Original Articles.

APPENDICITIS.¹

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REMARKS BASED UPON A PERSONAL EXPERIENCE OF 750 CASES; INCLUDING 150 CONSECUTIVE CASES SUCCESSFULLY OPERATED UPON "IN THE INTERVAL."

(Concluded from No. 2, p. 28.)

In two cases a Meckel's diverticulum has been demonstrated by my colleagues after a diagnosis of appendicitis had been made by myself.

Two cases have been observed in which malignant disease appeared soon after the removal of what seemed to be an ordinarily inflamed appendix. In one there was the usual history and physical signs of acute appendicitis. Operation was performed and a large abscess in the right iliac fossa was drained. Some months later the diagnosis of peritoneal tuberculosis was made by examination of the ascitic fluid that was withdrawn. We opened the abdomen and found extensive and hopeless cancerous infiltration.

In another case at the Massachusetts General Hospital the removal of a chronically inflamed appendix was followed in a few months by an extensive cancerous infiltration of the whole ileo-cecal region.

In one instance an acute epididymitis complicating mumps led us a long journey, and in three others pneumonia proved to be the cause of an acute right-sided abdominal pain. In one of these the appendix was successfully removed by another surgeon, but showed no signs of disease.

A tumor at the ileo-cecal valve was in one case supposed to be appendicular. It proved to be an acute tuberculosis of the mesenteric glands of the meso-colon. A dissection carried thoroughly as far as the receptaculum chyli was permanently curative.

In women an acute salpingitis often simulates an acute appendicitis. In some instances the infection from the tubes has invaded the appendix. A differentiation is at times impossible.

There have been included in our list, doubtless, other cases in which the diagnosis was wrong. As a rule, however, it is safe to say that the typical history, physical signs and course of appendicitis make the diagnosis plain. Excepting the cases of referred pain, as in bronchitis and pneumonia, explorations were demanded. In many of the cases of mistaken diagnosis the lesion was hopeless; in others operation was timely and successful, especially in cases of cholecystitis. In the acute obstructions the same heavy mortality followed as in most similar cases.

However imperfectly surgery has been able thus far to repair the damage, more or less irreparable, caused by acute inflammations of the vermiform appendix, the removal of this useless organ in the period of health has proved one of the most brilliant and successful operations of modern surgery.

In the early days of this operation, before its almost perfect safety had been demonstrated, — in this city by Porter, Cabot, and others, — one of the writers was inclined to oppose what seemed to be, in many cases at least, an unnecessary and unjustifiable operation. On June 14, 1893, we were called suddenly to see an intimate friend and colleague who had had three years before a violent attack of peritonitis,

supposed to be of appendicular origin. In the interval he had been advised to submit to operation; we found him dying; he lived but an hour. At the autopsy a general peritonitis was found, proceeding from a gangrenous and perforated appendix. This was an object-lesson which had a marked effect. In August we performed our first deliberate appendectomy upon a young man in perfect health who had had various previous attacks of moderate severity. From that time to the present the efficacy and safety of the operation have been repeatedly demonstrated, until the procedure seems warrantable not only in the cases of repeated attacks of undoubted appendicitic origin, but even in cases in which a lesion of the appendix is only suspected; not only in these, but in all cases in which there has been only one severe attack.

The statistics of the early operations as collected by Bull showed a mortality of two per cent. It seemed then probable that, counting the unpublished cases of death, the mortality would be increased. On the contrary, in the hands of the most experienced operators, the death-rate is less than two per cent. We have operated one hundred and fifty-one times since August, 1894 without a single death.

We approach the operation with confidence, instead of with dread. Though there is in all abdominal operations an element of uncertainty, in this that uncertainty seems almost infinitely small.

Before considering those symptoms which indicate a chronic appendicitis — symptoms which constitute danger signals demanding a careful lookout and an intelligent appreciation — it seems well to discuss for a moment the anatomical and pathological peculiarities of the appendix.

