value of drinking raw milk as a means of immunization, but merely mention it in order that we may dismiss it as a tragic form of immunization.

The Medical Research Council (1952) published the results of a national tuberculin survey which was undertaken in 1949-50, and, while no figures are given for those under 5, the figures for a rural area in the age groups indicated showed a tuberculin sensitivity rate as follows: 5-7 years, 26.5%; 8-11 years, 35.6%; 12-15 years, 50%. Compare these with our figures, which were also taken from a rural area but which are not unnaturally boosted up by this known source of infection. Hall (1950) did a similar survey on children in a village where there was a proved source of infection associated with a tuberculous gland; his results are shown in Table III. In this particular outbreak the

TABLE III.—Results in Hall's Survey

	Children Tested	Positive	Negative
Age 0-1	60	41 (68.3%)	19
1-4	7	1	6
5-15	15	12 (80%)	3
5-15	38	28 (74%)	10
% 1-15	53	40 (75%)	13

milk supplier had served the school as well as the village. In the Leicestershire survey the milk supply to the school was from an outside approved source.

As most of us in the tuberculosis service feel we are approaching the possible end of tuberculosis as a major problem in the community, it does seem more evident than ever that there is absolutely no justification for bovine tuberculosis playing such an important part in the incidence of tuberculosis. Not only may the bovine type cause a mortality of well over 1,000 a year in Great Britain, but it produces many crippling forms of tuberculosis. John Francis (1947) states that, according to the most reliable estimate, 20% of cattle in England are tuberculous, 7.5% in Wales, and 14% in Scotland. The incidence in dairy cows is probably 30 to 35%, but there is a great deal of variation in incidence in various parts of the country. It is lower in Wales, the North and South-west of England, and the North of Scotland. The Midlands of England are the most heavily infected. Furthermore, he states that complete healing of lung lesions is much less common in cattle than in man. He estimates that probably 0.5% of all cows in Great Britain have tuberculosis of the udder, and it is this type of tuberculosis which is the most important from the point of view of milk-borne infection. The result of infection in a small community by a single cow such as we have described emphasizes the need either for ensuring that the milk supply throughout the country must eventually come from accredited tuberculin-tested herds or for the general pasteurization of milk.

Conclusion

This survey demonstrates the following facts as well as the statistical data outlined.

(a) The importance of close liaison between the chest services and the local authorities in the prevention of tuberculosis. The chest physician can deal with a problem such as this only by obtaining the fullest assistance from the county medical officer and the staff of the county health department and the district medical officer of health.

(b) The desirability of a tuberculin test in all cases of glands of the neck. In our opinion this should become a routine: it is a very simple procedure, and any chest clinic would willingly undertake the necessary investigation. It must be borne in mind that only about 50% of cases of tuberculous adenitis are, in fact, bovine in origin. The tonsil is the recipient of the human bacillus

by inhalation and the tonsillar glands are subsequently involved. This fact was proved by the classical work of A. S. Griffith (1937, 1938).

(c) The high response of such a survey can be obtained only if the parents, general practitioners, and school authorities are all acquainted with the problem, and it is hoped that this article will show the willingness of both the local authority and the chest service to investigate any such similar outbreak and will again prove that the notification of a case of tuberculosis may have much wider ramifications than at first supposed.

We wish to acknowledge the help given to us by Dr. G. H. Gibson, County Medical Officer of Health for Leicestershire, Mr. S. A. Gregory, Chief County Sanitary Inspector, and all the other members of the County Health and Education Department who assisted us in making this survey as complete as possible. We also thank Dr. J. V. C. Braithwaite, Mr. T. M. J. d'Offay, and Mr. N. E. Kendall.

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DIAGNOSTIC DIFFICULTIES IN CONSERVATIVE TREATMENT OF PERFORATED ULCERS

BY

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It was only 60 years ago that Hastings Gilford treated a case of perforated peptic ulcer by operative closure—the first case so treated in this country. Since then this has become the accepted method and, until recently, the only method; but for some time a conservative regime has been advocated by a few authorities (notably Hermon Taylor, 1946, 1951).

The prerequisite of any form of treatment is accurate diagnosis, a problem which, in this matter, troubles us to-day almost as much as it did Mikulicz at the end of the last century. He indeed, before performing laparotomy, confirmed his diagnosis by puncturing the distended abdomen with a trocar.

Gastro-duodenal perforation causes the clinical syndrome of acute peritoneal irritation, hence the problem of accurate diagnosis consists first in eliminating the various extra- and intra-abdominal conditions which may simulate peritoneal irritation—for example, tabetic crisis, diaphragmatic pleurisy, coronary infarction, acute cholecystitis—and, second, in eliminating the other conditions which also cause peritoneal irritation.

