A case of 'Crohn's carcinoma'

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SUMMARY A case of adenocarcinoma of the ileum, occurring in an area concomitantly the site of Crohn's disease, is described. Examination of the literature suggests that there are certain characteristics of the small bowel carcinoma which arises in Crohn's disease. These include invisibility of the tumour on macroscopic inspection, dysplasia in the surrounding mucosa, and a peculiar endometriosis-like pattern of invasion. The finding that these tumours have certain characteristics is taken as evidence that carcinoma is a complication of Crohn's disease of the small bowel.

Adenocarcinoma of the small bowel in an area which is concomitantly the site of Crohn's disease was first described in 1956 by Ginzberg, Schneider, Dreizin, and Levinson. It has since been regarded as a rarity with Darke, Parks, Grogono, and Pollock (1973) recently reporting one case and reviewing the literature of a further 24 cases. The association between the two diseases is not perhaps as rare as has been suggested, as we have been able to find 12 more cases in the literature, and recently had experience of a case of our own, making a total of at least 36 reported cases (table I).

Case Report

M.B., a woman aged 55 years, presented as an out-patient in July 1971 with a four-week history of right-sided abdominal pain, nausea, and vomiting. There was no bowel upset but the patient had lost weight during the previous four weeks. The only feature of note in her past history was pulmonary tuberculosis 25 years previously, for which a left thoracoplasty had been performed.

On clinical examination the only abnormalities were evidence of weight loss and a tender mass in the right iliac fossa. The ESR was 22 mm in the first hour (Westergren) and on barium examination a narrowed, irregular segment of terminal ileum with loss of mucosal patterning was seen (fig 1).

A provisional diagnosis of appendix mass was made and the patient was seen at monthly intervals for nine months, during which time the mass slowly resolved. Two further barium enemas and a barium meal showed that the narrowed area in the terminal ileum was unchanged from its first appearances.

During this period the patient was free of symptoms.

A year after her first attendance her symptoms returned and it was decided to carry out a laparotomy. Preoperative investigations were normal apart from a slightly elevated level of IgG of 2570 mg/100 ml (normal 600-1200 mg/100 ml).

At operation the terminal ileum was thickened and adherent to the right Fallopian tube. The appendix was shrunken and fibrotic. The appearances were those of Crohn's disease of the terminal ileum in a quiescent phase, and an excision of the affected portion of the ileum and part of the caecum and ascending colon was carried out, with end-to-end

Fig 1 Barium enema showing a narrowed irregular segment of terminal ileum with loss of the mucosal pattern.