First in importance is that variety of acute lesion which results in a sudden and extensive local gangrene. This is of embolic or thrombotic origin, and may without warning involve the appendix and the meso-appendix. It is undoubtedly induced by variations from the normal which invite a local infection. These variations may be owing to ulceration of the mucous membrane from foreign bodies, neoplasms, fecal concretions or tuberculosis. The infective processes may be caused by extension of inflammation from the cecum; by abnormal positions of the appendix, and by variations in size or in shape. They may result from strictures in the lumen, obstructions at various points from other causes, with consequent appendicular colic and distention with septic fluids.²

These abnormal conditions may induce a mild local infection with transitory pain, persistent or remittent; they may without warning result in total gangrene with a local or a general infection.

The chief question is whether these lesions produce, as a rule, premonitory symptoms. We believe that they do. Serious lesions may have been preceded by similar serious attacks, or they may have been preceded by mild attacks, by premonitory grumblings which

¹ Since reading this paper we have seen for the first time a complete gangrene of the meso-appendix without gangrene of the appendix. The patient was a girl of fifteen, seen March 21, 1898, at Winchester with Dr. Mead. She had had within the year two attacks of colic, with faintness, nausea and purging. The attack during which we saw her began Saturday, four days before our visit, with faintness and abdominal pain. The patient rapidly grew better, however. There was no constitutional disturbance; the bowels were free. The attack was supposed to be like the previous ones. At five o'clock Wednesday she was seized with severe pain and nausea. The abdomen became rigid; temperature 101°; pulse 128; no dulness; no tumor. The abdomen was opened at ten P. M. The appendix was enlarged, injected, unperforated. The meso-appendix was dark green gangrenous and offensive. The interior of the appendix was gangrenous. The patient made a good recovery.

² Read before the Boston Society for Medical Improvement, February 21, 1898.

ought to have been observed and recurrence provided against. In many cases an attack severe enough to produce the gravest danger has presented a history of occasional transitory pain described as indigestion, bilious attack, stomach-ache and the like. In many cases such a history of trivial pains and indigestion has been proved clinically and anatomically to be dependent upon the appendix. In many the appendix has been shown to be constricted, and to be filled with imprisoned septic fluid. Such cases undoubtedly cause appendicular colics, and may result in gangrene; for anything that interferes with the circulation of the appendix, anything that irritates its mucous membrane, may open the door for bacterial invasion. Once having entered, the bacterial process may go on to the most effectual gangrenous disorganization.

The severity of the attack is often out of proportion to the seriousness of the pathological lesion found. In some instances the appendix and its surroundings show most extensive changes when the previous history has been quite trivial. In other cases the clearest histories are followed by little anatomical change in the appendix. At times only a change in position is noticed; at others a slight constriction in lumen. That an appendix apparently normal may be the seat of a serious infection is shown by a case operated upon in the period of quiescence. In this case the patient, a young girl, had one of her usual attacks at three A. M. The operation was performed five hours later. The appendix was found to be covered with a recent greenish exudation, after the removal of which the appearances were precisely like those of an appendix which had been removed the day before and which had been pronounced to be normal. Though it be admitted that many appendices removed in the interval are apparently normal, this hasty conclusion can hardly be explained by the almost invariable disappearance of the previous symptoms.

One of the most important considerations in connection with the indications for appendectomy in the interval is the nature of the previous attacks. The preliminary attacks are in many instances so frequent and transitory, that even the most radical operator would not, we think, advise interference. In many the attacks of pain are accompanied by symptoms of indigestion. Indeed, indigestion is given as the premonitory symptom of many of the attacks, even of the severest forms. That indigestions have some bearing upon inflammations of the appendix is, we think, proved, first, by the disappearance of digestive symptoms after removal of the appendix, and, secondly, by the occurrence of undoubted attacks of gangrenous appendicitis following indiscretions in diet and acute indigestion. In support of the latter statement we would mention two recent examples. The first was a simultaneous attack of pain in the two children of a family. Both had taken something which disagreed with them, and both had attacks of acute abdominal pain, with vomiting. In one the attack rapidly subsided—the attack of indigestion, cholera morbus, “biliousness” or whatever it may be called; in the other there was a gangrenous and perforated appendix which jeopardized the patient’s life, but which was successfully removed. Another still more striking instance was in a family in which three of the boys were suddenly seized with abdominal pain and vomiting. There was only one thing of which they had all eaten. All three boys had attacks of acute indigestion,

