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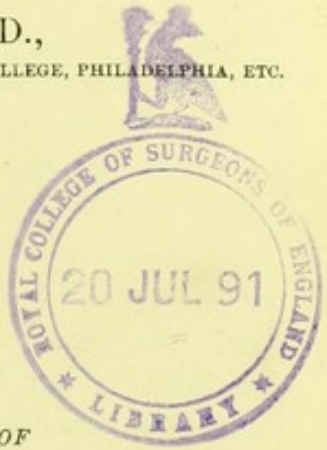

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APPENDICITIS: THE INDICATIONS FOR EARLY LAPAROTOMY.

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In this brief paper I shall have no opportunity of entering into a relation of cases, or of alluding to the technique or to other details, but shall immediately pass to the topic assigned me. I am glad that the Committee have selected the name "appendicitis" rather than the formerly more common "perityphlitis," for there is no doubt that Fitz is quite right in claiming that "every case of so-called perityphlitic abscess must be regarded as primarily one of perforative appendicitis, unless proved to be the contrary," and McBurney is right in estimating that perityphlitis as compared to appendicitis exists in not more than the proportion of one to one hundred. Not that cases of properly so-called perityphlitis do not exist, but that the form which we are to discuss at the present time, namely, an abscess in the right iliac fossa, as well as many other cases without abscess, almost always arise from appendicitis, and most frequently perforative appendicitis. Matterstock found perforation in 132 out of 145 autopsies where there was suppuration; Fenwick, 113 out of 125; Weir, 34 out of 100, and Kümmel places his percentage at 100. Hence I think the prominence that has been given of late to the appendix rather than to the cæcum is amply justified by the facts.

For clinical purposes *five forms* of appendicitis may be recognized. First, a mild form of appendicitis without perforation, ending usually in resolution without the formation of an abscess. Second, perforative appendicitis, followed by general peritonitis. This form appears in two different modes: (*a*) a severe, early and often fulminating peritonitis, and (*b*), a form which is apparently mild, and, after continuing so for a certain length of time, suddenly bursts out into a disastrous general peritonitis, either from perforation of the appendix or rupture of an abscess, which sometimes has not even

been recognized. Third, the most common form, in which the appendix is perforated, and a local—and, as McBurney has happily called it, a "comparatively safe" or "comfortable"—abscess forms more or less rapidly, and either is operated on or ruptures externally or into a hollow viscus, and finally ends either in resolution or death, usually within two, three, or four weeks. Occasionally by the rupture of the abscess into the general cavity of the peritoneum this form is suddenly transferred to the preceding class. Fourth, a class in which the abscess forms slowly and follows a chronic course, lasting for not only weeks, but even months, and it may be a year, before it either discharges or is operated on. Fifth, recurrent appendicitis, in which attack follows attack at longer or shorter intervals, until finally the last attack kills, especially if not operated on, or the patient may, perchance, recover. From the very nature of the topic assigned me, "Indications for Early Laparotomy," the last two forms are excluded from this discussion except incidentally.

First, the mild form of appendicitis. That this is frequent is proved abundantly by the statistics of Tofft, Hektoen, and Fitz; so frequent, indeed, that we must assume that nearly one-third of all adults have had one or more attacks. Most of them have been overlooked, perhaps, for in most cases that I have seen the attack has been deemed by the patient to be one of simple indigestion, or of colic, or of some other similar and common intestinal disorder. This very frequency has been urged by some as a reason for frequent operative interference. To my mind it argues precisely the reverse. If one-third of all post-mortems of adults give evidences of appendicitis recovered from without abscess and without operation, it is to my mind the strongest reason why, on general principles, we should deem that an operation in this class of cases is by no means often to be done. But it is especially to be observed that these attacks which have been recovered from by medical means alone have been of a mild form, and have usually been unrecognized as appendicitis except on the post-mortem table. We may, therefore, dismiss this class of cases as not requiring any operation, save in exceptional cases.

Second, precisely the contrary may be said of the next class, of which every case demands instant laparotomy; namely, those cases of perforative appendicitis which are followed by general peritonitis, often in such a fulminating form that life is destroyed, even in the course of twelve to twenty-four hours. Such a form as this is usu-

ally easily diagnosticated, and the indications are so clear that they cannot be mistaken by any well-informed physician or surgeon. Unfortunately in too many of the cases the need for instant laparotomy is so urgent that it is impossible for the physician to call the surgeon in consultation, and for the latter to make the necessary preparations as to assistants, dressings, etc., before the patient is almost past hope. No cases in surgery, saving, perhaps, hemorrhage from large wounded vessels, require more prompt interference, and even then with comparatively little hope of rescuing the patient. The indications for instant laparotomy are: Brief symptoms of recent appendicitis, or of one or more recurrent attacks, followed by sudden excruciating pain all over the abdomen, but most severe in the right iliac fossa, with the familiar picture of general peritonitis and impending collapse.