If the treatment be conservative a misdiagnosis of one of the first group of conditions is not likely to be a tragic error, but a misdiagnosis of one of the second group may well be. On the other hand, if the treatment is to be operative a misdiagnosis of one of the first group will lead to an unnecessary and possibly dangerous procedure, whereas a misdiagnosis of one of the second group will automatically be corrected at operation.

Present Investigation

It is with the second group of conditions that this paper is concerned. Seventy consecutive cases of "widespread peritoneal irritation" are presented: "widespread" because the term "generalized" is regarded by many as synonymous with impending death, and "irritation" because that is a clinical term, and "peritonitis" is an inflammatory reaction generally, though not accurately, believed to be associated with infection.

The 70 cases fall into the following groups:

1. Gastro-duodenal perforations	34
Duodenal ulcer	22
Gastric ulcer	7
Stomal ulcer	1
Carcinoma	4
2. Appendicitis	17
Without abscess	13
Intraperitoneal rupture of abscess	4
3. Haemoperitoneum	9
Tubal pregnancy	4
Ruptured liver	2
Ruptured spleen	1
Ruptured left gastric artery	1
Ruptured ovarian cyst	1
4. Perforated small bowel	2
Jejunal diverticulum	1
Multiple chromaffinoma	1
5. Perforated large bowel	6
Spontaneous perforation of pelvic colon	1
Carcinoma of caecum	1
Carcinoma of descending colon	2
Diverticulitis of pelvic colon	1
Radionecrosis of pelvic colon	1
6. Lesions of female genital tract	2
Salpingitis	1
Intraperitoneal rupture of tubo-ovarian abscess	1

The purpose of this investigation is as follows. (1) An attempt is made to derive from a study of the clinical features of the gastro-duodenal perforations a "diagnostic screen," to be applied to all cases diagnosed as "acute peritoneal irritation." (2) The diagnostic screen is applied to those cases of "acute peritoneal irritation not of gastro-duodenal origin" which were pre-operatively considered as probably or possibly suffering from gastro-duodenal perforation. The persistent diagnostic error is noted. (3) The results of treatment of all cases by laparotomy are considered, to find out how many of those with gastro-duodenal perforations succumbed because of the operation, and how many of the other patients with peritoneal irritation survived when laparotomy was not delayed by a mistaken initial diagnosis. (4) In the light of these findings, the advisability or otherwise of the non-operative method of treating gastro-duodenal perforations is considered.

Main Features

The principal features of the cases of perforation were as follows:

Of the 34 cases, 27 were male. The average age was 49 years, with extremes of 17 and 73 years. The temperature averaged 98.1° F. (36.7° C.), ranging from 97° F. (36.1° C.) to 100.2° F. (37.9° C.); the pulse averaged 80 (48 to 120); and the respirations averaged 22 (18 to 40).

Previous Dyspepsia.—Twenty-nine cases had a previous history of dyspepsia. One case had had a previous perforation closed and a gastro-enterostomy performed. Four cases had had previous perforations with simple closure only.

Exacerbation of Symptoms immediately before Perforation occurred in 28 of the cases; there was increased dyspepsia for one to several days before the actual perforation occurred.

Sudden Onset.—All patients were able to state the exact time of onset—for example, "I had just laid down the newspaper, when suddenly . . ."

Time of Onset.—All but five cases occurred during waking hours.

Duration of Acute History.—The average time was five and a half hours, with extremes of one and fourteen hours; these times do not show the delay in "calling the doctor," but the delay from onset to examination in hospital.

Trauma.—In only one case was trauma present. This patient walked into the casualty department and stated that he "strained the abdominal muscle lifting a heavy weight and it has given way."

Easing of Pain.—In only seven cases had the pain eased off.

Site of the Pain.—In 18 cases the pain was indicated as epigastric, in 15 cases generalized, and in one case in the right hypochondrium.

Vomiting.—Eighteen of the patients had vomited, some excessively; 16 had not.

Bowels.—There were no cases of diarrhoea. Six cases had constipation, and 28 had normal bowel function.

General Condition.—Twenty-five cases were classed as "ill" or "very ill"; nine had a good general condition.

Tongue.—In 28 cases the tongue was dry.

Tenderness and Rigidity.—This was maximal in 33 cases.

Site of Tenderness and Rigidity.—Generalized in 19 cases, epigastric only in nine cases, right hypochondrium and right iliac fossa in three cases, epigastrium and right iliac fossa in one case, right iliac fossa only in one case, and right hypochondrium only in one case.

