

impacted in the wall of the bladder, it is much safer to allow it to pass by natural methods. In the female calculi can readily be reached through the vault of the vagina, but the discussion of operative procedures is foreign to the purpose of this paper.

CONCLUSIONS

The value and applicability of the expectant method of treatment in small ureteral calculi have been demonstrated by the passage and recovery of calculi in thirty-one cases, as compared with fifteen in which operation has been deemed necessary.

By expectant treatment is meant the employment of known medical measures under careful medical supervision, with frequent analyses of the urine.

Such treatment is based on the data derived from a careful Roentgen-ray examination with a study of the symptoms and signs as shown by other methods of clinical examination.

The results obtained by this course of treatment show that in 50 per cent. of the cases of urinary lithiasis presenting marked symptoms natural forces are capable of expelling the calculus.

With the accurate knowledge obtainable by known clinical methods of diagnosis this procedure is not only rational and justified, but should be employed rather than resort to the dangers of ureterolithotomy.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. LEONARD AND GARCEAU

DR. H. H. YOUNG, Baltimore: I think that Dr. Leonard is entirely correct in taking a conservative view in regard to certain small calculi of the ureter. During the course of such conservative treatment I advise careful observation and the use of the cystoscope to note the action of the kidneys in order to be sure that the outflow of urine had not become blocked. It is also necessary to compare the size of the ureteral orifice with that of the calculus shown by the *x*-ray, and if it is manifest that the size of the orifice is too small for the passage of the calculus, the patient should not be subjected to the unnecessary delay entailed by Dr. Leonard's procedure. In preference to a long wait I suggest an attempt at some intravesical cystoscopic operation. Casper and others have caused the passage of a calculus by injecting glycerin or olive oil above it. I have tried that successfully in one case. It may be possible to dilate the ureter by the passage of catheters of increasing size. I have had two cases in which this has been done successfully. Calculi fastened at the lower end of the ureter may be teased out with a ureteral catheter. In one of my cases a calculus impacted in the lower end of the ureter was dislodged and emptied into the bladder with a little manipulation of a ureteral catheter. I have now under observation a case in which a very small calculus, located only half an inch above the orifice of the ureter, has been present for a long time and the passage of ureteral catheters even of a large size has not secured the passage of the calculus. In order to facilitate the passage of this calculus I have devised a little ureteral dilator, constructed much like a urethral dilator, with an external attachment, whereby it is possible to enlarge it after introducing it into the ureter. Having been passed above the site of the calculus it is gradually withdrawn, its dilated portion stretching the ureter. The spring of the instrument is strong and firm. I used it only a day or two ago and can not say whether the procedure has been successful. It would seem to be applicable in cases in which the lower orifice of the ureter is too small to allow the passage of calculus. I do not recommend a long persistence in this non-operative treatment; I have had six cases of calculi removed from the pelvic portion of the ureter in men by the extraperitoneal iliac operation without a single death and in all cases there has been primary union of the ureter and no leakage of urine through the wound. I have two cases in which the calculi have been removed through the bladder

by means of incision of the lower orifice and extraction through the bladder. It would seem, therefore, that the rational treatment is not to wait too long, especially if the patient is suffering. We must also keep in mind the possibility of injury to the structure of the kidney on the affected side. The intraureteral operation, if feasible, would seem to be a desirable thing to try. I have tried intrapelvic irrigations in several cases of pyelitis, but with very unsatisfactory results. In cases of hematuria I have found the intrapelvic injection of adrenalin of great value, and have now had three cases of persistent hematuria, one of ten years' duration, cured by the intrapelvic injection of adrenalin.

DR. C. S. LEONARD, Philadelphia: I purposely did not take up the operative side of ureteral calculus. I simply wanted to show the result of the expectant treatment in certain cases in contrast to certain other cases necessitating operation. I spoke of intraureteral operation being dangerous on account of the softness of the ureter. I have had the misfortune to see three cases in which an attempt to pass the ureteral catheter caused perforation into the peritoneum. In another case in which the stone had been forced to the wall of the bladder it finally ulcerated through the wall and escaped in that way. The measurement of the stone as compared with the orifice of the ureter as seen with the cystoscope seems to me rather a delicate matter, because we can not tell from the *x*-ray exactly what the size of the calculus is, nor can we see in the refracting cystoscope and through its magnifying lenses the exact size of the ureter. I think that Nature can dilate the orifice of the ureter with as little danger to the patient as the surgeon can with any instrument; and, although this instrument may be serviceable in many cases in which the stone becomes impacted I think it is safer to leave the matter to Nature when that is possible.

