THE TREATMENT OF TUBERCULOUS PERITONITIS IN ADULTS—A RECORD OF 31 CASES

By F. M. CAIRD, F.R.C.S.,
Regius Professor of Clinical Surgery, University of Edinburgh

Tuberculous peritonitis is familiar to us as a disease of childhood and infancy. It is rarer in adult life. Thus in the years from March 1900 to the end of 1910, of 6366 adults admitted to the general surgical wards under my charge in the Edinburgh Royal Infirmary we only met with 31 cases of tuberculous peritonitis in patients between thirteen and sixty years of age. We propose discussing and tabulating these cases, presuming that in every instance definite evidence of the nature of the lesion was established. We exclude tabes mesenterica, tuberculous stricture of the intestine, and early examples of tuberculous appendicitis; we include cases showing general invasion of the serous surfaces as the main feature, as also a few in which the Fallopian tubes or ovaries were, in addition, markedly affected, and those in which a general peritoneal tuberculous infiltration seemed to have penetrated from the serous to the deeper layers of the intestinal wall.

The symptoms of tuberculous peritonitis are fairly uniform and well recognised. They are most pronounced in the exudative varieties. The patient complains of swelling of the abdomen, progressive, sometimes slightly intermittent. There is abdominal discomfort and even pain, loss of strength and weight. Constipation is the rule. As distension increases, nausea, vomiting, frequency of micturition and scanty urine appear, respiration and pulse-rate quicken, while temperature shows but little rise, if any. On palpation localised resistant areas and tenderness may be discovered if there be adhesions and infiltrated omentum. The dry varieties exhibit the characteristic "doughy" feeling, and are still more likely to be associated with local tenderness and resistance. When diarrhea occurs it suggests implication or kinking of the intestine.

The history may assist in diagnosis, as evidenced by the presence of enlarged cervical or axillary lymphatic glands, a tuberculous lung apex, the recollection of a former pleuritic attack, and by information gained as to similar conditions in the immediate relatives. Trauma plays a rôle in determining the local growth of tubercle in joints and other localities, but
it does not figure as calling forth tuberculous peritonitis. Two patients, however, stated that they had sustained a previous abdominal strain. In two women the condition followed closely upon the last confinement. In one case where a patient had made an excellent recovery after operation for gastric carcinoma (pyloro-gastrectomy), and in another more recent instance after ruptured gastric ulcer, both returned suffering from tuberculous peritonitis; yet in neither of them was there any indication of tubercle seen at the previous laparotomy. The characters of the fluid removed at a preliminary tapping, and the microscopic results attained after centrifuging may clear up a diagnosis by the presence of characteristic cells, etc., in carcinoma and tubercle and their absence in ascites. Rarely does cirrhosis of the liver remain hidden, but we have met with one case in which the rapid onset of ascites (without definite liver symptoms) and the presence of von Pirquet's reaction led one to an error in diagnosis.

Sex Incidence.—There were thirteen males from 17 to 60 years of age, averaging 32 years, and eighteen females from 13 to 51, averaging 22 years.

In few cases did the diagnosis present any difficulty, although it must be admitted that some of the more elderly were mistaken for examples of malignant peritonitis, and it is still more instructive that the disclosures in laparotomy so closely resembled diffused carcinoma in every respect that it was only the microscopic examination of portions of parietal peritoneum and nodules that demonstrated the true nature of the pathological process. Naturally the after-history was also corroborative. The findings in abdominal section differ in degree, and consist of a series of types which run into one another, but which may be roughly grouped as follows:

I. Cases in which fluid predominates—the ordinary exudative form.

II. The same, plus adhesions, the exudate sometimes encysted.

III. Dry forms without fluid, with or without adhesions.

IV. Dry forms in which the peritoneal cavity is practically obliterated or tubercle has invaded the bowel coat, passing from the serosa.