accompanied by severe cramps and vomiting. Two of the boys immediately recovered. The third, the oldest boy, had severe pain, persistent vomiting, right iliac tenderness and rise of temperature. It seemed very improbable that one case should be unlike the other two—all having had apparently the same cause and the same initial symptoms. Influenced by this belief, we performed no operation during the acute stage. As the symptoms subsided, it became more and more evident that this boy had had an attack of appendicitis. We removed the appendix some two weeks after the temperature had become normal, and found signs of recent inflammation and of long-continued old inflammation; in fact, the appendix must have been for years a menace to the boy’s life.

In many cases the premonitory symptoms are dependent, probably, upon a stricture in the canal of the appendix, and are owing to a spasm of the appendicular muscles. As demonstrated by Abbe’s method of alcoholic injection there may be in these cases, one or more strictures in the lumen. The symptoms in this class of cases are severe but transitory pains in the region of the appendix. In some instances the restrained fluids cause sufficient distention to make palpation of the appendix possible. In this class repeated attacks of colic, unaccompanied by constitutional or other symptoms except possibly vomiting, are most important symptoms. In such cases, after one or more attacks of colic, the patient may develop the severer type—that accompanied by local infection, gangrene and perforation.

In a large percentage of the cases the premonitory attack is a definite, unmistakable appendicitis with a localized and more or less extensive peritonitis, accompanied by tumor. In considering the significance of an early attack in cases of this kind, and in deciding upon the best time for interference, we must bear in mind that these cases of localized peritonitis show unmistakable signs of their recent origin and that the exudate may be actively septic.

It may be said with reference to the symptoms of the early attacks that in all in which there is no physical evidence of localized peritonitis the diagnosis may be in doubt. The cause and nature of the symptoms must therefore be scrutinized with the greatest care to avoid unnecessary operation. In some cases the right-sided pain may be owing to a spasm of the colon, dependent upon some functional or organic disease of that viscus; in other instances it may be owing to a renal stone; in still others, to neurasthenia. The frequency of right-sided abdominal pain in neurasthenic women must be admitted, and the value of the symptom in patients of this class must be carefully weighed.

But whatever the difficulties of diagnosis, however grave the dangers of a secondary attack, it must be borne in mind that removal of the appendix, even after symptoms which in themselves seem trivial, is not depriving the patient of a useful organ. Arguments against frequent resort to mutilating operations, like normal ovariectomy in cases of persistent ovarian pain, or in cases of the imaginary pain of neurasthenia—arguments against an operation which deprives the patient of a useful organ—do not apply to the removal of the appendix for similar and trivial reasons; for in removing the appendix we are taking away an organ which in a very considerable proportion of the population is a menace to health and even to life. Patients convalescing from the operation have a feel-

ing of thankfulness that the appendix is removed, even if the pain for which the operation was performed still persists; they know at least that the pain is not appendicitis, and that they run no risk from that widely-deadened disease.

Years of immunity after one attack of appendicitis, give no security against a second. In several of the worst cases we have seen in adults, the first attack occurred in childhood.

The chief point in connection with the premonitory signs is to recognize the significance of slight symptoms. In definite cases with localized tumor, or other signs which point unmistakably toward a chronic appendicitis, the advisability of interference is unquestionable. In uncertain cases, however, it is at times extremely difficult to weigh properly the evidence pointing toward a chronic lesion. When there is doubt, it seems best to give the patient the benefit of that doubt and to operate.

In the 150 interval cases there has been a great variety of pathological conditions, and a wide range in the symptoms by which the operation was justified. The symptoms varied, too, with the lesion upon which they were dependent. The difficulties of operation depended largely upon the type of inflammation. In all cases in which the disease was confined to the appendix, and in all cases in which the symptoms were dependent upon a faulty position and shape, the operation was comparatively easy; in cases in which there had been a localized peritonitis, or in which the disease had been of many years' standing, it was extremely difficult. In some cases of long standing the appendix was found so buried in a mass of fibrous adhesions that it was impossible to tell where the bowel ended and the appendix began. Once or twice the inner layers were separated from the outer, a mucous tube being extracted from a fibrous cylinder, not unlike the unsheathing of a sword.

