two live anencephalics and the absence of histological degenerative changes in the placenta in the present series suggests the possibility of interfering with placental hormone production without necessarily affecting placental transport function. This may well be the case, as Cassmer (1959) has produced experimental evidence that dissociation of even oestrogen and progesterone production by the placenta can occur. The successful induction of labour in four patients when the glucose concentration of the amniotic fluid was always less than 5 g./100 ml. suggests that replacement of the amniotic fluid with solutions of lower tonicity than 50% glucose may also be effective in the termination of pregnancy.

Bengtsson and Csapo's theory that the onset of labour is due to a fall in progesterone production by the placenta is an attractive one and is supported by their endocrinological and histological findings. We have, unfortunately, no comparable endocrinological studies of the plasma progesterone before and after the injections (see Addendum), but gross and histological examination of the membranes and placenta disclosed no evidence of change in any of our cases. While this is in contrast to their findings of haemorrhages and infarcts of the placenta, it is in agreement with Brosset's findings in mid-pregnancy.

The association of deaths due to hypoxia with low urinary pregnanediol and deaths due to hydrops or foetal abnormality with normal levels is interesting. Von Wagenan and Jenkins (1939) first showed in the rhesus monkey that removal of the foetus early in pregnancy did not disturb the placenta, which remained *in situ* and active till near term. Cassmer (1939) showed that interruption of the circulation in the human umbilical cord during mid-pregnancy was followed by a rapid fall in urinary oestrogen but only a slight decrease in urinary pregnanediol. His experiments indicated that the foetal circulation is essential for the maintenance of the urinary oestrogen levels in pregnancy but not for the production of progesterone. If we assume that the hypoxic deaths in our series are secondary to placental failure, and if the deaths due to hydrops are regarded as primarily foetal, then our findings of low pregnanediol and low oestrogen levels in the former and low oestrogen levels only in the latter are in agreement with Cassmer's results.

Summary

Labour was successfully induced during the last trimester by injecting 50% glucose solution into the amniotic cavity through the abdominal wall. The method was used in 22 consecutive patients with foetal abnormalities or intrauterine death.

The method appears to be simple, safe, and sure, and would seem to be worthy of more extensive trial. All patients were delivered spotaneously within 96 hours of induction, and labour was less than 13 hours in all cases.

In several patients serial measurement of the amniotic glucose concentrations revealed values that were always less than 5 g./100 ml., which suggests that the replacement of the amniotic fluid with solutions of lower tonicity than 50% glucose might also be effective in the induction of labour.

The interval between induction and onset of labour was usually short when the urinary pregnanediol excretion was low. When foetal death was due to hydrops foetalis the urinary pregnanediol excretion was normal, but when death was associated with post-mortem evidence of foetal hypoxia it was usually low.

Evidence is given that the onset of labour following this procedure is not due to a change in uterine volume nor to a direct effect of the glucose upon the myometrium; available data suggest that the intra-amniotic injection of 50% glucose induces labour by diminishing placental progesterone production.

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ADDENDUM.—Since the completion of this study blood-progesterone estimations have been performed on two patients, one with a live anencephalic and one with a dead foetus. The blood-progesterone levels before and 3 to 17 hours after the intra-amniotic injection of 50% glucose showed no significant difference.

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UNRECOGNIZED CARCINOMA OF CAECUM PRESENTING AS ACUTE APPENDICITIS OR APPENDIX ABSCESS

BY

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The classical manifestations of carcinoma of the caecum, such as anaemia, loss of weight, and a mass in the R.I.F., in patients of cancer age hardly pose a problem in diagnosis; but when caecal cancer presents for the first time in an emergency as acute appendicitis or appendix abscess diagnostic difficulties become great, and not infrequently the basic lesion goes unrecognized long enough to spoil the prospects of surgical cure. In an analysis of a series of cases of cancer of the right colon Mayo (1947) reported that 15% and Ransom (1952) that 11% of the patients had had their appendix removed without recognition of the underlying carcinoma. Similar mistakes have been reported by Costello and Saxton (1951), and by Hellsten and Ramström (1951). Undoubtedly appendicitis in association with carcinoma of the caecum occurs more often than is realized and will become more frequent with the increase of ageing population.

The number of cases of the dual condition so far reported in the literature is not large. Probably delay in diagnosis and poor results discourage publication. Sometimes emergency appendicectomy and treatment of the carcinoma are not carried out in the same hospital.

McLaughlin (1946) collected 11 cases and added one of his own. Thomas (1953) found 28 cases in the literature. Feldman (1958) found 69 cases and reported one additional case. My own study of the literature revealed 79 cases. In this paper a series of eight cases are presented. In seven cases appendicitis was associated with carcinoma, making a total of 86. In one case carcinoma of colon simulated appendicitis. The accompanying Table gives details of all the cases.

As delay in diagnosis and multiple operations lead to many tragedies, it was felt that a critical review of the problems of diagnosis and management may prove useful in dealing with similar cases in future.