Sometimes, however, instead of this acute course from primary perforation the case will apparently first belong to the category of milder cases requiring no operation. The patient is seemingly doing well, has but slight fever, moderate pain and tenderness, and but little tumefaction. He may even be improving, and the fears of the physician may have been lulled by the apparent security which makes the awakening the more startling. In spite of the deceptive mildness of the attack ulceration has gone on insidiously till perforation, or in many cases gangrene of the appendix, has occurred.[1]

Some, if not many, of these cases must go on, unrecognized even by the most careful observers, but I earnestly believe that operation is rightly undertaken when there is persistent pain and tenderness, especially at McBurney's point, with even slightly increased resistance without any tumor, with possibly a slight œdema and a moderate fever. An exploratory operation in careful hands with modern antiseptic methods has comparatively little risk, and I believe this risk will result in fewer deaths by far than will the expectant delay which has been generally heretofore the rule. Show me a case operated on in which the operation was a mistake, and for every one, ten can be shown in which the Fabian policy of waiting for the signs of tumor or of peritonitis was fatal. Even if the operation was unnecessary, and, therefore, a mistake, it will rarely cost a life, but the opposite mistake is nearly always fatal.

[1] I believe there has been no bacteriological examination of the contents of the unruptured but catarrhal or ulcerated appendix. It is greatly to be desired that such should be made and the nature of the contained microörganisms be ascertained.

Most commonly, however, I believe these cases belong at first to the next class, in which an abscess, not perhaps of large size, has really formed, and, not having been recognized and operated upon, it has suddenly burst into the peritoneal cavity. In many instances again it is impossible to distinguish between those cases which will run a continuously mild course and terminate in resolution and the apparently mild cases which run a nearly parallel course, but which are accompanied by abscess and finally burst into such fatal fierceness.

But I believe it is not impossible, by minute and careful observation of the points to which attention is called in the next class, to be able in general to determine whether an abscess has formed, especially by the most minute and delicate palpation, sometimes by rectal and vaginal examination; often by the possible overlying œdema; and generally by the tenderness at McBurney's point, in addition to the general constitutional symptoms. These general constitutional symptoms, it can scarcely be too strongly insisted on, are far inferior to the local signs in forming an accurate diagnosis. Even the temperature, so commonly a reliable guide, may be most deceptive, for the lesion is distinctly local in its chief activity and the body heat is usually only moderately elevated and may subside while the local process is absolutely progressing toward a most dangerous or a fatal issue.[1] The only general symptom of special value is severe pain arising, as has been pointed out by Stimson, not as an initial symptom, when it is often severe, even in otherwise mild cases, but arising more or less suddenly in the course of the attack. This very pain itself may be more justly called a local than a general symptom.

I would lay it down as a rule, therefore, that even in mild cases, and in cases that are apparently convalescing, if the indications point even slightly toward pus an early operation should be done. If pus is present the propriety of an operation, I am sure, will be denied by no one, and if it is absent a simple exploratory operation with all the precautions of modern antiseptic surgery is so far from being dangerous that no patient should be allowed to run the risk of a probable or possible rupture and general peritonitis. An explor-

[1] Since this paper was read I have operated in the Jefferson College clinic on a young man ninety-two hours after the beginning of the attack, with a morning temperature of only 99°, and yet an inch of the appendix was falling into gangrene around a large fecal concretion, and a half pint of fetid serum and flakes of fibrinous exudate were discharged from the right iliac fossa. He has recovered without a bad symptom.

atory operation "carries with it less danger than the disease." The same challenge just made above may be confidently repeated.

That such apparently mild disease may be seemingly progressing toward recovery, and yet imperatively demand an operation, is well seen in a case reported by me in the *Medical and Surgical Reporter*, so long ago as February 6, 1886, page 165, which was as usual regarded by the patient at first as an ordinary colic. When I saw him on the sixth day his temperature, which had been 102.4°, had fallen on the fourth day, and on the sixth day was only 99.4°. The pulse was only 88, legs extended, belly not markedly tender. The pain had almost disappeared, so that he was comfortable, could turn in bed and use his right leg without suffering. No fluctuation could be detected and deep pressure produced but little pain, but there was considerable œdema, and an operation revealed an abscess containing nearly a pint of fetid pus. Moreover, we must remember that peritonitis and death may occur even without either gangrene, perforation, or a local abscess.

The third class of cases, however, is that which most frequently comes under the eye of the surgeon. They occupy a middle place between the mild form, so often overlooked, and the acute form of general peritonitis. Even in this class the symptoms are not seldom latent and may escape notice unless the physician is on the alert and has been forewarned of the possibility of appendicitis, either by such a discussion as the present one, or by his reading, or it may be by sad experience.