Author	Age	Sex	Site of Tumour	Bypass	Diagnosed Macroscopically	Dysplasia Present	Endometriosis-like Invasion
Ginzberg <i>et al</i>	30	M	Jejunum	No	Yes	No	—
Kornfeld <i>et al</i>	36	F	Jejunum	No	Yes	No	No
Bersack <i>et al</i>	26	M	Small intestine, caecum, and ascending colon	No	No	No	—
Lear	—	—	Ileum	No	No	No	—
Buchanan <i>et al</i>	47	M	Ileum	No	No	No	Yes
Weingarten <i>et al</i>	44	F	Jejunum	Yes	Yes	No	Yes
Weingarten and Weiss	28	F	Ileum	Yes	Yes	—	—
Zisk <i>et al</i>	61	F	Ileum	No	Yes	No	Yes
	62	F	Ileum	Yes	Yes	No	—
Steele and McNeely	38	M	Ileum	Yes	Yes	Yes	—
Almond <i>et al</i>	48	F	Ileum	No	Yes	No	—
Marshak	Two cases		— no details				
Hoffert <i>et al</i>	40	M	Ileum	No	No	No	Yes
Berman and Prior	51	M	Ileum	No	No	Yes	Yes
Sheil <i>et al</i>	40	F	Ileum	No	No	No	—
Cantwell <i>et al</i>	60	M	Ileum	No	No	Yes	Yes
Morowitz <i>et al</i>	41	M	Ileum	No	No	No	Yes
Tyers <i>et al</i>	32	M	Jejunum	Yes	No	Yes	No
Wyatt	33	M	Ileum	No	No	Yes	Yes
Magnes and DeBell	71	M	Ileum	No	Yes	No	—
Farmer <i>et al</i>	43	M	Jejunum	Yes	No	—	No
	61	F	Jejunum	No	Yes	—	No
Brown <i>et al</i>	55	F	Ileum	Yes	No	—	—
Goldman <i>et al</i>	21	F	Jejunum	No	No	No	No
Schuman	35	M	Ileum	Yes	No	No	—
Papp and Pollard	39	M	Small intestine	No	Yes	—	No
Rha <i>et al</i>	38	M	Ileum	No	No	No	Yes
Bruni <i>et al</i>	51	M	Ileum	No	Yes	—	No
	60	M	Ileum	Yes	Yes	No	No
Clemmensen and Johansen	70	M	Whole length of bowel	No	Yes	—	No
Schofield	Mid 20s	M	Ileum	No	—	—	—
	Mid 20s	M	Ileum	Yes	—	—	—
Frank and Shorey	48	M	Ileum	Yes	Yes	No	—
	55	F	Ileocaecal	Yes	Yes	No	—
Darke <i>et al</i>	60	M	Ileum	No	No	Yes	—
Fleming (present case)	55	F	Ileum	No	No	Yes	Yes

Table I Reported cases of 'Crohn's carcinoma'

anastomosis of ileum and colon. There was no evidence of carcinoma at operation. The patient had an uneventful recovery and was discharged home 12 days after her operation. One month later she was in good health, and all investigations at that time were normal including the plasma IgG. She has been seen regularly since then and remains well with no evidence of active disease two years after the operation.

Pathological Findings

MACROSCOPIC APPEARANCE

The operative specimen consisted of a portion of terminal ileum and mesentery, the caecum and appendix and a small part of the ascending colon, the total length 40 cm. There was a thickening and inflammation of the terminal ileum, starting 20 cm from the proximal resection margin and extending to the ileocaecal valve. The appendix was also inflamed and adherent to the caecum. On opening the ileum, the thickened portion was stenosed, with

irregular ulceration of the mucosa, and in the centre of the most narrowed area there was an intramural abscess on the mesenteric border. The caecum and colon were normal. Carcinoma was not suspected on macroscopic examination.

MICROSCOPIC EXAMINATION

The terminal ileum distal to the severely stenosed area showed focal ulceration of the mucosa, with a marked increase in chronic inflammatory cells in the lamina propria. The submucosa was thickened by oedema and lymphangiectasia, with scattered lymphoid follicles and a diffuse chronic inflammatory infiltrate (fig 2). These changes were also present in the muscle coats and the serosa. The appendiceal mucosa was totally ulcerated, but otherwise the changes were similar to those in the ileum. Lymph nodes from the mesentery showed only reactive changes and no sarcoid granulomata were found.

The appearances were of Crohn's disease of the terminal ileum and appendix. In the area around the intramural abscess the picture was similar but with

Fig 2 Terminal ileum showing ulceration and diffuse inflammation of the submucosa. Haematoxylin and eosin $\times 42$.

more severe ulceration and formation of fissures, one of which appeared to have given rise to the abscess. The epithelium in this area was dysplastic with scattered small foci of more normal epithelium (fig 3). In all the layers of the bowel wall numerous acini were seen passing through to the serosal surface (fig 4) and in the muscle coats some of these acini were present in perineural spaces (fig 5). These appearances were interpreted as a moderately well differentiated adenocarcinoma of the ileum arising in an area of Crohn's disease, with, in the surface epithelium, dysplastic epithelium amounting to carcinoma *in situ*.

