

## PAPERS AND ORIGINALS

## Upper gastrointestinal endoscopy: its effects on patient management

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*British Medical Journal*, 1979, 1, 775-777**Summary and conclusions**

Out of 95 patients referred for upper gastrointestinal endoscopy after a barium-meal examination, 44 underwent a change in management. Some changes were minor but in 12 patients a decision on surgery was required. Seven of these patients were among a group of 13 for whom the referring consultant would have recommended laparotomy had endoscopy not been available, while the other five were subjected to an unplanned laparotomy.

These findings support the practice of performing endoscopy on patients whose symptoms are not fully explained by barium-meal examination, especially patients aged over 45. In such cases the procedure also seems to be cost-effective.

**Introduction**

Fibreoptic endoscopy is now widely used to investigate suspected upper gastrointestinal tract disease. In our four districts some 2500 examinations are done yearly, which represents a considerable load; thus an examination of the usefulness or other-

wise of the technique seemed long overdue. Its value in acute upper gastrointestinal haemorrhage has been assessed<sup>1 2</sup> but it has not been evaluated objectively in other conditions. Thus to determine the real rather than imagined value of endoscopy we have studied prospectively a consecutive series of patients referred for the procedure after having undergone a barium-meal examination.

**Method**

Of the four clinicians participating in this study, two work in district general hospitals and two in nearby undergraduate teaching hospitals. All accept patients for outpatient assessment from general practitioners, and also direct referrals for endoscopy from consultant colleagues. The patients studied represent a population usually seen for outpatient endoscopy—that is, patients presenting with upper gastrointestinal symptoms and referred for endoscopy within three months after a normal barium-meal examination or one showing abnormalities that need to be elucidated. The doctor referring the patient for endoscopy (in the case of some outpatients this was the endoscopist himself) was asked, "What immediate action would you take if fibre endoscopy was not available?" He was allowed only one option in a check list (see table, first column). Endoscopy was carried out, the result recorded, and, one to three months later, the case records examined to determine the immediate course of clinical management adopted by the referring clinician. The post-endoscopy plan was then compared with the pre-endoscopy plan to determine any change.

**Results**

Of the 95 patients studied, 65 presented with dyspepsia or abdominal pain as the main symptom. Vomiting (16 cases) and weight loss (11) were the commonest secondary symptoms and were occasionally given as the main symptom. The patients were aged 19-79 years and had a mean age of 54; 54 were men.

*Overall changes in treatment plan*—In almost half the patients (table) the pre-endoscopy plan was symptomatic treatment with later review of the clinical response. In this group endoscopy resulted in no major change in management, apart from three patients who were given specific healing agents for gastric ulcer. Out of 13 patients for whom laparotomy was planned before endoscopy, however, only six

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## Immediate management, as planned before endoscopy and after receipt of endoscopy findings

Pre-endoscopy plan	No of patients	Post-endoscopy plan					
		No change	Laparotomy	Carbenoxolone etc	Further investigation	Symptomatic treatment	Refer to general practitioner
Specific treatment:							
Laparotomy	13	6		5*		2*	
Carbenoxolone or deglycyrrhizinated liquorice and repeat barium meal	10	4	1*			5	
Investigations:							
Rigid endoscopy examination under general anaesthetic	6	1	2*		3		
Repeat barium meal	15	1	2*	1	2	8	1
Other	6	4				2	
Other management:							
Treat symptomatically and review clinical response later	40	32		3	2		3
Refer back to general practitioner	4	3			1		
Other management	1					1	
Total	95	51	5	9	8	18	4

\*Change to or from laparotomy.

went on to have the operation. Another five were given specific medication for ulcer and two treated symptomatically. Conversely, five patients for whom immediate laparotomy had not been planned underwent operation as a result of the endoscopic findings. Thus there was an apparent change of plan as a result of endoscopy in 44 of the 95 cases; in 12 it entailed a change to or from laparotomy and in 32 less dramatic changes, which are not discussed further.

*Changes from laparotomy*—The seven patients apparently "spared" laparotomy included two men whose radiologically suspected carcinomas proved to be benign ulcers on endoscopy, and another with suspected carcinoma whose appearances on endoscopy were normal. The radiological diagnosis of gastric ulcer in a further patient was not confirmed. Those in two other patients were confirmed but treatment was changed, presumably as a result of the additional confidence in their benign nature provided by endoscopy and biopsy. The seventh patient was given symptomatic treatment when the disordered fundal pattern shown by barium meal proved on endoscopy to be due to atrophic mucosa.