The majority of our patients had already been treated in the medical department without much benefit, and so were referred to the surgical side by the physician. Surgical treatment consisted in an exploratory mesial incision midway between the umbilicus and the symphysis pubis, or, as occasion seemed to
demand, in the linea semilunaris or appendicular region. An attempt was made to find and remove any prominent focus, but no laboured or prolonged search was ever regarded as advisable, and on few occasions were tuberculous tubes and ovaries removed or masses of infiltrated omentum. In such cases, or when the exudate was distinctly purulent, drainage was adopted for a short period. As a rule the abdomen was at once closed after evacuating the fluid and freeing such adhesions as could readily be separated. The dry and adhesive form called for operation on account of localised tenderness and the persistence of general symptoms. It was frequently encountered where one expected to meet with an encysted collection of fluid. Manipulative care had to be exercised on incising the thickened peritoneum, which was frequently almost inseparably blended with adherent intestine. In one patient despite special vigilance the bladder was opened. It lay 1½ inches above the pubes and was fused with the peritoneum. In three other cases the separation of adhesions between coils of intestine—the serosa of which was infiltrated with tuberculous nodules—necessitated a double enterectomy in order to remove large portions of friable gut. These cases made a perfect recovery despite the adverse conditions. Faecal fistula followed simple exploration in two of the purulent cases; one recovered, the other died at home.

Immediate Results of Operation.—Twenty-eight cases recovered. There were three deaths, all amongst the exudative type. Of thirteen males one died—one M. H., No. 30, æt. 18, an emaciated youth, ill for eighteen months, had a huge hour-glass abscess of the lower part of the abdomen and pouch of Douglas, which contained gas and faces. Drainage and later enterectomies were required, and he sank in four months from general tuberculosis. Two females died—A. B., No. 28, æt. 29, sank on the sixteenth day after operation from general tuberculous peritonitis, tubercle of lung, liver, and spleen; and M. E., No. 23, æt. 17, nineteen days after operation, from general lymphadenitis and peritonitis.

The dry forms, not generally regarded as favourable to surgical interference, all recovered.

It is noteworthy that with the exception of the above fatalities and a couple of patients in whom healing was not followed by marked relief all the others received benefit from operation.

Remote Results.—As may be anticipated it is no easy matter to follow up the after-history nor yet to ascertain the precise cause of death when that has eventually ensued.
Ten of the twenty-eight patients who left hospital healed cannot be traced. Nine died at varying periods; eight are known to be alive and well—one two years after operation, one three years, one four years, four five years, one nine years.

It is mainly by the ultimate result that the value of treatment is to be gauged, and even if our ultimate results are not brilliant they more than warrant the procedure. We have to bear in mind that the general state of patients suffering from tuberculous peritonitis is below par; their powers of nutrition and resistance are low, and the subjects referred by the physician for surgical aid have not greatly profited by previous treatment. Hence the mortality is, all things considered, far from excessive. We would not advocate with König that every case of tuberculous peritonitis should be under surgical care, nor yet can we admit with Borch-grevink that no such case should quit the physician's hands. It is only when medical means fail or appear to be of doubtful utility that surgical intervention is required. It would, however, be advantageous to know precisely what success attends the physician in his treatment of a series of cases in the adult. We confess, and are perhaps to blame, that we did not adopt tuberculin or other than general hygienic measures—adjuvants during or after hospital care.

It is doubtful to what extent the dry varieties of tuberculous peritonitis may be regarded as stages in the cure of exudative forms, since we have only met with one instance where there had been a preceding exudate.

The curative effect of laparotomy has been ascribed to various factors. The removal of a passive injurious effusion, thus relieving the general tension, the favouring influence of the succeeding hyperemia, the outpouring of an active anti-bactericidal fluid, each or all may play its part. That cell proliferation is encouraged appears evident, and amongst other observations one may recall that of Bumm, who had observed the microscopical appearance and the number of bacilli in the tubercles at a certain laparotomy. He had occasion to reopen the abdomen shortly afterwards, and in the tubercles then removed for examination an invasion by lymphoid cells was observed and disappearance of the bacilli.