Liver Dullness.—This was lost in 15 cases, impaired in 10, and normal in nine.

Bowel Sounds.—These were present in 21 cases and absent in 13.

Evidence of Other Acute Disease was absent in all cases.

From these findings the following points might be considered as being those in whose absence nothing more than a tentative diagnosis of gastro-duodenal perforation should be postulated: male patients only; temperature, pulse, and respiration not far from normal; previous history of dyspepsia; recent exacerbation of dyspeptic symptoms; sudden onset; onset during waking hours; duration of less than 12 hours; no history of trauma; epigastric or generalized pain; no history of diarrhoea; dry tongue; maximal tenderness and rigidity; generalized, epigastric, or right-sided tenderness; no evidence of other disease.

The value of many of these clinical features is well known. Strang and Spencer (1950) found that more than 90% of their cases gave a history of dyspepsia and over 70% had an exacerbation of symptoms immediately before the perforation. Jamieson (1947) found that in his series of cases perforation at night was rare. He further reports that "severe exertion plays little part in precipitating perforations."

The longest acute history of this series was fourteen hours. Cases of much longer duration have been reported. Beattie (1951) describes four cases with an acute history of over 20 hours, but it seems that since the National Health Service, with the financial anxiety of illness removed, patients call their doctor far more readily.

X-ray diagnosis has not been considered in this series, as in many instances it was not available, and often the patient had too much pain to co-operate sufficiently if it had been available. Stead (1951) discusses the difficulties encountered in x-raying patients before reaching a diagnosis. He demonstrated free gas in 38 out of 47 cases, and in 10 cases treated conservatively radiography was either not available or failed to demonstrate gas.

In diagnosing the cases of "acute peritoneal irritation not of gastro-duodenal origin" nine of them closely resembled gastro-duodenal perforations. These case histories are summarized below.

Case Histories

Case 31.—Male aged 15. No previous dyspepsia; sudden onset of epigastric pain, persisting for 12 hours. No vomiting; constipated. Examination: General condition very ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 100° F. (37.8° C.), 100, 25. Diagnosis: Widespread peritonitis due to a perforated appendix, the caecum being completely undescended and in the midline. Differential diagnosis: Distinguished from gastro-duodenal perforation by absence of dyspepsia.

Case 33.—Male aged 56. No previous dyspepsia, but abdominal discomfort for seven days, followed by sudden severe generalized abdominal pain, persistent for 48 hours.

No vomiting; normal bowel function. Examination: General condition—very ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 97.6° F. (36.4° C.), 120, 24. Diagnosis: Intra-peritoneal rupture of appendix abscess causing widespread peritonitis. Differential diagnosis: Distinguished from gastro-duodenal perforation by absence of dyspepsia; a duration of acute history of 48 hours.

Case 38.—Female aged 38. No previous dyspepsia. Sudden onset of generalized abdominal pain while pushing a garden roller. Pain had persisted for 48 hours. No vomiting; normal bowel function; no upset of menstruation. Examination: General condition—good, but slight pallor. Tongue moist. Abdomen tender and rigid all over; normal bowel sounds; normal liver dullness. P.R. and P.V.: No abnormality. T., P., R.: 98° F. (36.7° C.), 100, 20. Diagnosis: Haemoperitoneum due to ruptured tubal pregnancy. Differential diagnosis: Differentiated from gastro-duodenal perforation by sex, no previous dyspepsia, duration of acute history, trauma.

Case 44.—Female aged 36. No previous dyspepsia. Sudden onset of generalized abdominal pain when her husband and she fell and he landed on her abdomen. Pain had persisted for four hours. No vomiting; normal bowel history; normal menstrual history. Examination: General condition—ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; normal bowel sounds. P.R. and P.V.: N.A.D. T., P., R.: 99.7° F. (37.6° C.), 94, 30. Diagnosis: Intra-peritoneal rupture of serous ovarian cyst. Differential diagnosis: Distinguished from gastro-duodenal perforation by sex, no previous dyspepsia, trauma.

Case 41.—Male aged 21. Previous dyspeptic history suggestive of chronic duodenal ulcer. Slight abdominal pain for 24 hours following a kick while playing football. Sudden onset of severe epigastric pain after this, persistent for 12 hours. No vomiting; bowels constipated. Examination: General condition—ill. Tongue dry. Abdomen tender and rigid in upper part; liver dullness normal; absent bowel sounds; slight abdominal distension. P.R.: N.A.D. T., P., R.: 100° F. (37.8° C.), 110, 20. Diagnosis: Haemoperitoneum due to rupture of liver (lacerated concave surface). Differential diagnosis: Distinguished from gastro-duodenal perforation only by the presence of trauma.

