THE ACUTE ABDOMEN IN MILITARY SURGICAL PRACTICE

A Clinical Study of 430 Consecutive Cases of Acute Abdominal Disease Submitted to Operation in the General Surgical Unit of the Cambridge and Louise Margaret Military Hospitals During the Twenty-month Period October 15, 1946, to August 14, 1948

BY

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This paper is presented as a clinical analysis rather than as a scientific article. It records a consecutive series of 430 cases and demonstrates one aspect of the work carried out in military practice in Peace. The series is not in any way a personal one, although I was, naturally, concerned with the diagnosis and treatment of a large number of them. The operations were performed by a number of Surgeons whose names appear in the text. Some have now been released from Army Service.

Most cases have been young soldiers but the extremes of age varied from 2 days to 50 years. The overall mortality was 2. The first, a case of imperforate anus, died on the third day of life following left-sided colostomy. The second, a case of appendicular abscess, is referred to later. Twenty-two of the cases occurred in families personnel and operation was performed by the general surgeons of the Cambridge in the Louise Margaret Hospital. No gynaecological emergencies have been included in the series with the exception of two A.T.S. personnel suspected to be suffering from appendicitis but proved to be hemorrhages into ovarian cysts.

The 430 cases are classified as follows:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute appendicitis</td>
<td>364</td>
</tr>
<tr>
<td>Perforated peptic ulcer</td>
<td>14</td>
</tr>
<tr>
<td>Acute intestinal obstruction</td>
<td>11</td>
</tr>
<tr>
<td>Regional ileitis</td>
<td>3</td>
</tr>
<tr>
<td>Strangulated hernia</td>
<td>3</td>
</tr>
<tr>
<td>Intussusception</td>
<td>2</td>
</tr>
<tr>
<td>Bleeding peptic ulcer</td>
<td>2</td>
</tr>
<tr>
<td>Haemorrhage into ovarian cyst</td>
<td>2</td>
</tr>
<tr>
<td>Subphrenic abscess</td>
<td>2</td>
</tr>
<tr>
<td>Rupture bladder</td>
<td>4</td>
</tr>
<tr>
<td>Internal hemorrhage</td>
<td></td>
</tr>
<tr>
<td>Torsion of omentum</td>
<td>1</td>
</tr>
<tr>
<td>Imperforate anus</td>
<td>1</td>
</tr>
<tr>
<td>Acute pancreatitis</td>
<td>1</td>
</tr>
<tr>
<td>Perforating wound stomach</td>
<td>1</td>
</tr>
<tr>
<td>Lymphangiomatosis</td>
<td>1</td>
</tr>
<tr>
<td>No lesion demonstrable at operation</td>
<td>16</td>
</tr>
</tbody>
</table>

Total 430
The appendicitis series is further analysed.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>localized to the appendix</td>
<td>304</td>
</tr>
<tr>
<td>with local peritonitis</td>
<td>33</td>
</tr>
<tr>
<td>with abscess formation</td>
<td>15 (1 died)</td>
</tr>
<tr>
<td>with diffuse peritonitis</td>
<td>12</td>
</tr>
</tbody>
</table>

**COMMENTS ON THE APPENDICITIS SERIES**

*The History, Signs and Symptoms.*—A tentative diagnosis of acute gastritis should always be received with caution. Apart from alcoholism and some forms of poisoning, it is doubtful if acute gastritis is a clinical entity. It is more doubtful still as a differential diagnosis in acute appendicitis. Repeated vomiting and nausea rather than pain should be its main features. Too often this diagnosis cloaks failure to obtain an accurate history or make an adequate examination.

A young soldier whose intermittent pain, at first central, moves after a few hours to a fixed point in the right iliac fossa is suffering, almost invariably, from acute appendicitis and the case should be regarded as such until proved otherwise. Vomiting is variable, but nausea is common. Pyrexia is frequent but by no means invariable. Repeatedly, one is told that a case is not one of appendicitis because there is no rise in temperature or pulse; yet it is a common experience of all surgeons to remove the gangrenous appendix, often obstructive in type, from a patient whose temperature is 98.4 and pulse 70. A dry furred tongue is practically always present and is of real significance. Many cases have a characteristically sweetish smell in the breath which is a reliable indication of the urgent need for operation.

It should be unnecessary to mention the dangers of purgation, but the rule to avoid such purgation cannot be overstressed. The bursting of the obstructed appendix following such ill-advised treatment is frequently excused by the indifferent clinician on the grounds that purgatives have relieved many more cases of intestinal colic than have been hurtful in appendicitis cases. Purgation is a highly dangerous form of interference which cannot be condoned on any grounds.

