine butylbromide), short acting analgesics (usually pethidine) and occasionally a mild anxiolytic were used as required, and based on the needs of the patient and the discretion of the radiologist. Medical/surgical case records, radiological reports and histopathology reports were reviewed and a proforma was designed to standardise data collection.

## RESULTS

The mean age was 80.3 (range 75–95) years with women representing 66.3% (n = 108). The commonest indications for barium enema were abdominal pain – 75 (46.0%), change in bowel habits – 61 (37.4 %), rectal bleeding – 43 (26.4%), loose stools – 21 (12.9%), and weight loss – 18 (11.0%). Others noted indications were: 13 cases for surveillance following previous polypectomy and cancer resection surgery, 9 cases with abnormal physical signs (e.g. distension, iliac fossa mass), 9 cases with abnormal physical symptoms (e.g. anorexia, flatulence, faecal incontinence, investigation of possible colovesical fistula, tenesmus), and one case of imaging confirmed liver metastases but with an unknown primary site. Some patients had multiple indications.

An uncorrected rate of 71.8% could be ascertained for 'satisfactory' completion of barium studies (caecum visualised and/or reflux of barium via ileocaecal valve). The stated completion rate does not correct for cases with poor bowel preparation, strictures et cetera. The commonest reasons for unsatisfactory and/or incomplete studies were inability to retain the barium enema – 20 (12.3%), poor mobility – 15 (9.2%) and poor bowel preparation – 5 (3.1%). Other documented problems were technical difficulties causing parts of the colon to be poorly visualised due to redundant and tortuous sigmoid loops 3 (1.8%), discomfort – 2 (1.2%), and an uncooperative patient due to cognitive impairment.

No major complications were noted, nor were there any deaths due to the procedure in this series.

The barium enema findings are shown in Table 1.

Figure 1

Table 1: Barium Enema Findings

|                                  |             |
|----------------------------------|-------------|
| Diverticulosis                   | 107 (65.6%) |
| Polyps                           | 7 (4.3%)    |
| Suspected colorectal cancer mass | 6 (3.7%)    |
| Stricture                        | 6 (3.7%)    |
| Colitis                          | 4 (2.5%)    |
| Procedure could not be done      | 5 (3.1%)    |
| Normal study                     | 37 (22.7%)  |

Thirty seven barium enema studies were reported as normal. Some examinations demonstrated more than one abnormality. It is noteworthy that barium enemas also identified some other treatable conditions such colitis and strictures that could account for symptoms. Some patients with incomplete or unsatisfactory barium enema results were subsequently investigated by other modalities like computerised tomography (CT) scans or colonoscopy.

From the barium studies, there were 6 suspected cases of colorectal cancer, representing 3.7% of the entire study group of 163. Five of the 6 underwent major resection surgery and were subsequently shown to have histologically confirmed adenocarcinomas. The 5 procedures undertaken were: right hemicolectomy (n = 4), total colectomy and ileostomy (n = 1). One case showed evidence of advanced metastatic disease and surgery was deemed inappropriate.

DISCUSSION

This study noted that older patients in the ≥ 75 years age group, being evaluated for significant lower gastrointestinal disease (with relevant symptoms or signs) could safely undergo barium enema, and with a reasonable diagnostic yield.

The colorectal cancer pickup rate in this study was 6 out of 163 barium enemas, representing 3.7% of the cohort. The comparative figure of colorectal cancer pickup rate was 18 out of 159 patients, representing 11.3% of the earlier

reported colonoscopy cohort.<sup>1</sup>

To facilitate comparison, both cohorts represent investigations performed in the same institution, over the same time periods, and on individuals referred from the same broad geographical area. Both studies reviewed indications for, findings and outcomes of investigations in individuals of ≥ 75years of age.

It is noteworthy that the 5 major cancer resection surgeries performed in this barium enema study cohort were targeted at right colonic cancers. This correlates with suggestions that barium enema is reasonably good at identifying right colonic lesions when a complete study is achieved.

It has been reported that up two-thirds of colorectal cancers occur in the left side of the colon, the sigmoid and rectum. However, difficulties interpreting barium enema studies have been reported; usually relating to small and non-visualised lesions obscured on account of redundant and tortuous sigmoidal colon loops, small lesions in the rectum, poor bowel preparation etc. Barium enemas are also known to have both false positive and false negative rates which are not negligible.<sup>2</sup>

No left sided colorectal cancers were identified in this study. This could imply they were not present or that the barium study in isolation was not sufficient to identify these. The potential for the latter to occur would support the viewpoint that using barium enema as a sole investigation for colorectal cancer could be inadequate to identify a significant number of left sided and rectosigmoidal cancers. This is especially worth noting given the recognition that the general population based anatomical occurrence of colorectal cancer is that of it being a predominantly left-sided condition.

However, in this study we did not set out to review whether or not the patients undergoing barium enemas also had a flexible sigmoidoscopy as part of their diagnostic workup. It is therefore possible that the final cancer pick-up rate might be expected to be greater (in those undergoing flexible sigmoidoscopy + double contrast barium enema) compared to the above quoted figure (which represents barium enema only).<sup>3,6,7,8</sup> Other limitations of this study are that it is retrospective, and that the numbers reviewed, though comparable, are fairly modest. The findings of this study are further limited by the fact that we did not assess other parameters like post-operative longevity or quality of life issues.

Difficulties identified in obtaining complete and satisfactory barium enema results were often combinations of preparatory, technical, physical and anatomic difficulties, as well as occasional cases of inadequate documentation.

## CONCLUSION

It is acknowledged that older patients differ significantly with regards to pre-morbid health status and their tolerability for, and fitness for invasive procedures such as barium enemas and colonoscopy.

Barium enema is often considered as a follow up investigation to a flexible sigmoidoscopy, or to an incomplete colonoscopy attempt, and this may be a reasonable option to evaluate the right colon.

However, barium enema is occasionally taken to be an alternative investigative modality to colonoscopy, particularly where it is felt that the latter may not be tolerated by the older patient. This practice is however subject to challenge as multiple studies continue to suggest that many older patients can indeed safely undergo colonoscopy.<sup>1, 9\*10\*11\*12\*13\*14\*15\*16\*17\*18\*19\*20</sup> Furthermore, barium enema (performed in isolation) does not appear to have the same level of diagnostic yield as formal colonoscopy in the investigation of lower gastrointestinal disorders. Our study does support the safety profile of barium enema and that it can provide a reasonable diagnostic yield when performed by appropriately trained personnel, and in targeted (in this study, symptomatic) patient groups. Nevertheless, colonoscopy would still appear to be the investigation of choice for symptomatic patients, particularly when neoplasia is suspected.<sup>1,14\*20</sup>

Where fitness for formal colonoscopy is deemed lacking, consideration could be given to alternative investigations like flexible sigmoidoscopy and barium enema, or computerised tomography (CT) colography / virtual colonoscopy.

Possibly with time, we may see the formal introduction of single-use, dual-end video capsule colonoscopy; with the anticipated development of devices having long battery lives that can cater for long colonic transit times. We look forward to the advent of what may yet prove to be a revolutionary addition to the armamentarium with which we can manage more appropriately and effectively, our frailer older patients who present with symptoms and signs that suggest colonic disease.

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