Case 45.—Female aged 48. Several attacks of epigastric pain at intervals of about one month or more, each lasting several days and then subsiding. She had suffered from this form of dyspepsia for several years. Sudden onset of epigastric pain, persistent for 12 hours. No vomiting; normal bowel function. Examination: General condition—ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; normal bowel sounds. P.R. and P.V.: N.A.D. T., P., R.: 98.4° F. (36.9° C.), 88, 24. Diagnosis: Widespread peritonitis due to perforated jejunal diverticulum situated 2 ft. (60 cm.) from duodenal-jejunal junction. Differential diagnosis: Differentiated from gastro-duodenal perforation only by sex.

Case 67.—Male aged 57. Indigestion for four months—epigastric pain and vomiting. For seven days symptoms much worse and accompanied by sensation of food sticking at lower part of chest. Sudden onset of generalized abdominal pain eight hours before admission; persistent. Vomited since onset. Bowels constipated. Examination: General condition—ill, with marked weight loss. Tongue dry. Abdomen tender and rigid all over; no mass palpable; diminished liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 99.8° F. (37.7° C.), 120, 24. Diagnosis: (1) Widespread peritonitis from perforated appendicitis. (2) Carcinoma of cardia of stomach. Differential diagnosis: Indistinguishable from perforated peptic ulcer.

Case 68.—Male aged 51. Partial gastrectomy 15 months previously for peptic ulcer. Recurrent attacks of epigastric pain for three months. Sudden onset of severe generalized abdominal pain three hours before admission; persistent. Vomited since onset. No bowel upset. Examination: General condition—ill. Tongue dry. Abdomen tender and

rigid all over; no mass palpable; no loss of liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 100.2° F. (37.9° C.), 106, 18. Diagnosis: Peritonitis due to perforated carcinoma of descending colon. Differential diagnosis: Indistinguishable from perforated stomal ulcer.

Case 69.—Male aged 75. Vomiting for about one month before admission; no previous abdominal pain. Recent loss of weight. Sudden onset of abdominal pain 12 hours before admission; pain persistent; vomited once. No bowel upset. Examination: General condition—very ill; marked weight loss. Tongue dry. Abdomen tender and rigid all over; distended; no mass palpable; loss of liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 100° F. (37.8° C.), 90, 20. Diagnosis: Widespread faecal peritonitis due to spontaneous perforation of the pelvic colon. Differential diagnosis: Indistinguishable from perforated peptic ulcer.

Comment on Above Cases.—It will be seen that, after rigidly applying the diagnostic screen already described, three cases remain that might easily be diagnosed wrongly as gastro-duodenal perforation (Cases 67, 68, and 69). Case 45 is distinguished only by sex, Case 41 only by the history of trauma, and Case 31 only by the absence of dyspepsia.

Results

Although this paper is primarily concerned with diagnosis, it is obvious that a diagnosis confirmed by laparotomy is worthless if the laparotomy adversely affects the patient's survival. On the other hand, a laparotomy delayed by a mistaken diagnosis in a case in which its necessity is urgent is equally undesirable.

The results in the cases of gastro-duodenal perforation and in those of acute peritoneal irritation from other causes are dealt with. Among the perforations there were no deaths attributable to the laparotomy, but three subsequent deaths were noted (see below).

With the following exceptions all cases made satisfactory recovery after simple closure of the perforation.

Case 18.—Male aged 70. Perforated pre-pyloric ulcer, immediate subtotal gastrectomy: section later proved to be non-malignant. Alive and well, having been followed for three years.

Case 21.—Male aged 54. Perforated carcinoma of the stomach: unfit for immediate gastrectomy; simple closure only. Laparotomy 14 days later revealed peritoneum full of metastases. He died four weeks later.

Case 22.—Female aged 50. Perforated carcinoma of the stomach infiltrating transverse mesocolon; immediate subtotal gastrectomy and transverse colectomy. Died at home suddenly three months after her discharge from hospital (? cerebral thrombosis).

Case 23.—Female aged 29. Perforated carcinoma of stomach, immediate subtotal gastrectomy. Patient alive and well, having been followed up for 12 months.

Case 54.—Male aged 73. Perforated duodenal ulcer. Died on seventh post-operative day from myocardial degeneration and uraemia (300 mg. per 100 ml.) following a violent haematemesis on the fourth post-operative day.

Case 55.—Male aged 70. Perforated carcinoma of pyloric antrum (inoperable). Perforation closed and gastro-enterostomy performed. Alive and well, having been followed up for 6 months.

Among the other cases there were four deaths.