*The Operation.*—A gridiron incision is almost routine. It can be immediately converted into a Rutherford Morrison muscle-cutting incision, should difficulty arise in delivery of the appendix and no harm results provided the divided muscles are approximated by suture on completion of the operation.

The decision to drain can never be reduced to a simple formula but it is frequently a wise precaution. It is more often advisable to drain the abdominal wall. Hamilton Bailey’s “Emergency Surgery” states that drainage is unnecessary in unperforated appendicitis, however evil the organ may look, but this rule should not be regarded as a hard and fast one.

A fit, middle-aged officer with a straightforward history had a paraæcal, gangrenous, but unperforated appendix removed and it appeared safe to drain the superficial wound only. His condition soon gave rise to anxiety with pyrexia, right basal pain and later, frank lobar pneumonia. He improved only when the wound started to discharge. A faecal fistula developed which
had to be closed intraperitoneally ten weeks later. The whole illness lasted four months and was presumably largely avoidable had the peritoneal cavity been drained.

The Post-operative Conduct of the Case.—There is a tendency to abandon the use of the Fowler position. This is not the place to go into the arguments for and against this time-honoured procedure, but there is no doubt that it is frequently unnecessary. If the patient can lie down comfortably, or turn on his side to sleep, post-operative progress may be more smooth and convalescence more rapid. The strain of the Fowler position has been well likened to the difficulty and discomfort of trying to sleep in an ordinary compartment on a night train journey. With gentle propping, knee pillows can be avoided, and this fruitful source of calf thrombosis obviated. Breathing exercises are instituted as early as possible and the patient encouraged to lift himself up in bed as soon as he is able. It is far better for the patient to go to the annexe in a wheel chair, supporting the wound with a hand over the dressing, than go through the gymnastic feats inseparable from the use of the bedpan. Early ambulation is encouraged.

The only grave complication in the series has been paralytic ileus. It is equally important to anticipate this complication whenever it is considered likely to ensue and institute treatment accordingly by continuous gastric suction and intravenous fluids. When syphoning suction does not work well, intermittent hourly emptying by syringe is equally effective. Should a suitable vein be available, insertion of the needle so that the forearm lies semiflexed in the mid-prone position adds greatly to post-operative comfort. This regime is continued up to seven days if necessary but can generally be terminated in thirty-six to seventy-two hours. If the drip is interrupted by accident or design, suction must be stopped otherwise rapid dehydration will ensue. Sedatives in the form of alopon are given as required. Radiant heat to the abdomen may be most helpful and comforting in severe cases. A small enema is given when bowel sounds have returned. Purgatives are forbidden. The treatment of ileus on these lines has been most gratifying in every case.

If toxæmia is severe, or peritonitis present, penicillin in 100,000 unit doses given eight-hourly at 0600, 1400 and 2200 hours, up to a million units, allows an eight-hour period of unbroken sleep. Sulphathiazole up to 25 grammes is frequently given simultaneously.

MECKEL'S DIVERTICULUM

There has been no case of primary diverticulitis, but one has been found on four occasions in three of which the presence of the diverticulum complicated the picture. In the first case, a perforated appendix was adherent to a diverticulum which formed part of the wall of an abscess cavity and had caused a partial volvulus of the ileus. The diverticulum was separated and removed. In the second, the tip of an inflamed appendix was connected to a fleshy solid "tumour" dependent from a diverticulum. The "tumour" after removal was reported to be an encapsulated mass of fibrous tissue. The diverticulum was removed. (Captain T. Menzies.)
The Acute Abdomen in Military Surgical Practice

In the third, the diverticulum, found to be attached to the ileal mesentery, was separated and removed. In a fourth case, a wide sessile process was found coincidently with appendicitis, and was not interfered with.

Case Histories

Some of the more interesting problems of the series are given in the form of short case histories.

A young soldier of a few days' service was admitted from the isolation hospital where he had been under observation for three days as a possible case of typhoid fever, and a perforated gangrenous appendix was removed. He was so ill that the wound was left unsutured except for the peritoneum which was closed round a drainage tube. For four weeks he remained desperately ill, twelve pints of blood being required to sustain him. Ileus was followed by subcutaneous abscesses over the trochanters and sacrum which had to be drained. A pelvic abscess was followed by a faecal fistula and jaundice, and by this time he was grossly emaciated. However, he gradually turned the corner to make a full recovery. The fistula was closed extraperitoneally. (Major H. Hall.)

