

## Adenocarcinoma of the appendix

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### Summary

Patients presenting with adenocarcinoma of the vermiform appendix at the Royal Preston and Chorley District General Hospitals were reviewed for the 15 year period 1972-1986. Eleven cases were identified, representing a rate of 1 in 956 for all appendicectomies performed.

A third of the cases presented as acute appendicitis. However, of 8 patients who initially had an appendicectomy, only 4 subsequently underwent further surgery (right hemicolectomy). One patient died of recurrent disease. Five of the patients presenting were under 60 years of age.

During the same period, the total number of appendicectomies performed annually declined by 50%.

The study highlights the need to subject all appendicectomy specimens to histological examination, and that the disease presents in a younger age group than commonly seen for malignant colonic neoplasms.

### Introduction

Carcinoma of the appendix is infrequently diagnosed preoperatively, only being confirmed after histological examination. It would appear that the macroscopic appearance of the appendix is of no value in deciding whether neoplasia is present. There is then the dilemma of whether to subject the patient to further surgery to ensure complete clearance of tumour.

This study was initiated following a case of a 74-year-old man. Appendicectomy for an acutely inflamed appendix had been performed but after histological examination, was coincidentally found to have a well differentiated mucinous adenocarcinoma of the appendix. This patient then refused further elective surgery.

The experience of adenocarcinoma of the appendix within the population of Preston Health Authority is described and the outcome of patients diagnosed reviewed.

### Methods

All cases of appendicectomy from 1972 to 1986 were reviewed retrospectively, utilizing the Regional Health Authority Hospital Activity Analysis records for the Preston and Chorley Hospitals, retrieving all case notes of patients shown subsequently to have histological evidence of carcinoma of the appendix.

### Results

During the 15 year period studied, a total of 10 526 appendicectomies were performed, of which 6210 were undertaken as an emergency procedure. Over the same period, 11 cases of adenocarcinoma of the

appendix were identified, representing a rate of 1 in 956 for all appendicectomies performed. Review of the histology of 3 other cases identified these as being carcinoid tumours and were therefore excluded from the study.

The mean age of presentation was 61 years (33-82), with no difference in sex incidence. However, 5 of the patients were under 60 years of age (45%). Eight patients had undergone emergency appendicectomy for right iliac fossa signs (73%), of whom 4 patients had coincidental histological evidence of appendicitis. Four patients subsequently underwent further surgery for a right hemicolectomy.

Three of the 11 patients had undergone elective surgery and the diagnosis was made at laparotomy: (BR) undergoing a right hemicolectomy, (TF) an abdominoperineal resection and hysterectomy and (HO) an appendicectomy (Table 1).

Five patients have since died, one (BR) from metastatic spread of the original tumour.

Histology of the tumours showed adenocarcinoma of a mucin secreting type in 5 patients, all but 2 of the 11 patients had well differentiated histological appearances. On review of the histology, 3 patients probably had metastatic deposits of adenocarcinoma in the appendix, 2 (HO and NG) from an unknown primary, and one (TF) probably from a carcinoma of the uterus.

Of the 5 patients who underwent right hemicolectomy, 3 had evidence of lymphatic spread by the tumour on histological examination of the resected specimen. One of the 'second procedure' right hemicolectomy patients had residual tumour in the vicinity of the appendix stump.

The total number of appendicectomies performed over the 15 year period, showed a 50% reduction in the number of operations performed between 1972 and 1986. However, the ratio of elective to emergency procedure has remained constant (Table 2). Despite the fall in the number of appendicectomies performed, the number of cases of carcinoma of the appendix detected per annum has remained relatively constant except for those years when there were none.

### Discussion

Carcinoma of the appendix is rare. It is reported as occurring in 1 in 700 to 1 in 30 000 of appendicectomy specimens<sup>1,2</sup>. It accounts for only 4% of all tumours of the appendix<sup>3</sup>, carcinoid tumours being the most common.