In some cases the operation was difficult from the remote situation and firm adhesions of the appendix; in others the appendix was withdrawn from the wound with the greatest ease. In no case did we fail to find the appendix and remove it. In all chronic cases except the earliest, McBurney's incision was used whenever possible. A non-adherent, deliverable appendix requires a very short cut in a thin-walled abdomen; an adherent appendix a longer one. We have been seldom obliged to abandon the McBurney cut. This method seems to us on the whole the best. In several instances the appendix or its surroundings have had a suspicious look; there have been yellowish masses, or a grumous fluid, or distinct pus. In these cases we have invariably drained for forty-eight hours. The rapidity and thoroughness of the convalescence have not been interfered with. Several of the few cases which have been fatal in the hands of others have been sewed up without drainage. There need be but a single wick going down to the suspicious area. This is removed in forty-eight hours and the wound closed with a stitch left in provisionally at the time of operation. The appendix and its mesentery are tied off with silk, great care being taken to provide against hemorrhage. The actual cautery is used to separate the appendix. Its stump is burned close to the ligature, and the whole depressed into the cecal wall, and buried there beneath four or five fine silk sutures. The wound is closed by one or more silkworm-gut sutures.

Convalescence requires two weeks, the patient going home on the fourteenth day. In the list of chronic cases many unusual and interesting ones are included, but our limited time does not permit even a passing allusion to them. With but one or two exceptions the symptoms have disappeared after operation. It is interesting to note that there have been, long after appendectomy, two attacks of what would be confidently diagnosed as appendicitis. In one case there was only pain; in the other pain, tumor and fever; the latter was an acute case. The results, with these few exceptions, have been so gratifying that but one opinion can be entertained as to the value of the operation. From a feeling of strong doubt as to the advisability of the operation in the interval, we have been led to one of confident enthusiasm; from one of extreme conservatism to one of marked radicalism.

With reference to the treatment of acute appendicitis, on the other hand, we feel more inclined to conservatism than formerly, provided only that we can see the case in the first hours of the attack with the opportunity of careful observation. When we see a case in which we are in doubt about interference, we are often influenced by the patient's distance from surgical aid. One may safely watch for the most favorable moment in a case in a hospital when he would not delay if the case were in a remote town. The safest plan, on the whole, is to consider each case as it stands, operating in some, delaying in others, the question of operation and delay to be decided only by those experienced in the disease. The safety and efficacy of the interval operation make it desirable whenever possible to bring the patient through his acute attack without operation. Severe cases, however, should not be allowed to run in the false hope that an operation can be avoided.

SOME MODERN METHODS OF THE TREATMENT OF PHTHISIS, AND ITS SYMPTOMS.¹

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UNDER general medication I shall speak only of creosote, the alkaline hypophosphites, strychnia, arsenic, and iodoform.

Creosote, known in the days of Louis, and of late years popularized by Sommerbrodt, is perhaps as extensively used at the present time as cod-liver oil. No drug could have retained its hold so long without possessing intrinsic value. Opinions differ as to its action; the extremists hold that it has a specific effect upon the disease and its bacillus; the conservatives, on the other hand, believe its value consists simply in improving nutrition and thereby increasing the resisting power of the individual. "It has the power," says Whittiker, "of destroying the lower organisms, especially those of fermentation, hence the undeniable virtue of creosote is chiefly nutritional." All who have used it to any extent in phthisis can bear witness to the fact that the cough and expectoration are lessened, the weight increased, and the appetite, digestion, and general condition improved. It is contraindicated in gastric or intestinal catarrh, fever and hemoptysis, and where it appears to injure rather than to improve digestion. The dose varies with different practitioners, and whether they hold one or

¹ Read before the Massachusetts Medical Society, June 8, 1898, and recommended for publication by the Society.