Discussion

The most important question resulting from this and similar cases is whether the adenocarcinoma in some way arose as a result of the Crohn's disease, or whether the two diseases occurred purely coincidentally. A consideration of the literature (table I) shows some of the features of the reported cases of 'Crohn's carcinoma' and these are summarized in table II. Also in table II are data from eight cases of consecutive carcinomata of the small intestine ('carcinoma *de novo*') seen at the Western Infirmary Glasgow during 1953-1965 (Lee, 1974). These data are in general agreement with those given for this type of tumour by Evans (1966), Willis (1967), and Morson and Dawson (1972).

By comparing the features of the two types of

Fig 3 Ileal epithelium showing severe dysplasia. Haematoxylin and eosin $\times 560$.

Fig 4 Endometriosis-like pattern of invasion. Haematoxylin and eosin $\times 168$.

Fig 5 Nerve with perineural adenocarcinoma. Haematoxylin and eosin $\times 168$.

tumour in a similar manner, Darke *et al* (1973) and Frank and Shorey (1973) showed differences in the age at diagnosis, the site and the prognosis, and, as seen in table II, we have been able to confirm their first two findings from our own cases. The existence of these differences suggests that the carcinoma occurring in Crohn's disease of the small bowel is not a coincidental carcinoma *de novo*.

In addition, there are three pathological features sometimes mentioned in descriptions of Crohn's carcinoma which were present in our own case and are distinct enough to warrant more emphasis than

they have been given previously. These were not present in any of the eight cases of carcinoma *de novo* which were examined, and are not mentioned in textbook descriptions of that tumour (Evans, 1966; Willis, 1967; Morson and Dawson, 1972). We have endeavoured to determine the incidence of these features in previously reported cases (tables I and II), although some reports do not give sufficient detail to allow precision. The first feature is the 'invisibility' of the tumour. Of 33 cases in which sufficient detail has been given, the carcinoma was not suspected in 17 (51%), either at operation or on

	Age at Diagnosis (years)	Ratios		Bypass (%)	Invisibility (%)	Dysplasia (%)	Endometriosis- like Invasion (%)
		Male: Female	Duodenum Jejunum: Ileum				
Crohn's carcinoma	46.2 (21-71)	2:1 approxi- mately (22:12)	1:3.5 approxi- mately (7:25)	34 (12:35)	51 (17:33)	27 (7:26)	38.5 (10:26)
Carcinoma <i>de novo</i>	57.3 (29-74)	2:1 approxi- mately (5:3)	1:1 (4:4)	0	0	0	0

Table II Comparison of Crohn's carcinoma and carcinoma *de novo*

macroscopic examination by the pathologist. The second is the presence around the tumour of dysplasia of the mucosal epithelium which may amount in places to carcinoma *in situ*. This was noted in seven out of 26 cases (27%). The third finding is that of a peculiar pattern of invasion in which quite separate, discrete acini pass through the bowel wall in a manner reminiscent of endometriosis, although there is no stroma surrounding the acini. The rate of occurrence of this endometriosis-like pattern of invasion is much more difficult to assess, but in 10 out of 26 cases (38.5%) something similar appears to have been present. It is interesting that the first two features are present commonly in carcinomata arising in chronic ulcerative colitis.

On consideration of all the above evidence, we feel that 'Crohn's carcinoma' has sufficient differences from carcinoma *de novo* to conclude that it is a definite complication of Crohn's disease of the small bowel. Therefore this possibility should be actively considered in any patient with Crohn's disease of the small bowel, who shows a sudden deterioration in his condition. In addition the fact that 12 out of 35 cases (34%) occurred in surgically bypassed bowel argues against this form of treatment.

We wish to thank Mr J. S. F. Hutcheson, consultant surgeon, Glasgow Royal Infirmary, for his permission to publish this case, and both him and Dr B. C. Morson, consultant pathologist and Director of the Research Department, St Mark's Hospital, London, for their help and encouragement in the preparation of this paper.

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