Discussion and Comments

Acute appendicitis may be the first symptom of carcinoma of the caecum, especially in patients past middle age. Since 50% of appendicitis cases are produced by obstructive lesions (Collins, 1939) it is not surprising that a malignant growth in the caecum can cause appendicitis by obstruction of the lumen of the appendix or its blood-vessels or lymph vessels. When appendicitis and carcinoma of the caecum coexist the symptomatology of appendicitis dominates the picture. While anaemia, loss of weight, or changes in the bowel habits would favour a diagnosis of carcinoma, such symptoms are by no means always present, and in fact most of the patients had no complaint suggesting malignancy. The only diagnostic aid is suspicion based on the fact that appendicitis secondary to carcinoma of the caecum is not so uncommon in patients past middle age.

The diagnosis may not be made even at the first operation. An inflamed appendix may be removed without recognizing the underlying carcinoma (Thomas, 1953; Patterson, 1956; Feldman, 1958) unless the surgeon carefully examines the caecum, especially the posterior surface. In an adherent caecum such examination is possible only after dissection and delivery of the organ through adequate exposure. Where an inflammatory induration cannot safely be distinguished from malignant infiltration an *x*-ray study of the caecum is imperative. In such a situation Markgraf (1958) recommends caecotomy for inspection and frozen section. When caecum and appendix look healthy,

Details of Cases

Case No.	Age and Sex	Preoperative Findings. Diagnosis	Primary Operation	Subsequent Course and Operations	Clinical and Pathological Diagnosis	Result
1	M 68	Excellent past health 36 hours abdominal pain, initially periumbilical, later moved to R I F.; nausea; temp 99·8° F (37·7 C.). Tenderness and rigidity in R.I F. Rovsing sign positive. Tender P R. Leucocytes 14,500, polys 80%. Acute appendicitis	Paramedian incision. Appendix abscess, little pus. Decided to await resolution. Mass diminished in size under conservative treatment. Barium enema 5 months later reported carcinoma of caecum	Second operation: right hemicolectomy and segmental resection of pelvic colon for carcinoma of caecum invading pelvic colon. 6 months later metastatic lump from abdominal wall excised. Despite radiotherapy, in next 6 months developed generalized carcinomatosis	Adenocarcinoma of caecum invading appendix with lymph nodes deposit. Inflammatory changes in appendix	Died at time of writing this
2	F 48	Reasonable past health. 8 hours abdominal pain, nausea, vomiting, temp. 100° F. (37·8 C.). Upper abdominal pain became localized to R.I.F., which was tender and rigid. Leucocytes 16,880, polys 89%. Acute appendicitis	Laparotomy. Inflamed appendix and firm indurated growth within caecum discovered. Prompt right hemicolectomy	Satisfactory post-operative course	Inflamed appendix. Adenocarcinoma of caecum blocking lumen of appendix	No further trouble
3	M 57	Previously healthy. Abdominal pain, anorexia, nausea 12 hours. Original central abdominal pain shifted to right lower quadrant. Guarding and tenderness with rebound in R.I F. Tender P R. Temp. 99 F. (37·2 C.). Leucocytes 13,000, polys 85%. Acute appendicitis	Gridiron incision. Inflammatory mass surrounding appendix with little pus. Mass could not be mobilized through gridiron incision. Wound closed. Barium enema report negative	At reoperation 3 weeks later appendix abscess reduction confirmed. Third operation 5 months later: resection of caecum and terminal ileum for inseparable adhesions round appendix. Pathologist found carcinoma in specimen. 4th operation: radical resection of right colon. Subsequently 2 operations for complications of recurrences	Carcinoma of caecum invading base of appendix. Appendix showed inflammatory changes	Died 8 months later
4	F 61	1 day's right lower abdominal pain, nausea, vomiting, temp. 100° F. (37·8 C.). Lost 2 st. (12·7 kg.). Tenderness, rigidity in R.I.F. Tender P.R. Leucocytes 12,100, polys 79%. Acute appendicitis	Appendix abscess drained	Readmitted in 8 weeks with intestinal obstruction. Laparotomy showed carcinoma of caecum causing obstruction. Ileotransverse anastomosis	Carcinoma of caecum invading base of appendix with abscess formation	Died of renal failure
5	M 51	Appendicectomy in another hospital 4 months ago. Intermittent pain in R.I.F. Lost weight. Tender lump R.I.F. Barium-enema interpreted as carcinoma of caecum	Paramedian incision. Carcinoma of caecum confirmed. Right hemicolectomy	Satisfactory post-operative course	Carcinoma of caecum infiltrating area round base of appendix	Lost to follow-up
6	F 56	10 days' right lower quadrant pain, anorexia, constipation, temp 99° F. (37·2 C.). Tender lump R.I.F. Tender P.R. Leucocytes 12,000. Hb 72%. Appendicitis	Laparotomy. Inoperable carcinoma of caecum invading appendix and causing pressure on ureter and iliac vein	Stormy post-operative course	Carcinoma of caecum invading appendix. Inflammatory changes in appendix	Died 3 months later
7	M 72	Several days' localized pain, tenderness in R.I.F., anorexia, pyrexia. Attended with tender soft swelling in R.I.F discharging pus. Leucocytosis. Treated with antibiotics. Mass got smaller. Appendix abscess	After 2 months laparotomy revealed carcinoma of caecum. Right hemicolectomy	Satisfactory post-operative course	Carcinoma of caecum invading appendix with abscess formation	Too early to comment
8	F 43	2 days' right-sided abdominal pain localized to R.I.F., nausea, anorexia, temp. 99·8° F (37·7 C.), constipation for several days. Tenderness and guarding R.I.F. Acute appendicitis	Laparotomy. Ring carcinoma right colon. Right hemicolectomy	Uneventful post-operative course	Carcinoma, right colon simulating appendicitis	No further trouble

examination of the colon for cancer masquerading as appendicitis is worth while (Case 8).