DR. EDGAR GARCEAU, Boston: I take the view that it is unwise to wait too long in cases of impacted calculus. There are so many things that may happen if a stone is left in the ureter that it seems to me unwise to court danger by waiting. Hydronephrosis may develop, infection may ensue, and a very serious condition result in the kidney above. Just how long one should wait is, of course, a question to be decided by the sizes and symptoms in each individual case.

THE ACUTE FORMS OF ABDOMINAL TUBERCULOSIS *

DANIEL N. EISENDRATH, A.B., M.D.

Professor of Surgery, College of Physicians and Surgeons; Attending Surgeon to Michael Reese and Cook County Hospitals
CHICAGO

There has been a general impression for many years in the minds of the profession that tuberculosis of the various abdominal structures was a disease which almost invariably began in a slow insidious manner.

The fact that the lesions caused by the tubercle bacillus are often accompanied by such acute symptoms as to simulate in every detail the well-recognized acute forms of disease of the various abdominal viscera is not as well known as it deserves to be.

The two structures which are most apt to be thus involved are the appendix and the peritoneum, and the present paper will be limited to these two. Mayo,¹ however, has called attention to such an acute onset in cases of tuberculosis of the Fallopian tube, and in a previous paper² I have emphasized the relative frequency with which a mixed gonococcus and tuberculous infection of the epididymis will be accompanied by very acute symptoms. My interest in the subject was reawakened by an experience during the summer of 1907.

* Read at the International Congress for Tuberculosis (Surgical Section), Washington, Oct. 2, 1908.

1. Mayo, W. J.: Tuberculosis in the Abdomen, *THE JOURNAL A. M. A.*, April 15, 1905.

2. Eisendrath: Chicago Med. Recorder, 1903.

KOCHER'S CASE

Patient.—A boy of 14, while traveling abroad and apparently enjoying the best of health, was taken suddenly ill.

Present Illness.—He began to have vague abdominal pains accompanied by persistently high temperature (to 105 F.) of a continuous type, with symptoms of marked prostration. On the third day there was tenderness over the right iliac region and a distinct mass to be palpated.

Diagnosis.—The diagnosis of acute appendicitis was made by the local physician and confirmed by Prof. Theodore Kocher of Berne, to whom I wish to express my thanks for permission to include the case in the present paper.

Operation.—The abdomen was opened by Professor Kocher on the fifth day of the illness and a large mass exposed in the ileocecal angle, which was at first thought to be an acutely inflamed appendix wrapped in omentum. Further examination showed, however, that this mass was composed of four or five greatly enlarged ileocecal lymph nodes, each about the size of a hazelnut. One of these nodes was excised and showed on section all the evidences of an acute inflammation, but contained, in addition, a number of recent caseous foci. The remainder of the larger nodes were excised and the appendix carefully examined. It showed only acute catarrhal changes, but was removed. Microscopic examination of the lymph nodes and appendix confirmed the diagnosis of tuberculosis. The appendix showed several typical submucous tubercles and the nodes showed all the characteristic evidences of tuberculous infection.

Postoperative History.—The boy made a slow recovery, the most marked symptoms of the convalescence being great weakness, emaciation and anemia. During the past year the boy has gained greatly in weight and strength and seems to have made a complete recovery.

Professor Kocher expressed the opinion that the appendix has unquestionably been the atrium of infection and that the case had been one of tuberculous appendicitis due to the ingestion of butter containing tubercle bacilli. This patient had not taken milk in any form for several years, so that infection from this source could be excluded.

After reflecting on this case and looking over my own records and the literature of the subject for similar cases, I have thought it desirable to direct attention to these cases of acute onset of tuberculous appendicitis and peritonitis.