A private soldier stated that he had undergone no less than five previous operations for appendicitis. At operation, a gangrenous retrocecal appendix was removed. (Captain J. Duncan.) One almost exactly similar case is included in the series.

In one case the tip of the appendix could not be delivered and was found to be wrapped up in omentum which passed upwards and inwards through a congenital defect in the ileal mesentery. The tip, which was adherent to the mesenteric vessels on the far side of the defect, was detached with difficulty and the gap closed. Post-operative ileus was followed by a short attack of diarrhoea which settled after a few days.

A soldier had been treated in the medical division for three days. On transfer to the surgical side, he was considered to be a case of peritonitis complicating appendicitis and treated on Oschner-Sherren lines. Five days later, a large appendicular pelvic abscess was opened, and two pints of pus sucked out. He never showed really satisfactory evidence of overcoming his infection. Toxemia was followed by bronchopneumonia, and in spite of every effort to rally him by transfusion his condition gradually deteriorated. On the tenth day after operation he developed severe melena and died the next day. At autopsy, there was severe plastic peritonitis with pockets of foul pus in the pelvis, mesentery, and under the diaphragm. The appendix was free but gangrenous and the ileum partly gangrenous. There was a perforation of the first part of the duodenum, presumably terminal, and a patchy bronchopneumonia. (Major H. Hanley.)

Two other cases of appendicular disease, not included in the series as they were not emergencies, were of interest.

A Sapper, a middle-aged obese man, giving no history of any attack resembling appendicitis had a palpable tumour in the right iliac fossa. The history was indefinite, the investigations inconclusive and laparotomy was
performed with carcinoma of the cæcum as the likely diagnosis. A very adherent mass was found involving the cæcum, which, while it was being assessed, burst, disclosing an appendicular abscess which was drained. The appendix was removed six weeks later. (Major E. Skinner.)

A Corporal, who was admitted to the Connaught Hospital from overseas with a diagnosis of tuberculous mesenteric adenitis, had a palpable tumour in the right iliac fossa which was tender and pitted slightly on pressure. The possibility of appendicitis was considered. An incision over the centre of the mass opened an abscess cavity which involved the muscles of the anterior abdominal wall with the distal half of the appendix lying in it. Appendectomy with removal of the abscess cavity was comparatively simple.

**Perforated Peptic Ulcer (Fourteen Cases)**

None of these cases was treated conservatively although it was clear at operation that at least four of them would have sealed off safely without operative interference. All were submitted to operation. One, a Guardsman, had been perforated for five days; another, an elderly Naafi employee of "50" years, for forty-eight hours, whose clinical note on admission to the hospital was "acute gastritis—treat for stomach." All fourteen cases did well.

**Acute Intestinal Obstruction (Eleven Cases)**

The causative factor in six was a previous operation for appendicitis, and the surgery required took the form of adhesion section. One previously operated had had an entero-anastomosis performed. Another showed a volvulus of the upper three feet of the jejunum from a strong band.

An Officer aged 48 was admitted with acute intestinal obstruction. Laparotomy disclosed an internal hernia into the pelvic mesocolon. The trapped coil was easily withdrawn and the defect closed. (Major H. Hall.)

A woman had had repeated obstructive attacks with central abdominal pain, vomiting, distension and visible peristalsis, dating from the replacement of a coil of intestine presented at the vulva following an induced abortion performed overseas. Eight laparotomies had been performed and at the ninth occasion a determined effort was made to sort out the adherent coils. As so often happens this was only of temporary value, and the peritoneal cavity has now become large obliterated. It has never been found possible to pass a Miller-Abbott tube successfully. However, she overcomes these attacks in a remarkable way and, as there is some evidence that the attacks are precipitated by premenstrual congestion, and as she has children, it has been decided to induce an artificial menopause by irradiation.

A Private aged 19 was admitted with acute obstruction. Laparotomy showed adhesion and kinking of the ileum by a burst tuberculous gland abscess in the mesentery. The abscess was mopped out and the gland removed. No further treatment was necessary to relieve the obstruction. There has been a second almost identical case. Both did well but convalescence was prolonged in the first by plasma jaundice.

During the past twenty months, five surgical cases have developed jaundice...
as a complication of plasma therapy. Fortunately they have all made a full recovery but jaundice has persisted for three months. The date of onset of the jaundice has been the same in all five cases, almost exactly ten weeks from the giving of the intravenous plasma. This complication made it necessary to issue a hospital instruction to the effect that, with the exception of severe burns or grave emergency, plasma should only be used after consultation with the officer i/c transfusion.

