

**SYMPOSIUM ON APPENDICITIS: PAPERS
PRESENTED AT THE MEETINGS OF THE
CUYAHOGA COUNTY
MEDICAL SOCIETY, IN CLEVELAND, ON
THE EVENINGS OF THE 4TH AND 18TH OF
OCTOBER, 1900**

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Symposium on appendicitis: papers presented at the meetings of the Cuyahoga County Medical Society, in Cleveland, on the evenings of the 4th and 18th of October, 1900 by Various

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Symposium on Appendicitis.

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ETIOLOGY OF APPENDICITIS.

BY GUY H. FITZGERALD, M. D.

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The predisposing causes of appendicitis are many. The organ is functionless so far as we know, and being rudimentary it is less resistant to infections and less able to repair damage when done. It is a closed tube with a common opening for the entrance and egress of foreign bodies and hence the drainage at times must be faulty. This is especially true when the organ hangs dependant or when bent or twisted upon itself. The blood supply through the appendicular artery may be partially or completely shut off by torsion or kinking of the organ and by twists of its mesentery. Pressure from tumors and embolism, too, may obstruct the circulation.

The large amount of lymphoid tissue in the appendix must prove an important factor. This tissue, similar in structure to that of the tonsil, has led some to assume that the appendix is subject to similar disorders and on this basis account for recurring attacks of the disease.

A preceding attack of some gastro-intestinal trouble is often a determining factor. A catarrhal process involving the mucosa of the caecum may reach the appendix by extension. Typhoid ulceration may occur in the glands of the appendix and tuberculosis may be present when the neighboring structures are affected or when the tubercular focus is in some distant organ. Pus tubes and pelvic disease in general may reach the appendix, especially when it extends down into the pelvis. Actinomycosis has been demonstrated as one of the causes of appendicitis. As predisposing, if not direct, causes of appendicitis dysentery, lead poisoning, influenza and rheumatism may be mentioned. The latter two diseases have been supposed to affect the lymphoid tissue in particular. The disease is most common between the ages of 15 and 30 and it is about twice as common in males as in females. Traumatism may be mentioned as one of the factors and a severe strain in lifting heavy loads, jolts, etc., are quite often assigned as a cause. Rare cases are those in which new growths, both benign

and malignant, hydatids, etc., occlude the lumen or interfere with the blood supply and thus cause the disease. Foreign bodies bear a minor part in appendicitis. Seeds of various kind, intestinal parasites, spicules of bone, and other foreign bodies may enter the lumen, act as irritants and become exciting causes of appendicitis, but this is an infrequent occurrence. Calculi are often found in the appendix. They may sometimes be forced in from the caecum, but more often they are found in the appendix. During a catarrhal inflammation of the mucosa an exudate is thrown off and this mixed with granular debris, desquamated cells has lime salts, cholesterine and other matter deposited upon it and thus a calculus is formed. The peristalsis of the organ in attempts to dislodge it moulds it into the form usually found. Once formed, a calculus may prove an important factor in further trouble. It may act as an irritant to the mucosa and by pressure lower its vitality so that the bacteria, already present, have a media favorable for growth.

As a sequel to ulceration of the mucosa there often results a stenosis due to the formation of scar tissue. This narrowed area may interfere with drainage of the organ and when it does so becomes an important factor. This is especially true when the contracted area is near the base or in the body of the organ. Healed ulcers on one side by contracting may start a kinking of the appendix and thus interfere with its free drainage. Anything which interferes with free drainage will predispose to if not cause appendicitis. When the tube is closed the bacteria present seem to assume a greater virulence. Kinks or twists due to a long or short mesentery, an appendix which hangs low in the pelvis or one which is bent up behind the colon so that the contents of the caecum may interfere by pressure are all important.

The bacillus coli communis is the most common organism in appendicitis. Associated with it may be a number of others, especially staphylococci and streptococci. Rarer organisms are the pyocyanous, prodigeosis, subtilis. The coli communis alone, however, may be found in those severe cases called "fulminating" appendicitis.

A study of 42 cases in the surgical service of Drs. Bunts and Lower shows the following facts which may have a bearing on the etiology: There were 26 males; 16 females. Average male age, 25.6; female, 21.5 years. The oldest patient was 66, the youngest 6, both females. In twenty-one cases a history of some preceding gastro-intestinal disturbance was elicited. Three patients had had rheumatic attacks during the preceding year. In

two cases the attack seemed to follow closely a mild form of influenza. Eight patients had had typhoid, but in none was it recent. In eighteen cases there was constipation and four had been troubled with diarrhoea. Two patients had received an injury which was followed promptly by appendicitis. A little girl of six had been kicked in the abdomen by a playmate and a woman 36 had fallen down a cellarway and landed on the corner of a box which struck her in the right iliac region. Three patients attributed the disease to heavy strains in lifting. In eight cases nothing could be adduced from the history which would have any bearing on the causation. Thirteen appendices were behind the colon and seventeen were in the pelvis. Of the latter, one was across the median line on the left side and was adherent to and ruptured into the bladder. In four cases there was a distinct kinking and fifteen specimens showed areas of stenosis. Two specimens were mere pus sacs. Thirteen cases had a short mesentery, while in twelve it was longer than usual. Tuberculosis was demonstrated in two cases, twice in appendices in contact with tuberculous tubes and once in a patient who had a tubercular process in the left apex. Calculi or concretions were found in twenty-seven specimens and one appendix contained a seed.