There are but few statistics available as to the frequency of primary tuberculous infection of the appendix. Fenwick and Dodwell² found that the appendix was the only portion of the alimentary tract involved in seventeen of 2,000 autopsies on phthisical patients. Le-seur,³ in 144 examples of tuberculous appendicitis observed at autopsies of phthisical patients, found no other lesion than that of the appendix in twelve. The opinion is rapidly gaining ground that primary tuberculous infection of the alimentary tract is not as infrequent a condition as was formerly thought.

The chief sources of infection are the ingestion of milk, butter and cheese from tuberculous cows. The danger from the meat of cattle and hogs is much less than that from milk and its products. That milk can act as a carrier of infection is a fact so generally accepted that it will be unnecessary to dwell on it here. It is, however, a matter of the greatest importance to be awake to the fact that butter is as potent a mode of conveying tubercle bacilli from animals to man. This has recently been the subject of an investigation by the United States Department of Agriculture. The position of those who hold for infection by ingestion seems much fortified by the findings of E. C. Schroeder and W. E.

Cotton of the experiment station service in Washington.⁴ These authors consider that "a very large amount of butter infected with tubercle bacilli is daily consumed by our people," and that this food is an ideal environment for the preservation of this bacterium. After ninety days these germs show only a doubtful reduction of pathogenic virulence. They tend to separate themselves from the milk by rising with the cream or precipitating with the sediment. Consequently these are the parts of milk which are most intensely infected. Butter probably contains them in discernible numbers, "thirteen times for every ten times they are sufficiently numerous in milk to be detected." These workers further declare that from 15 per cent. to 30 per cent. of the cows from which our cities draw their milk supply are affected by tuberculosis; that about one-fourth of the samples of sediment taken from the cream separators of public creameries throughout the country show tubercle bacilli; and that the frequency with which these bacilli occur in the sediment from milk is a fair measure of their frequency in cream, from which butter is made. "Measure for measure, infected butter is a greater tubercular danger than infected milk." Furthermore, because of the shield offered by butter against the germicidal action of sunlight, it tends ideally for their preservation, and tests show that in the ordinary salted butter of commerce the Koch bacillus "may live and retain virulence practically four and a half months or longer."

In the majority of text-books brief reference is made to the fact that tuberculosis of the appendix and peritoneum may begin acutely. The case just described and the following ones to be reported certainly show that such an acute onset is a factor to be considered in the future when we are called on to diagnose the nature of an acute abdominal affection.

The French surgical journals have recently contained reports of some extremely instructive cases, of which I will first give a synopsis:

A. DEMOULIN'S CASE

The patient, a woman, aged 38, had her first attack of acute pain in the right iliac region in July, 1904. A second but more severe attack occurred in November, 1905. She was seen by Demoulin⁵ in January, 1906, during her third attack. There was great tenderness over McBurney's point and a hard mass to be felt. After subsidence of the acute symptoms operation on Feb. 15, 1906, revealed a mass of lymph nodes the size of a hen's egg in the ileocecal angle. Some of these were hard, others caseous. These nodes and the appendix were removed. The examination of the appendix was negative. The patient was well fourteen months after the operation.

The first French surgeon to call attention to the fact that a pericecal tuberculous adenitis can give rise to symptoms of acute appendicitis was Gerard-Marchant.⁶ He also emphasized the fact that a tuberculous appendicitis could exist without either microscopic or macroscopic evidence of its specific nature, the only evidence being the tuberculous ileocecal lymph nodes. This view of Gerard-Marchant has since been endorsed by other European surgeons, especially in France, and is in accordance with the experimental evidence furnished by Dobroklonsky⁷ in 1890. The latter showed conclusively that tubercle bacilli could pass through the healthy intestinal wall without any trace of their migration. This is analogous to what is observed in the tonsil.

4. Tubercle Bacilli in Butter, Rep. 127, Bureau of Animal Industry, Dept. Agric.

5. Bull. et mém. Soc. de chir. de Paris, May 15, 1907.

6. Bull. et mém. Soc. de chir. de Paris, Jan. 24, 1900.

7. Arch. de méd. exper. et d'anat. path., 1890, No. 2.

3. Brunner: Deutsch. Chir., xlv.

GERARD-MARCHANT'S CASE

A young Cuban had two classical attacks of what was diagnosed as acute appendicitis, with pain in the right iliac region, fever, vomiting and tympany. The fever and a tumor in the right iliac region persisted. At operation two caseous ileocecal nodes were found and these and the appendix were removed. The appendix showed no changes either to the naked eye or on microscopic examination.