Case 42.—Male aged 79. Ruptured spleen. Died on the table from cardiac arrest.

Case 43.—Male aged 77. Ruptured left gastric artery. Died seven days later from purulent bronchopneumonia.

Case 46.—Male aged 60. Multiple chromaffinoma of small bowel (perforated). Died from leaking anastomosis at the suture where enterectomy had been performed.

Case 47.—Male aged 73. Inoperable perforated carcinoma of caecum. Died five days later from peritonitis, drainage only having been done.

Discussion

Comment on this investigation is centred on four points. (1) Despite careful screening of 36 cases of acute peritoneal irritation from non-gastro-duodenal causes, three remain indistinguishable from gastro-duodenal perforations. In this series, which is too small to be statistically significant, for every 11 true perforations there occurred one case requiring immediate laparotomy, the clinical features being exactly similar to those of a perforated peptic ulcer. Therefore the conservative method of treatment applied to this series would have suffered from a 10% diagnostic error despite rigid selection, and a correspondingly greater error with rigid selection.

(2) It must be considered that the results by the non-operative method may be so vastly superior to those by the operative method that this small diagnostic risk should be accepted. This is not so. Hermon Taylor (1951), Stead (1951), and Beattie (1951) all quote at least one death in their respective series which would not have occurred under operative approach. There were no deaths among the small series of perforations reported here that were attributable to the laparotomy.

(3) The "poor risk case" must be considered. The above authors all report a satisfactory outcome to such cases, which would almost certainly have been fatal if subjected to laparotomy. Here they are on very firm ground in accepting the small risk of a mistaken diagnosis in a patient whose clinical features are typical of gastro-duodenal perforation, but who is a poor risk for laparotomy.

(4) The results of the cases of non-gastro-duodenal origin show that the fatality rate is nowadays small when laparotomy is not unnecessarily delayed. It is wrong to assume that a case will benefit by the delay which results from the mistaken application of the conservative measures for perforations, although some pre-operative treatment is often desirable in these cases. It is also wrong to assume that a patient with perforation of the large bowel would have died in any case.

The final conclusion must be that when a case is diagnosed as a gastro-duodenal perforation it should be treated by laparotomy unless the risk of the operation is thought to be greater than the risk of a mistaken diagnosis.

Summary

Seventy cases of acute peritoneal irritation are presented.

The clinical features of perforated gastro-duodenal lesions are evaluated, and a "diagnostic screen" is described.

The case of peritoneal irritation from all causes are tabulated, and details are given of those non-gastro-duodenal cases in which differential diagnosis was a problem.

The results of treatment are given.

It is suggested that laparotomy be performed on all cases diagnosed as gastro-duodenal perforation if the patient is fit for the operation, and the conservative method be reserved for those cases in which laparotomy would be a serious ordeal.

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Medical Memoranda

Weber-Christian Disease: Relapsing Febrile Nodular Non-Suppurative Panniculitis

Panniculitis by definition means inflammation of adipose tissue. Parkes Weber (1925) reported one case in which this happened in various areas of the body and caused pain and discoloured swellings of the skin. He examined a nodule microscopically, and reported his case under the heading of "Phagocytosis of subcutaneous fat cells by macrophages." There was no enlargement of the lymph nodes. Christian (1928) reported a similar case in greater detail, adding that fever also occurred. No organisms were found in either case. Despite intensive investigations no cause was discovered for this condition. Alice Carleton (1949) added a further example of this interesting disease to the fifty or so cases in the literature. A further case is now reported, showing the characteristic lesions, relapses, and histopathology.

CASE REPORT

A married woman aged 65 was admitted to hospital as a case of coronary artery thrombosis. A history of breathlessness on exertion, choking sensation, and swelling of the ankles was given, which had been intermittently present in the previous six years. An electrocardiogram revealed no definite myocardial infarction. Concurrently, the patient stated that she had been troubled with small painful swellings of the legs. These became red, did not break down, and after three weeks disappeared. These swellings had appeared in both legs and in both arms. The pain had been severe enough to cause loss of sleep. At the time of admission several such swellings were present, one of which, at the region of the right elbow, was removed for histopathological examination. The swellings recurred at irregular intervals, affecting the legs and arms indiscriminately. After recovery from particularly large and painful swellings a dimple resulted in the skin (see illustration).

The patient has been seen over a period of 18 months, and in that time has had several recurrences of nodules. On May 19, 1952, she was again examined and a large crop of lesions was seen, affecting both lower legs, three smaller lesions being present in the left forearm, and one on the palmar aspect of the right wrist. The lesions were variable in size, some were visible as purplish-red areas which on palpation could be identified as discrete nodules. Others