REGIONAL ILEITIS (CROHN’S DISEASE) (Three Cases)
A Boy aged 15 was admitted for renal investigation and three minute calculi were seen on cystoscopy. Three days after discharge he was readmitted with acute abdominal symptoms. At operation, the appendix was normal but the cæcum and terminal six inches of the ileum were red, thickened and velvety in appearance. Numerous fleshy mesenteric glands were enlarged. Three surgeons present considered the appearance to be strongly suggestive of Crohn’s disease but, as there was no evidence of stenosis or advanced change, no anastomosis or resection was performed. A second almost identical case occurred and, again, for the same reasons, no resection or anastomosis performed. Both cases made a full recovery but will be kept under observation. Unfortunately, histological proof is lacking in both. Both were operated on as cases of subacute appendicitis.

A Private aged 19 gave a three months’ history of central abdominal pain and constipation, but no vomiting. A week prior to admission the pain had become worse. On examination, there was a large palpable mass in the right side of the abdomen level with the umbilicus but not extending into the loin.

T. 99.2. P. 90. He was under investigation when his symptoms became acute and at laparotomy the mass was found to consist of grossly enlarged mesenteric glands in the centre of which was a breaking-down abscess cavity. The right colon and cæcum were involved in the inflammatory process and immediate right hemicolectomy was performed. The macroscopic and histological changes were those of Crohn’s disease. He did well. (Major M. Bennett-Jones—one of two cases reported in the British Journal of Surgery, July 1948.)

STRANGULATED HERNIA (Three Cases)
Two were inguinal, one umbilical. One of the inguinal cases was in a Polish soldier who had undergone an operation for radical cure in a Polish Hospital two months previously. Six inches of viable intestine were found tightly packed into a scrotal sac which showed no evidence of previous operative interference. Radical cure was performed.

INTUSSUSCEPTION (Two Cases)
The first was a straightforward infantile case. The second, a Private, aged 18, was admitted with abdominal colic and vomiting for thirty-six hours. Nothing had passed per rectum for seventy-two hours. Tenderness, with an indefinite mass, was found in the right iliac fossa. Laparotomy disclosed an ileo-colic intussusception, the apex of which had reached the hepatic flexure.
from its starting point two feet above the ileo-caecal valve. On reduction, 3 in. of the ileum looked black and of doubtful viability. Nine inches were resected and a side-to-side anastomosis performed. No cause could be found in spite of careful search. He did well. (Major H. M. Goldberg.)

BLEEDING PEPTIC ULCER (Two Cases)
Both these cases were operated on as emergencies.
A Serjeant aged 33 had been under treatment for ulcer for ten weeks in another hospital. He was transferred to the Cambridge for further treatment but developed severe haematemesis and melena. Blood transfusion failed to control the haemorrhage, his pulse started to rise steadily, and it was decided to operate. Laparotomy showed a large anterior duodenal ulcer which was excised with transverse suture of the duodenal wall. The right gastric leash was tied in continuity. He did well. (D. E. and Major F. F. Rundle.)

A Private aged 19 was also under treatment as an in-patient when he developed severe and uncontrollable haematemeses, and, as in the first case, it became apparent that the bleeding was continuing. Laparotomy showed a very large ulcer crater, close to the pylorus, to be eroding the pancreas. Gastrotomy was performed and an attempt made to obliterate the ulcer by five deep sutures from within. These controlled the bleeding but ten days later it recommenced. Partial gastrectomy was successfully performed under full blood cover. (D. E. and Major H. Hall.)

SUBPHRENIC ABSCESS
Rather surprisingly, there were only two cases. The first, an anterior abscess, complicated partial gastrectomy for chronic peptic ulcer. This case also developed a pelvic abscess, but subsequently made a good recovery. The second occurred as a complication of an infected hydatid cyst of the liver. The patient, an N.C.O., had been sent home from overseas following laparotomy for spontaneous intraperitoneal rupture. He developed a subhepatic abscess which was drained and found to contain a mass of dead cysts. He did well for a few weeks and then rapidly developed signs of a subphrenic abscess which was drained posteriorly after resection of part of the eleventh rib. He made a good recovery after a stormy convalescence and went to Switzerland under the auspices of the Swiss Red Cross. His anterior and posterior sinuses healed and he is back at duty in a low category, but his future is unpredictable. (Major M. Bennett-Jones.)