LECENE'S CASE

In a case of Lecène (quoted by Petit⁸) there was a similar history, and three tuberculous nodes were found in the meso-appendix. The appendix showed submucous tubercles microscopically.

In all these cases the lymph nodes may be the principal lesion, although the appendix is the atrium of infection.

ROUTIER'S CASE

Routier⁹ reports a case in which the appendix was large, red and adherent and the nodes were large and tuberculous.

SIREDEY'S CASE

In Siredey's¹⁰ case a girl of 14 who had a tuberculous father had always enjoyed good health. She had frequent attacks of colicky pain in the right iliac region, the diagnosis of chronic appendicitis being made by Jalaguier. At operation a straw-colored fluid escaped. There were many miliary tubercles scattered over the peritoneum. The appendix was removed, but showed only the changes characteristic of a chronic appendicitis. A large lymph node removed from the mesoappendix contained caseous foci.

Tuffier¹¹ has recently reported a case of Guibal and one of his own which are quite typical:

GUIBAL'S CASE

In Guibal's case a previously healthy child of 6 began suddenly to have severe abdominal pain accompanied by marked right-sided rigidity and tenderness, fever to 103 F. and vomiting. Appendectomy was performed four weeks later during the interval. Ileocecal nodes, the size of a large nut, showing many caseous foci, were found and removed. The peritoneum and cecum were negative. The appendix showed no tuberculous changes.

TUFFIER'S CASE

In Tuffier's own case, a girl of 12 was operated on two months after a typical attack of acute appendicitis. The appendix showed a tuberculous folliculitis and there were several caseous ileocecal nodes, which were also removed.

A case similar to those just quoted occurred during the past summer in the Michael Reese Hospital service of my colleague, Dr. Louis A. Greensfelder, to whom I am indebted for permission to publish it:

GREENSFELDER'S CASE

Patient.—L. T., girl, aged 5, was admitted to the service of Dr. Greensfelder June 2, 1908. Her parents are both living and in good health. The patient is the only child; she is well nourished and had been apparently in the best of health prior to the onset of the present illness. She was taken ill suddenly the day preceding her admission with pains in the abdomen and left side of chest.

Examination.—This, on admission, showed a small area of consolidation in the upper lobe of the left lung. The abdomen was somewhat tympanitic, quite rigid and there was general tenderness on pressure, but this was more marked in the right iliac region.

Operation.—When the abdomen was opened a free straw-colored fluid escaped. The glands in the mesoappendix were greatly enlarged and caseous. The appendix was injected and

thickened. Appendectomy was performed and removal of glands. No microscopic examination of the appendix was made. The patient recovered and was discharged from the hospital July 19, 1908.

The following cases of acute tuberculous peritonitis occurred in my service:

EISENDRATH'S CASES

CASE 1.—Encapsulated (subphrenic) tuberculous peritonitis with very acute onset simulating ordinary subphrenic abscess.

Patient.—V. de S., male, aged 48, was admitted on Aug. 24, 1906, to the medical service of Dr. J. L. Miller in the Cook County Hospital with the diagnosis of pneumonia. On account of the patient's inability to speak English well, the only history obtainable was that he had been perfectly well up to nine days before admission, when he began to have pain in the abdomen which varied greatly in intensity and was most marked around the umbilicus.

First Examination and Diagnosis.—The leucocyte count was 8,600, the abdomen distended and the temperature ranged between 100 F. and 104 F. The condition remained unchanged for ten days. Owing to the fact that the rigidity and tenderness was most marked in the right hypochondrium, a diagnosis of acute cholecystitis was made, and the patient was transferred to the surgical service of Dr. Charles Heywood.

First Operation.—The latter opened the abdomen and found the appendix and gall bladder normal. There were, however, many dense adhesions between the coils of intestine and the omentum was adherent to the abdominal wall. After this operation the temperature rose still higher (to 104.4 F.) and there was accompanying stupor, delirium and rapid respirations (to 44).