Inoculations were made from the peritoneal surface of the appendix in all cases. In some inoculations were made from the interior also. The inoculations from the peritoneal surface of those appendices which were not gangrenous or rupture were sterile. Of the pus cases, twenty-four in number, one proved sterile. This was an old case on its way to recovery. Twenty-three cases showed the presence of the bacillus coli communis. In six cases it was associated with staphylococci, five times with aureus and once with citreus; no streptococci were found. The most severe cases produced only coli when inoculated on agar.

DIAGNOSIS OF APPENDICITIS.

BY CHARLES B. PARKER, M. D.

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There are no pathognomonic signs of appendicitis, nor is the presence of any one sign alone sufficient to make a certain diagnosis. In most cases the diagnosis may be made upon the following symptoms being present:

1. Sudden onset in one previously well with or without vomiting.

2. "Board-like" condition of the right abdominal wall.
3. Pain at the McBurney point.

First. The sudden onset in one previously well is characteristic of appendicitis.

This sudden onset in one perfectly well is most marked in first attacks, but is also present (its suddenness is marked) in many cases of recurring appendicitis. It is an important differential sign as we shall see further on.

Second. The board-like condition of the abdomen. This is present and localized on the right side, or it may extend over the entire abdomen in severe fulminating cases. It is to be distinguished from a tumor or other condition within the abdomen. It appears early, before any tumor has formed, and it persists. It cannot easily be mistaken, and its absence casts doubt upon the presence of any inflammation of the vermiform appendix.

Third. Pain. While pain varies greatly in degree in various subjects, it is usually present. The patient is not always able to locate the pain in the appendicular region in the beginning of the attack, but in the great majority of cases the pain is accentuated at the McBurney point.* Sooner or later the fleeting pains felt at various parts of the abdomen become centered at this point. Exceptions certainly do occur. I recall the case of a patient where the pain continued acute in the region of the gall bladder and was never marked in the appendiceal area except upon pressure. I recall the case also of a physician who never clearly located the pain in his right groin though he had repeated recurrent attacks. Pain may also be accentuated by palpation.

The amount of tenderness usually corresponds in some measure to the degree of inflammation. If the tenderness is markedly increased it may indicate the formation of pus, or even the beginning of gangrene. Again, where the tenderness is markedly increased with symptoms of collapse and vomiting, it may indicate perforation and general peritonitis. Whenever the tenderness is decreased during the course of an attack, it may be due to the discharge of a concretion from the appendix, or it may be caused by the free evacuation of the bowels, or, again, it may indicate the most complete and extensive sepsis. The cessation of pain, therefore, is by no means a favorable symptom, and when it occurs with other evidences of blood poisoning, it should be regarded as a most unfavorable diagnostic sign. When the cessation of pain is

*A point midway of a line drawn from the umbilicus to the right anterior superior iliac.

complete and abrupt, it indicates extensive gangrene of the appendix. When the pain occurs at other than the typical point, it is due to the fact that the appendix lies out of its usual position, or is very long, or the perforation is at or near its apex and the abscess formed beyond. Thus pain on the left side in appendicitis usually indicates that the appendix extends into the pelvis, and this is rendered more certain if vesical symptoms are present. When the pain occurs in the hepatic region, the appendix usually lies forward under the colon with a distal perforation and an abscess extending up under the liver even under the renal fat. The pain, then, indicates the location of the inflammation and its extent. When the pain is excessive it usually indicates pus formation. To determine the presence of the diagnostic points mentioned we make use of the following methods of examination:

1. *History.* The previous history of the case, including a minute account of any deviations from a perfect state of health, must be carefully noted. This account should be given in the patient's own words with as little questioning as possible and carefully noted, with special reference to suddenness of onset and as to there having been previous attacks. A side remark of the patient may be of great importance.