*Changes to laparotomy*—In five cases the outcome of endoscopy was previously unplanned surgery. In two of these oesophageal cancers were seen on endoscopy, one having already been suspected radiologically; the other, associated with oesophageal stricture (which was also seen radiologically), had previously been regarded as associated with a hiatus hernia. Both these patients, however, in the absence of flexible fiberoptic endoscopy, would have been examined with a rigid endoscope and undoubtedly subjected to operation eventually. Two patients would have had a repeat barium meal (had flexible endoscopy not been available) to try to confirm their suspected gastric carcinoma: these were confirmed, in one by biopsy and in the other by the gross appearance. A further patient with dyspepsia, vomiting, weight loss, and anaemia had no radiological abnormality at all, but gastroscopy showed both a pyloric ulcer and a small gastric ulcer just distal to the angularis. The radiographs of this patient on review indicated true failure of radiology, as the films were of adequate quality. Clearly four of these five patients would have come to surgery ultimately even without fibre endoscopy; for the last patient this is less certain.

*Duodenal ulcer*—When this study was carried out no specific treatment for duodenal ulcer was available. Nine patients, however, showed a duodenal ulcer on endoscopy and were treated symptomatically. Now they might well be treated instead with cimetidine, but in only three of these patients would this represent a change from the pre-endoscopy plan. The remaining six had some duodenal abnormality in the barium-meal film, and for many clinicians this evidence alone, together with duodenal ulcer symptoms, would warrant treatment with cimetidine.

## Discussion

The value of any investigative technique in clinical medicine must ultimately be determined by whether its use leads to any important change in treatment or clinical outcome. Dronfield *et al*<sup>2</sup> failed to show any effect of emergency upper gastrointestinal endoscopy on the survival of patients admitted with upper gastrointestinal bleeding. The other main indication for

upper gastrointestinal endoscopy is the outpatient evaluation of upper abdominal symptoms, and as in such cases survival is an inappropriate index of its utility we have in effect asked instead, "How often does upper gastrointestinal endoscopy affect patient management?"

The answer in our series must be that important management decisions were affected quite often. Seven patients were spared laparotomy and five came to surgery rather earlier as a result of fibre endoscopy. Three patients might have had their treatment changed to cimetidine had the study been carried out now rather than in 1975. The procedure may also be justified economically. The total cost per endoscopy at 1978-9 prices including salaries, general services, and depreciation of equipment is about £15 at the Royal Infirmary, Sheffield, and the average saving per surgical case avoided is about £450. At just over £1400 for 95 endoscopies, over £3000 for seven laparotomies was saved. (Allowing for sampling variation, the 95% confidence limits for the number of patients spared a laparotomy are about three to 15,<sup>3</sup> and hence the corresponding limits for the amount saved are about £1500-£7000.)

An investigation of how barium-meal findings affected management of patients with dyspepsia showed how infrequently treatment was changed after the investigation, particularly in patients under 50.<sup>4</sup> Our different findings for endoscopy largely reflect the different population studied. All had symptoms that a consultant physician or surgeon thought severe or persistent enough to warrant the procedure. Even so, all the patients whose management was changed to or from laparotomy were over 45, although 24 of the 95 patients studied were younger. The results of any such study must reflect the degree of selection used in referring and accepting patients for the procedure, but as it was carried out on consecutive patients accepted for endoscopy in four centres, we think it likely that it will be representative of conditions in many hospitals in Great Britain.

Other studies<sup>5,6</sup> have found more abnormalities on endoscopy in dyspeptic patients than on barium-meal examination, but we are not aware of any study also showing the value of endoscopy in management or its cost-effectiveness.

The standard of radiology is bound to affect the number of occasions on which endoscopy changes the diagnosis and therefore management. In Sheffield there has been an almost total change to double-contrast barium meals since this study was carried out, although in Doncaster these were standard in 1975. We have no doubt that improved radiological technique will result in fewer new diagnoses by endoscopy but think it unlikely that our overall results would be very different.