The following table illustrates the salient features and history of the individual cases:
| No. | Patient | Age | Admission | Previous History | Present History | Operation | Condition found at Operation | Immediate Result | After-History |
|-----|---------|-----|-----------|-----------------|----------------|-----------|-------------------------------|-----------------|--------------|
| 1.  | H. C.   | 22  | 23/2/01   | Influenza, November 1899, Pneumonia and pleurisy left lung 1900. | 10 weeks, Abdominal pain, Increasing distension and tenderness. Flanks, suprapubic regions dull. Resistant mass left hypochondrium. | 9/3/01 Drained. | Much clear yellow fluid, Adhesions, tubercles and nodules "like a gravel pit." | Wound granulating. | Fecal fistula formed June 1901. |
| 2.  | R. H.   | 37  | 16/10/01  | Pleurisy 4 months ago. | 10 weeks, Swelling of abdomen; vomiting; discomfort. Flanks dull. | 18/10/11 Closed. | Much clear brownish fluid, Peritoneal tubercles. | healed. | not traced. |
| 3.  | Miss M. B. | 19  | 3/9/02    | No record. | No record. | 4/2/02 Closed. | Failed to enter peritoneal cavity. Dense adhesions. Bladder opened. | healed. | not traced. |
| 4.  | R. W.   | 21  | 15/4/03   | No record. | No record. | 28/4/03 Closed. | No fluid. Dense adhesions, and tuberculous omentum and nodules. | healed. | not traced. |
| 5.  | Miss C. H. | 18  | 17/4/03   | Enteric fever 1902. Frequent diarrhea. | 4 weeks, Abdominal pain. Increasing abdominal swelling. | 17/4/03 Drained. | About 3 quarts clear yellow fluid. Much matting of intestines. Both tubes friable. Removed. | healed. | excellent health. |
| 6.  | Mrs. T. | 51  | 29/11/03  | Potts' disease 20 years ago. 17 years discharging sinus left breast, and 17 years chronic dyspepsia. Attacks of jaundice, alternating constipation and diarrhea last few years. Brother and husband died of plthysis. | 20 weeks. Increasing swelling of abdomen, pain, albuminuria, swelling of face, hands, and legs. | 1/12/03 Closed. | Much free fluid. Peritoneum studded with carcinoma-like nodules. Mass in right ovarian region. | healed, but not gaining strength. | deceased. |
| 7.  | J. McC. | 17  | 20/2/04   | Satisfactory. Occasional rheumatic pains. | 36 weeks. Weak; pain and swelling in right hypochondrial region, which shows a mobile rounded mass. | 26/2/04 Closed. | Extra-peritoneal swelling contained pus. Peritoneum covered with carcinoma-like nodules. | healed. | deceased. |
| 8.  | J. B.   | 60  | 16/5/04   | Bronchitis 4 years ago. | 20 weeks. Vomiting, pain, loss of weight, weakness, swelling in right hypochondrium. | 3/5/04 Closed. | Peritoneal tubercles and matting like malignant disease. | healed. | June 1865 has gained 1st.31bs. Very well 1907. 22/2/09 hepatic abscess, chronic bronchitis, cardiac failure. |
| No. | Patient. | Age | Admission. | Previous History. | Present History. | Operation. | Condition found at Operation. | Immediate Result. | After History. |
|-----|----------|-----|------------|-------------------|-------------------|-------------|-------------------------------|-------------------|---------------|
| 9   | Mrs. E. D. | 29  | 13/10/04  | T.B. glands neck and axilla as child. Recrudescence 6 years ago. Both apices dull. | 24 weeks ago. After last confinement progressive swelling of abdomen. Nausea. Flanks dull. | 19/10/04. Closed. | Much fluid. Caseating mesenteric glands. Tubercles on omentum. | Healed. | Very well 1/11/05. Not traced since. |
| 10  | Miss B. T. | 13  | 14/2/05   | Subject to coughs and colds. | 4 weeks. Progressive swelling of abdomen. Weakness, loss of weight. Nausea. | 18/2/05. Closed. | No fluid. Mass of adhesions. | Healed. | † 19/3/05. |
| 11  | Miss M. D. | 23  | 6/3/06    | Delicate as child. Weak back; running ear. Mother, brother, and sister died of phthisis. Right apex dull. | 16 weeks. Dull abdominal pain. Nausea. Increasing distension. | 9/3/06. Closed. | 2½ pints yellow fluid. Peritoneal tubercles, felted omentum, covered with tubercles. T.B. glands. | Healed. | Pleurisy 6 months after leaving hospital; since well. |
| 12  | J. M.     | 44  | 22/4/06   | No record. | 7 weeks. After strain of abdominal muscles. Pain and great distension. Edema of extremities. | 22/4/06. Closed. | Peritoneal tubercles and adhesions. Encysted fluid, pouch of Douglas. | Healed. | Quite well. |
| 13  | Miss A. P. | 29  | 3/10/06   | Removal of cecum, etc., in March; end-to-end suture for appendicitis tuberculosa. | 24 weeks. Loss of weight, weakness, bulging of scar, abdominal pain, and some diarrhea. | 9/10/03. Drained. | Peritoneal tubercles and adhesions. Encysted fluid, pouch of Douglas. | Healed. | † 15/3/07. |
| 14  | Miss L. P. | 36  | 6/11/06   | Good till 1904, then sickness and vomiting. Loss of weight. Gastro-pylorectomy for carcinoma 7/10/05. | 12 weeks ago. Vomiting and flatulence. | 7/11/06. Closed. | Adhesions. Parietal and visceral tubercles. Hyperemic zones covered with tubercles on jejunum and especially on lower end of ileum and cecum. Resection of lower end of ileum. Lateral anastomosis with transverse colon. | Healed. | Not traced. Last record undated, "Doing well." |
| 15  | W. S.     | 45  | 3/12/06   | Delicate child. Bronchitis. Influenza 8 years ago. Daughter died of phthisis. | 12 weeks. Abdominal pain, weakness, loss of weight, constipated, sometimes vomited. | 9/1/06. Closed. | No fluid; no adhesions. Villous and sessile tubercles near parietal and visceral peritoneum. Gritty feeling like carcinoma. | Healed. | † April 1906. |
| 16  | Mrs. D. S. | 26  | 9/2/07    | Pleurisy 10 years ago. 5 years ago erysipelas. | 12 weeks. Abdominal swelling and backache; 3 weeks vomiting; 2 days' hematemesis. Loss of weight. Tapped twice. | 13/2/07. Closed. | Turbid fluid, adhesions, tubercles. | Healed. | † July 1907. |
### Treatment of Tuberculous Peritonitis