Second Examination.—In the absence of Dr. Heywood, I saw the patient on Sept. 6, 1906. There was marked stupor. Dulness extended upward from the liver to the fourth rib in the mammary line to the fifth rib in the midaxillary line and seventh rib in the scapular line. There was an absence of respiratory sounds over this area. When an exploring needle was inserted through the eighth interspace a foul flaky fluid was obtained.

Second Operation.—I resected the eighth right rib in the scapular line and found the pleural cavity empty. The diaphragm was sutured to the parietal wound and about twelve ounces of a slightly turbid fluid evacuated from the subphrenic space.

Postoperative History.—The patient made a slow recovery, the subphrenic wound continuing to discharge for several weeks. About eight weeks later evidence of marked ascites appeared, and the patient died about six months later.

Autopsy.—This showed a typical tuberculous peritonitis with effusion. The subphrenic region showed firm adhesions over the previously involved area.

CASE 2.—*Patient.*—A. L. W., aged 26, clerk, had always enjoyed good health. Family history negative.

Present Illness.—This began suddenly in February, 1904, with pain in right iliac region, but no fever. A physician who saw him at the time made a diagnosis of appendicitis. When I first saw the patient in June, 1904, there were evidences of an encapsulated collection of fluid in the right iliac region.

Operation.—Laparotomy revealed a walled-off collection of thin yellowish pus occupying the right half of the abdomen. The posterior wall of this abscess cavity was formed by agglutinated coils of intestines covered with tubercles and granulation tissue which showed evidences of tuberculosis microscopically. The patient recovered completely.

CASE 3.—Acute onset of tuberculous peritonitis with high continuous fever resembling typhoid.

Patient.—A woman, aged 35, had been ill five weeks when I first saw her. The illness had begun suddenly with mild abdominal pains and other vague symptoms like a typhoid. Her fever had been of the continuous type and ranged between 101 and 104 F. She had been given the routine typhoid treatment.

Examination.—This showed evidences of fluid, and laparotomy revealed a very advanced ulcerative caseous peritonitis.

The patient died a few months later.

8. Dissertation de Paris, 1905.

9. Bull. et mém. Soc. de chir. de Paris, July 5, 1905.

10. Bull. et mém. Soc. de chir. de Paris, May 15, 1907.

11. Bull. et mém. Soc. de chir. de Paris, May 29, 1908.

An example of such an acute onset is shown in the recent report of a case by A. K. Stone:¹²

STONE'S CASE

Patient.—A woman, aged 22, whose mother had died of phthisis, was admitted to the Massachusetts General Hospital in February, 1907. Her illness had begun suddenly three days before admission with severe abdominal pain and vomiting. On the patient's admission the abdomen was found to contain free fluid, accompanied by rigidity and tenderness. The evidences of fluid disappeared under medical treatment.

Stone states that sudden onset is common in tuberculous peritonitis, being found in about one-quarter of all cases. The fluid both accumulates and disappears rapidly.

Osler refers briefly to the fact that tuberculous peritonitis may begin suddenly and be accompanied by continuous fever resembling that of typhoid fever. At present the absence of the Widal reaction, the leucopenia, and not infrequently the evidences of the presence of free fluid will serve to distinguish the process as a tuberculous one.

A case is reported by Michaux¹³ resembling my own of an acute onset of tuberculous peritonitis with symptoms pointing to a subphrenic abscess:

MICHAUX'S CASE

The onset was very sudden with great dyspnea, clinically resembling a pneumothorax. There was high temperature and edema over the right side of the abdomen and chest wall. An incision along the costal arch evacuated pus containing gas. There was temporary improvement as in my first case, but death occurred one month later. The autopsy showed a dry tuberculous peritonitis.

The most complete statistics on tuberculous appendicitis are those of Brunner³ based on fifty-one cases collected from the literature. It includes all published cases in which appendicectomy had been performed. To this number I can now add seven. Of these fifty-eight patients over one-fourth, that is, sixteen, had symptoms which in every detail resembled an attack of acute appendicitis. The direct operative mortality in this series of fifty-eight cases has been very small. It is almost impossible to state what the final results have been because so few of the cases have been followed for a sufficient length of time to speak of a complete recovery, and in many of the reports the patients suffered from tuberculous lesions elsewhere which ultimately resulted fatally.