We therefore conclude that upper gastrointestinal fibre endoscopy carried out on patients with persistent symptoms and a normal barium-meal film or on those with abnormal films in whom some diagnostic doubt remains is very worth while, particularly in the middle-aged and elderly. Our results vindicate what is probably current clinical practice in most of

those hospitals in Great Britain where endoscopy is freely available. The procedure often facilitates an earlier decision on surgery and enables unnecessary laparotomy to be avoided. There can be few diagnostic techniques for which such strong claims could be made.

Costings of endoscopy and laparotomy were provided by Mr R Hull, Sheffield Area Health Authority Treasurer's Department.

Requests for reprints should be sent to Dr R A Dixon.

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# Carcinoembryonic antigen in breast-cancer tissue: a useful prognostic indicator

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## Summary and conclusions

Sections of breast carcinomas removed from 69 patients six to 13 years previously were examined using an immunoperoxidase technique to determine whether carcinoembryonic antigen (CEA) was present. Patients who had CEA-negative tumours had significantly higher five- and 10-year survival rates. The difference was not related to the stage of the disease, postoperative treatment, or histological type of tumour.

These results suggest that immunohistological assessment of CEA in breast-cancer tissue may provide more precise prognostic information.

## Introduction

Recently<sup>1</sup> we found a positive correlation between the presence of carcinoembryonic antigen (CEA) in sections of breast carcinomas and the presence of lymph-node metastases. This

further study was carried out retrospectively on a group of patients who had been followed up for six to 13 years after the surgical removal of their tumours.

## Patients and methods

We included in the study 69 patients who presented at the Royal Free Hospital during 1965-72 with breast carcinoma and were treated by mastectomy. Patients who were lost to follow-up or were known to have died from causes not related to the tumour were excluded. The first 55 patients were chosen randomly. We later included 14 consecutive patients without evidence of metastatic disease at the time of mastectomy to permit useful statistical comparison between patients in the same, early, stage of the disease.

Stored histological sections prepared from the mastectomy specimens and stained with haematoxylin and eosin were examined in all cases. Extra sections, 4 µm thick, were then cut in each case from one of the stored paraffin blocks that contained representative tissue of the primary tumour. These sections were stained for CEA using an immunoperoxidase method.<sup>1</sup> This entails reducing endogenous peroxidase by applying 0.5% solution of 30% hydrogen peroxide in methanol and reducing background staining by using 1:5 normal swine serum. The sections are treated consecutively with 1:50 rabbit anti-CEA serum and peroxidase-labelled swine anti-rabbit IgG. Thorough washing with TRIS (trimethamole) and saline buffer pH 7.6 is carried out between the various stages. The peroxidase activity is developed with 3, 3' diaminobenzidine tetrahydrochloride and the sections counterstained with celestine blue and mounted in Diatex.

Control sections of colon and breast carcinoma that were positive for CEA gave negative results when normal swine serum was substituted for rabbit anti-CEA serum and when this rabbit anti-CEA serum was absorbed with 1:50 solution of CEA in 0.05 M sodium phosphate buffer pH 7.5 (kindly supplied by Dr G T Rogers of the medical oncology department, Charing Cross Hospital). A different study showed that the same anti-CEA serum stained lipofuscin in normal human liver; the staining was abolished by absorbing the

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TABLE 1—Details of all 69 patients studied, according to absence or presence of CEA

Results of CEA staining	No (%) of patients	Mean age (years)	Histological type				No (%) surviving		No (%) with metastases at mastectomy
			Infiltrating duct	Lobular invasive	Tubular	Medullary	Five years	10 years	
Negative	14 (20)	54.1	9	1	3	1	13/14 (93)****	4/6 (67)***	2/14 (14)**
Positive	55 (80)	56.2	41	8	6		16/55 (29)****	4/34 (12)***	24/55 (44)**
++	26	55.8	18	4	4		4/26 (15)**	1/13 (8)*	10/26 (38)
+	29	56.6	23	4	2		12/29 (41)**	3/17 (18)*	14/29 (48)
Total	69 (100)	55.8	50	9	9	1	29/69 (42)	8/40 (20)	26/69 (38)

Significance of difference: \*P < 0.5; \*\*P < 0.05; \*\*\*P < 0.01; \*\*\*\*P < 0.001.