| Patient | Age | Date | Diagnosis | Duration | Symptoms | Treatment | Outcome |
|---------|-----|------|-----------|----------|----------|-----------|---------|
| Mrs. A.A. | 23  | 8/2/07 | Bronchitis in childhood. One brother consumptive. | 30 weeks | After continence, loss of weight, nausea, abdominal swelling. Flanks dull. No tenderness. Friction both apices and bases. | Yes | 11/2/07. Closed. |
| Mrs. I.W. | 22  | 17/9/07 | No record. | 28 weeks | Swelling of abdomen, pain, vomiting, loss of weight and strength. | Yes | 21/9/07. Closed. |
| Miss M.A. | 19  | 16/11/07 | Indigestion several years. | One year. | Abdominal pain, swelling, and tenderness. Diarrhea, colic, loss of weight and strength. Umbilical deep resistance. Very neurotic. | Yes | 12/11/07. Closed. |
| T.S. | 37  | 13/11/07 | Good. | 14 weeks. | Umbilical pain, nausea, vomiting. A cystic swelling extends from abdominal internal ring along cord. | Yes | 19/11/07. Laid open; incision extended into abdomen; closed. |
| Miss M.T. | 13  | 17/12/07 | Gastric fever 4 years ago. Apical pleurisy 1 year ago. | 11 weeks. | Abdomen swollen, feverish, constipated, Distended abdomen dull below. | Yes | 20/12/09. Closed. |
| Miss M.Y. | 16  | 16/11/08 | Rheumatic shoulder and side last winter. One brother T.B. glands neck and axilla. | 3 years. | Progressive swelling of abdomen. Flanks and up to umbilicus dull. | Yes | 24/1/08. Closed. |
| Miss M.E. | 17  | 25/1/08 | Bloodlessness 4 years ago. | Several months ago. | Abdominal pain, diarrhea. Swelling of ankles and abdomen 14 days ago. Nodular masses felt. | Yes | 28/1/08. Closed. |
| Miss R.M. | 16  | 23/5/08 | No record. | No record. | | Yes | 25/5/08. Closed. |