RUPTURE OF THE BLADDER (Two Cases)
Both cases complicated fracture of the pelvis. The first resulted from a fall from a window thirty feet from the ground. An extraperitoneal tear was successfully sutured. (Captain F. Robinson.)
The second showed gross fracturing of the pubic rami with inward displacement of a very large fragment of bone. He made a good recovery after suture of a large bladder tear with suprapubic drainage. (Captain Ian MacNab.)
INTERNAL HÆMORRHAGE (Four Cases)

A Cadet was admitted with severe abdominal pain and left-sided rigidity of a few hours' duration. The pain steadily increased in severity, and laparotomy was performed. A large quantity of heavily blood-stained fluid was sucked out but, in spite of careful search, no causative lesion could be found. There were petechial hæmorrhages in the pelvic mesocolon and the only reasonable explanation seemed to be a volvulus of the colon which had undergone spontaneous reduction. All subsequent laboratory and clinical tests were negative. (Major M. Bennett-Jones.)

A Private aged 19, a passenger in a lorry accident, was admitted in a state of shock with hæmaturia. Pain, vomiting, left-sided abdominal rigidity and tenderness were progressive. In view of the hæmaturia, it was decided to explore the loin first but only a small amount of perinephric blood clot was found. There was no gross tear of the renal cortex. This incision was closed and a left paramedian incision made. Hæmoperitoneum was present with rupture of an enlarged, adherent spleen which was removed. The pathologist reported evidence of past disease as shown by a moderate degree of "sugar coating" of the surface, but the cause of this was never substantiated. Full recovery. (Major M. Bennett-Jones.)

A Cadet was admitted in severe shock following a motor-cycle accident. After resuscitation, laparotomy showed gross hæmoperitoneum with the spleen torn in half. Splenectomy was followed by full recovery. (Major R. Lawrie.)

PERFORATING WOUND OF THE STOMACH

An N.C.O. stated that he was playing about with a large clasp knife when he slipped and sustained a perforating wound of the abdomen. The circumstances of the wound were never very clear. The peritoneal cavity was full of exudate, blood and stomach contents. There was a stab wound high up on the lesser curvature of the stomach. Suture was followed by full recovery. (Captain I. MacNab.)

ACUTE PANCREATITIS

A Private aged 19 was admitted with severe upper abdominal pain and vomiting. There was a history of operation on the gall-bladder at the age of 6 weeks, stated to have been performed at Great Ormond Street, but his name could not be traced in the records of that hospital. Laparotomy showed an effusion into the lesser sac with fat necrosis and acute hemorrhagic pancreatitis. The gall-bladder was surrounded by dense adhesions. He made a full recovery following the provision of drainage down to the pancreas. (Major H. M. Goldberg.)

TORSION OF THE OMENTUM

A Corporal was admitted with the signs and symptoms of an appendicular abscess and a firm diagnosis made. At operation the palpable mass was found to consist of twisted black omentum which was excised. (Captain F. Robinson.)
LYMPHANGIOMATOSIS OF THE ILEUM

Captain I. MacNab is recording this very remarkable case elsewhere. On a diagnosis of acute appendicitis, operation disclosed two feet of the ileum involved in the disease process, and short circuit, with exteriorization of the affected gut, was performed. Ten days later, the mass was excised by diathermy. Four weeks later, the resulting fistulæ were closed extraperitoneally.

OPERATION WITHOUT DEMONSTRABLE LESION

In fourteen cases, the diagnosis of appendicitis was made but operation failed to discover any disease process. Another was opened for a presumed perforation. All these cases had their appendices removed and their pain relieved. The basis for such relief is probably due to a temporary ileus following pneumoperitoneum combined with sufficient handling of the gut to terminate a simple colic.

The last case, an infant, showed anomalous signs and symptoms of intussusception. Bloody “apple jelly” was produced on the finger tip on rectal examination. At laparotomy through a rectus split incision no lesion was found.

The anaesthesia in the series was undertaken largely by Lt.-Col. W. H. Scriven, M.B.E., then Adviser in Anaesthesia to the Army, Major K. F. Stephens and Captain J. K. Sugden. The absence of serious chest complications testifies to their skill, and I am grateful to them for their help in the post-operative management of the cases, especially in respect of intravenous therapy.

CONCLUSION

This series of 430 consecutive cases of acute abdominal disease submitted to operation has been presented as a record of one aspect of the surgery carried out in a large military hospital in peacetime over a twenty-month period. It is gratifying to be able to record so low a mortality, two deaths in 430 cases. Certain of the cases are described in some detail and observations made on the clinical aspects of certain of the subgroups.

I am grateful to Colonel J. Crawford, Commanding Cambridge Military Hospital and to Lt.-Col. G. Anderton, O.B.E., Commanding Louise Margaret Military Hospital, for their permission to write about these cases, and to Brigadier D. Fettes, O.B.E., Director of Surgery, for his help and encouragement in preparing this paper.