2. *Palpation.* This means of diagnosis is becoming generally employed, and various suggestions are put forth as to how it should be done. It is well, having the patient in the recumbent position, with the head high and the legs flexed upon the thighs and the thighs upon the abdomen, to steady the abdominal wall with the four fingers of the left hand placed just below and to the left of the umbilicus, and then with the fingers of the right hand make firm pressure downward into the right iliac fossa and drawing the fingers firmly over the surface of the iliacus and psoas muscles, and in most cases, even where there is no disease, you can palpate the appendix. I have thought that the appendix has a sensitiveness of its own in a normal condition, and the elicitation of pain must be rather pronounced before we can predicate upon it the diagnosis of inflammation. Indeed, I think an appendix which has once been inflamed is ever afterward more or less sensitive to palpation. It is very easy to err in palpating the appendix. I recall the prediction of Dr. Morris, at his clinic, which did not materialize. I recall one case in which it was quite easy to palpate the appendix; and I diagnosed a thick, chubby appendix; it proved upon operation that the part felt was the normal proximal portion, while the diseased portion was very much atrophied.

3. Rectal, or rectal and vaginal examination. Such examination often discloses the true condition of the appendix, especially if it is low down in the iliac fossa or in the pelvis. Such examination is also of the greatest aid in the differential diagnosis of this condition from the multitudinous inflammations and new formations which occur in the pelvis and its organs.

4. Temperature. The temperature may be only slightly elevated, though there is always some rise above the normal. If it becomes subnormal, pus has probably formed, or perforation taken place. It is not a very reliable aid in diagnosis, for it may be only a trifle above normal when the patient is suffering from extensive abscess. The remission of temperature is no indication that the patient is recovering, and perforation, collapse and death may follow a sudden fall of temperature to the normal or subnormal.

Tumor. Tumor is not present in cases of recurring appendicitis. When it is present it indicates an inflammatory mass, and if the inflammation has existed more than three days it usually indicates pus, but rarely can actual fluctuation be made out.

As I remarked earlier, the diagnosis can be made in most cases, especially in recurring attacks where the history clearly indicates the condition. In fulminating appendicitis with perforation and general peritonitis, the severity of the symptoms, the shock, the rapid onset and the course render the diagnosis easy and certain.

The differential diagnosis of appendicitis from other conditions which may be present is often very difficult. The symptoms are often very similar and the conditions which might be present are so numerous, including diseases of the liver, the right kidney, the pelvic organs, typhoid fever, psoas abscess, intestinal obstruction and even acute indigestion. Most frequently we are called upon to distinguish it from typhoid fever, right renal colic, hepatic colic, acute indigestion and stercoral typhlitis. The differentiation from typhoid fever is the most frequent and also the most difficult. The sudden onset in one otherwise healthy, the board-like abdomen, the possible history of a previous attack, all these point unmistakably to the diagnosis of appendicitis. The lassitude, the gradual onset, the bleeding from the nose and the characteristic morning and evening fluctuation of temperature point to typhoid fever. The palpation, abdominal or rectal, of mass in the abdomen completes the differential diagnosis. From the later indications of typhoid fever it is not always possible to

make so exact a differentiation. In such a case the entire history with the symptoms must be taken in review and usually a correct diagnosis can be made.

From the inflammatory diseases of the pelvis, such as pyosalpinx and ovarian abscess, from the tumors, such as ovarian, fibroid and extra-uterine pregnancy, from the painful menstruations and the disturbances of the menopause, all of which conditions may simulate the symptoms of appendicitis. A correct differentiation can be made by a careful review of the history, and by a careful examination, under anesthesia, if necessary, of the parts involved. It will be found that the appendicular inflammation is less intimately related to the uterus, is more remote from it. Furthermore, each of these pelvic diseases has symptoms of its own; for instance, with fibroid tumor we have menorrhagia; with pyosalpinx and ovarian abscess, we have evidences of septicemia; in painful menstruation, very often both ovaries are affected and we thus have the pain on both sides. The pain is paroxysmal and severe at first and the menstrual flow is present.

Of the conditions of the kidney which may be most readily confounded with appendicitis, we have nephritic colic, pyonephritis, growths of the kidney. In renal colic the pain is over the kidney or radiates to the testicle or bladder. The urine contains blood and other evidences of renal disease. There is an absence of the usual signs of appendicitis.

Hepatic colic is to be distinguished by the history of previous attacks accompanied by jaundice, together with sudden, sharp, cutting pain in upper right hypochondrium and extending through to the back, together with some vomiting. If there is tenderness over the gall bladder without signs in the right iliac fossa, the diagnosis of hepatic colic is complete.

Acute indigestion may in its beginning be mistaken for appendicitis. Although the symptoms may be identical the first few hours, the rapid improvement within a short time under simple home remedies and diet determines the diagnosis.

I have never met, or at least recognized, a case of stercoral typhilitis. We are assured on good authority, however, that such a pathologic condition does exist and that its symptoms are those of appendicitis. Indeed, that appendicitis is often caused by the inflammation in the head of the colon due to retained foecal matter. This inflammation may go on to softening and perforation of the cœcum and abscess formation, a condition if examined at this