### Notes
- A little free fluid. Visceral and peritoneal surface covered with tubercles.
- Small intestine matted, fixed posteriorly. Wall of small intestine irregularly infiltrated. No strictures.

### Outcomes
- Healed.
- Well.
- Off her head after operation.
- Died 17/3/08. Gradual exhaustion and oedema of extremities.
- No directo.
- Tapped since. General condition now good.
| No. | Patient | Age | Admission | Previous History | Present History | Operation | Condition found at Operation | Immediate Result | After-History |
|-----|---------|-----|-----------|------------------|----------------|-----------|-------------------------------|-----------------|--------------|
| 25  | S. H.   | 21  | 24/12/08  | Good.            | 4 weeks. Dull abdominal pain. Loss of weight. Tumid abdomen. Dull flanks. Mass in right iliac fossa. | 30/12/00. Closed. | Cecum and glands form a large confluent mass. Peritoneum covered with tubercles. | Healed.         | May 1909.    |
| 26  | J. C.   | 26  | 23/2/09   | Good.            | 28 weeks. Strain of abdominal wall. August 1908. Epigastric pain, tender abdomen. Resistant mass below umbilicus. | 28/2/09. Closed. | No fluid. Mattedomentum and intestines. Tubercles. | Healed.         | Good health. |
| 27  | Miss I. C. | 13  | 25/4/09   | Good.            | 16 months. Sometimes attacks simulating appendicitis. Palpable tender right iliac mass. | 28/4/09. Drained. | Adhesions. Intestinal serosa covered with miliary tubercle. Appendix not found. | Fecal fistula.   | Not traced.  |
| 28  | A. B.   | 20  | 27/5/09   | Good.            | 4 weeks. Sudden sharp pains in hepatic region. Slight jaundice. Loss of weight. Flanks dull. Abdomen tender. | 1/6/00. Closed. | Much clear serous fluid. Omentum (removed) infiltrated with tubercle. Tubercles all over intestine and on tip of appendix. | 17/4/09. Sectio. | T.B. peritonitis. Caseation of abdominal glands, more especially at ileo-cecal angle. Tubercle of lung, liver, and spleen. |
| 29  | A. C. L. | 20  | 29/10/09  | 3 years ago T.B. peritonitis. Exudate. 6 months in bed. Treated with Koch's new tuberculin. Recovered. | 4 days. Sudden umbilical pain. Vomiting. Doughy abdomen, rather tender below umbilicus. | 26/10/00. Drained. | Adhesions. Intestinal serosa infiltrated. Bowel soft and friable. Lacerated. Double enterectomy. | Healed.         | Good health. |
| 30  | M. H.   | 18  | 3/1/10    | Erysipelas 9 years ago. | 8 weeks. General swelling of abdomen, pain, tenderness. Diarrhoea. Vomiting. | 7/1/10. Drained. | Hour-class cavity leading into pouch of Douglas filled with fetid pus and gas. Exploration of cecal region. Fecal fistula. Enterectomies later. | 21/4/10. Sectio. | Tuberculosis. |
| 31  | Mrs. A. G. | 24  | 6/4/10    | Husband T.B.     | 7 days. Abdominal pain. | 7/4/10. Closed. | Fluid. Adhesions. Tubercles in intestine (appendix). | Healed.         | Well.        |