Presentation clinically is variable but 44% are detected after emergency appendicectomy for diagnosed appendicitis<sup>4</sup>. Macroscopic appearance at operation may be confused with inflammatory changes attributed to acute appendicitis and an accurate

Table 1. Adenocarcinoma of the appendix 1972-1986

Patient	Sex	Age	Date	Pathology	Comment
HO	M	68	1972	Necrotic undifferentiated carcinoma●	Died ▲
WG	M	45	1972	Adenocarcinoma	Right hemicolectomy ■
VL	F	64	1973	Poorly differentiated mucinous adenocarcinoma	Appendicitis
JF	M	76	1976	Well differentiated mucinous appendicular carcinomatosis	Died
NG	F	49	1979	Well differentiated adenocarcinoma●	Appendicitis
TF	F	75	1979	Well differentiated adenocarcinoma●	Died ▲
CI	F	33	1980	Well differentiated mucinous adenocarcinoma	Right hemicolectomy ■
BR	M	82	1980	Adenocarcinoma	Right hemicolectomy; died of metastases ▲
TB	M	49	1981	Well differentiated mucinous adenocarcinoma	Appendicitis; right hemicolectomy ■
EF	F	57	1983	Well differentiated adenocarcinoma	Right hemicolectomy ■
JM	M	74	1986	Well differentiated mucinous adenocarcinoma	Appendicitis

●Metastatic deposits; ■ second procedure; ▲ elective surgery

Table 2. Number of appendicectomies performed 1972-1986

Year	Total	Emergency	No. of cases of carcinoma of the appendix
1972	968	596	2
1973	1095	646	1
1974	1131	586	0
1975	547	337	0
1976	873	561	1
1977	782	423	0
1978	804	399	0
1979	725	447	2
1980	640	385	1
1981	537	342	2
1982	485	296	0
1983	494	285	1
1984	529	308	0
1985	442	220	0
1986	474	269	1
Total:	10 526	6210	11

diagnosis only made after histological examination of the specimen. Frozen section of a suspicious appendix has been advocated<sup>5,6</sup>.

Management after diagnosis is dictated by the histological appearances of the tumour and the age of the patient. Appendicectomy alone is probably adequate if the tumour is confined to the mucosa, but this is difficult to determine<sup>6</sup>. Right hemicolectomy is associated with improved survival, 60% at 5 years compared to 20% without further resection<sup>4</sup>. The prognosis is poor if the tumour is associated with perforation<sup>7</sup>.

In this study, right hemicolectomy was performed in 5 of the 11 patients, one of whom died of metastatic disease.

Over half of the patients who underwent right hemicolectomy had evidence of lymphatic invasion, or there was incomplete removal of the tumour at the time of the original appendicectomy. The remaining patients who did not have further surgery after appendicectomy, were either unfit, or refused resection.

The results of this study indicate the importance of subjecting all appendicectomy specimens to histolo-

gical examination, since the macroscopic appearances of adenocarcinoma of the appendix may be unrecognized. Right hemicolectomy is advised on diagnosis for primary adenocarcinoma of the appendix, as lymphatic spread or residual tumour is common<sup>8</sup>.

It is reported that a higher incidence (25%) of colonic neoplasms is seen in this group of patients<sup>9</sup>. Management, after appendicectomy has revealed a carcinoma, should therefore include examination of the rest of the large bowel either by colonoscopy or barium studies where possible, prior to performing definitive resection.

The decline in appendicectomy rates over the period of study may reflect the change in operative policy, the improved diet of the population and a decline in the incidence of acute appendicitis. It is interesting to speculate if this trend may result in an increased number of cases of appendicular adenocarcinoma in future years within the local population who might otherwise have undergone appendicectomy.

#### References

- Collins DC. A study of 50,000 specimens of the human vermiform appendix. *Surg Gynecol Obstet* 1955;101:437-45
- Warren S, Warren AS. A study of 6797 surgically removed appendices. *Ann Surg* 1926;83:222-6
- Ulhein A, McDonald JR. Primary adenocarcinoma of the appendix resembling carcinoma of the colon. *Surg Gynecol Obstet* 1943;76:711-4
- Hesketh KT. The management of primary adenocarcinoma of the vermiform appendix. *Gut* 1963;4:158-68
- Didolkar MS, Fanous N. Adenocarcinoma of the appendix: a clinicopathological study. *Dis Colon Rectum* 1977;20:130-4
- Sieracki JC, Tesluk H. Primary carcinoma of the vermiform appendix. *Cancer* 1956;9:997-1011
- Brown HW, Husni EA. Ruptured adenocarcinoma of the appendix: review of the literature and case presentations. *Surgery* 1957;42:953-9
- Pattersom HA. The management of caecal cancer discovered unexpectedly at operation for acute appendicitis. *Ann Surg* 1956;143:670-81
- Wolf M, Ahmed N. Epithelial neoplasma of the vermiform appendix exclusive of carcoid. *Cancer* 1976;37:2511-22

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