An ileocaecal mass exposed at operation for appendicitis can be a diagnostic problem, because a wide range of pathological conditions produce inflammatory masses with an identical picture. Out of 85 ileocaecal masses reported by Roberts (1959), 17 distinct pathological states were found. As many of these lesions are better treated by hemicolectomy, it seems reasonable to resect a suspicious lesion rather than to leave what may prove to be a deadly carcinoma. When conservative treatment is proposed for such a mass with the impression of appendicitis radiological investigation should on no account be neglected. Reduction in size of a mass does not rule out malignancy (Cases 1, 3, and 7).

An appendix abscess discovered at operation calls for careful examination of the caecum for a hidden carcinoma (Cases 1, 3, 4, and 7). In Miller and Wooldridge's (1954) patient examination of pus led to the discovery of cancer cells.

Faecal fistula, recurrent abscesses, or discharging sinuses (Coulter, 1957; Burt, 1949; Thomas, 1953, Case 5) following appendicectomy may originate from unrecognized carcinoma of the caecum and require prompt investigation and often exploratory operation.

A detailed *x*-ray study of the caecum, including oblique views, spot, evacuation and air contrast films, and repeat *x*-ray films in doubtful cases should form an essential part of the investigation. Casual and hurried examinations have caused many catastrophic delays (Bartlett and Miller, 1940; Patterson, 1956; Case 3).

When carcinoma of the caecum is discovered at operation for appendicitis in a fit patient prompt resection—that is, right hemicolectomy—is the procedure of choice. "The first chance at these tumours is the best" (Patterson, 1956). Primary resection of the right colon without adequate bowel preparation seems no more risky than a similar resection of small gut at an emergency. The fluid contents and complete peritoneal covering of ileum and transverse colon ensure safe anastomoses. Instillation of 100 ml. of 1% solution of neomycin into the colon at the time of resection provides additional safeguard. Perforation (Hinshaw and Carter, 1960) or presence of pus (Coulter, 1957) does not contraindicate radical resection.

Conservative treatment should be reserved for gravely ill patients in whom provision of simple drainage for large quantities of pus, exteriorization of colon for perforation, and intestinal by-pass in obstruction offer good palliation, and should be followed by effective tumour operation, which is right hemicolectomy.

Summary

Seven cases of appendicitis secondary to carcinoma of the caecum and one case of carcinoma of colon simulating appendicitis are described.

The problems of diagnosis and management are made clear by a study of the relevant literature.

A plea is made for a careful examination of the caecum during appendicectomy and a detailed *x*-ray study of the caecum in cases of appendix abscess, sinus, fistula, and inflammatory mass in elderly people. Only in this way is the incidence of unrecognized carcinoma of the caecum likely to be reduced.

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Medical Memoranda

Tuberculous Endometritis Diagnosed 12 Days After Abortion

In recent years there has been renewed interest in the subject of genital tuberculosis in women. Particular attention has been paid to the relationship between infertility in the female and genital tuberculosis, but little has been written of genital tuberculosis in the immediate postpartum period.

In a ward reserved for the treatment of septic abortions and puerperal pyrexia a rise in a patient's temperature after abortion does not in itself give much cause for comment. It is often difficult to ascertain whether the abortion was spontaneous or induced, under anything but aseptic conditions. However, when the pyrexia continues despite antibiotic therapy it is important to consider other, less common, causes for this state of affairs.

It was in circumstances such as these that the cause of pyrexia in the following case was diagnosed and treated.

CASE REPORT

A married woman aged 31 was admitted to Robroyston Hospital in the evening of October 23, 1961. On admission her condition was satisfactory and she had no previous medical history of note. She had had two abortions—one in 1955 and one in 1956. These had occurred spontaneously at three months and neither required further treatment after the abortion had completed itself. In 1959 she had an uneventful pregnancy and was delivered of a healthy male child weighing 8 lb. 3 oz. (3,715 g.). The puerperium was uneventful, and from that time until the start of the present pregnancy her menstrual cycle had been regular, lasting for three days in every 28.

On examination after admission the patient was found to be 20 weeks pregnant, and was having regular uterine contractions. Vaginally there was a loop of cord presenting at the introitus, the cervix was dilated two fingerbreadths, and the foetus could be felt in the cervical canal.

The next morning the foetus was manually removed from the vagina and the placenta delivered by the Brandt-Andrews method. Blood loss was minimal.