If, however, in such cases as those of the French surgeons just quoted and Kocher's and Greensfelder's, the lesion is operated on early enough and the appendix and glands removed, the prognosis should be very favorable. That the appendix in many of the cases showed no tuberculous changes does not militate against such a specific infection. As stated above, the tubercle bacilli can pass through the walls of the appendix without leaving any trace of their passage. The bacilli can then infect the ileocecal lymph nodes or be the starting point of a tuberculous peritonitis.

CONCLUSIONS

My conclusions are the following:

1. A primary tuberculous appendicitis is not as rare an affection as was formerly thought.
2. Such an infection can be followed by secondary involvement of the ileocecal lymph nodes which is out of all proportion to the pathologic changes in the case.

3. In the majority of cases there are evidences of tuberculous foci in the appendix, but secondary lymph caseous nodes may be found without visible macroscopic or microscopic tuberculous changes.

4. Butter, milk and cheese from tuberculous cows are the chief sources of infection in primary intestinal tuberculosis.

5. In a fair proportion (27 per cent.) of the twenty-nine published cases of tuberculous appendicitis the clinical picture resembled an acute non-tuberculous appendicitis. No statistics are available to estimate the proportion of cases of tuberculous peritonitis which begin acutely, but it is larger than is usually thought.

6. Through early diagnosis and radical removal of the tuberculous appendix and infected lymph nodes (as far as practicable) complete and permanent recovery can occur. Some of the cases of ileocecal tuberculosis and of tuberculous peritonitis may thus be avoided through removal of the probable starting point.

103 State Street.

A METHOD FOR INCREASING THE DIAGNOSTIC VALUE OF SPUTUM REPORTS *

ARTHUR T. LAIRD, M.D.

ALBANY, N. Y.

The methods usually employed in recording the examination of a specimen of sputum give somewhat meager information regarding the character of the specimen submitted.

A more careful selection of the terms used in the description of the macroscopic appearance of the specimen and of the various elements found on microscopic examination would in many cases give valuable hints as to the character and source of the sputum examined.

Most text-books, under the heading "Macroscopic Appearance," follow Biermer's¹ classification of sputum as "mucoid, mucopurulent, purulent, and bloody." They usually describe also the subvarieties which he clearly distinguished but without giving them the definite names which he employed. For instance, many authors call attention to the fact that there are two types of mucopurulent sputum—one of which is homogeneous and the other not. Biermer reserves the name "mucopurulent" especially for the first type. It is homogeneous, tenacious, more or less opaque and usually yellow. It differs from strictly purulent sputum, which is liquid, in being tenacious. The second type, which he designates as "purulo-mucoid," is not homogeneous. The yellowish or whitish purulent matter forms lumps or flakes imbedded in more or less transparent, tenacious mucoid material. Klopstock and Kowarsky² use the same terms in describing these varieties.

Heyman³ has divided the moist droplets disseminated by coughing consumptives into three classes in accordance with their microscopic appearance: 1, Droplets of a type containing a central kernel of fibrin and leucocytes surrounded by epithelium and mucus; 2, containing a kernel rich in leucocytes with a scanty mucoid layer; 3, containing only epithelium and mucus.

* From the laboratory of the Adirondack Cottage Sanitarium, Trudeau, N. Y.

1. Biermer: *Die Lehre von Auswurfs*, Würzburg, 1855.

2. Klopstock and Kowarsky: *A Manual of Clinical Chemistry, Microscopy and Bacteriology*, translated by T. Wright, New York, The Rebman Company, 1905. See also Lawrason Brown: *Sputum Examination in Pulmonary Tuberculosis*, Montreal Med. Jour., October, 1901.

3. Heyman: *Ztsch. f. Hyg. u. Infektionskr.*, 1899, xxx, 139; xxxviii, 2. Ziesche: *Ztschr. f. Hyg. u. Infektionskr.*, 1907, lvi, 57.

12. Boston Med. and Surg. Jour., May 16, 1908.

13. Bull. et mém. Soc. de chir. de Paris, 1897.