Usually there will be more or less pain, commonly quite severe. This pain is often not at first located in the right iliac fossa, but may be over the whole abdomen, in the epigastrium, the hypogastrium, or even the left iliac fossa. In time, however, though it may persist elsewhere, it generally becomes most severe in the right iliac fossa. Dr. McBurney has done a good service in pointing out that tenderness to pressure is especially marked at a point "an inch and a half to two inches from the anterior superior spine on a straight line toward the umbilicus," and it is best determined by pressure with the tip of one finger. Sometimes the tender point is a little lower than this line. It is often best indicated by the patient himself. With this pain will usually go nausea, vomiting (not stercoraceous) and constipation. The fever will be marked but rather moderate, rarely over 103° and more commonly in the neighborhood of 101° or 102°. Dulness on superficial percussion not seldom may be

absent by reason of interposing coils of intestine. Deep percussion may, however, show diminished resonance and even dulness; and a delicate touch may discover increased resistance, and this physical sign as well as the dulness may be marked. Both of these signs are generally best marked under ether. Even when a large abscess is present I have never been able distinctly to discover fluctuation, and I place no reliance whatever on the absence of this sign. A sign which has been too much neglected, I think, is the œdema which is so commonly seen overlying a deep abscess. If the right iliac fossa be doughy with œdema, I believe it is almost always a reliable sign of suppuration.[1]

Moreover, pus will be present much earlier than was formerly supposed to be probable, and, therefore, an operation should be done much earlier than we formerly believed to be wise. Willard Parker, in 1867, was the first to compel the profession to hear him, and recommended that an operation should be done between the fifth and twelfth days. With increasing experience, and especially in the light of better results from earlier operations, last year Fitz expressed the view that the third day was not too early. When we remember that these cases arise from abscess, produced either by extensive inflammation of the appendix, or far more commonly from gangrene or from perforation; that such perforation will instantly light up a sharp local peritonitis limited by the agglutination of the neighboring coils of intestine, and that common experience shows that even in connective tissue, as, for instance, from a felon or a boil, pus readily forms in forty-eight to seventy-two hours, we must expect that in the peritoneal cavity pus will form at least as early. This presumption has been turned to certainty by a number of recently reported cases. The limit set by Fitz, then, does not seem unreasonable. Even as much as three pints of pus have been found by the fifth day. This large quantity would require certainly two to three days for its accumulation after suppuration had begun.

To establish the existence of pus I was formerly inclined to use the hypodermatic syringe, but a larger experience has convinced me that an exploratory operation is much more certain and also much less dangerous than the needle. The disease, it must be remembered, is apt to prove fatal at an early date. In the 176 cases col-

[1] Several times I have noticed this œdema in the layers of the connective tissue between the muscles even if absent under the skin. Its existence is of great value as a positive indication of pus at a lower level.

lected by Fitz, 68 per cent. died in the first eight days, and two-thirds of these between the fourth and eighth days.

I should, therefore, formulate a general rule that by the second, certainly by the third day, and *a fortiori* later, the operation should be done if the following indications are present:

First, if there is abdominal pain, most marked in the right iliac fossa and especially with tenderness at McBurney's point, attended possibly with nausea and vomiting. Secondly, if there is rigidity of the right abdominal wall. Thirdly, if there is fever up to 100°, 101°, or 102°, which does not yield to medical treatment. Fourthly, if by minute and careful palpation, tumefaction and increased resistance can be discovered, with possible dulness and rarely fluctuation; and Fifthly, if there is œdema of the abdominal wall.

Pus will generally be found, but it is possible that there may be none. If pus is present the abscess cavity is to be evacuated and washed out with great care, lest its frail wall be broken down and general peritonitis ensue. If there be no pus the appendix should be sought, and if, as will, I believe, almost uniformly be the case, it is swollen, thickened, distended, the seat of a concretion, or otherwise abnormal, even without perforation, it should be tied and cut off, and the stump either be simply disinfected, or, as I prefer, inverted and covered by a few Lembert stitches through the outer layers of the cæcum.

The brilliant results which have been reported by Senn, Treves, McBurney, Stimson, Bernardy, Baldy, and others, in cases in which no pus was present but the appendix was perilously diseased, have abundantly shown that such an appendix is a menace to life compared with which the dangers of an antiseptic operation are nothing. Moreover, I should be decidedly in favor of an operation even if there were present only iliac pain, tenderness at McBurney's point, rigidity of the abdominal wall, moderate fever and increased resistance, without tumefaction and dulness, nausea, and vomiting. The unusually large personal experience of Fitz shows that five-eighths of all cases and one-fourth of the cases which had been treated medically alone should have been operated on. With so large an experience from so careful and accomplished an observer, it is a crime for us to go on allowing case after case to die that ought to have been relieved by surgical interference.

I cannot close this paper without calling special attention to what I believe is a most important point in connection with appendicitis,

and it is especially appropriate to so large and influential a body as this, composed both of physicians and surgeons from all parts of the Empire State. The warning has already been sounded, but it cannot be too strongly insisted upon, that in every case of suspected or proved appendicitis or perityphlitis, a surgeon should be called in consultation *at the outset*. If called later when an emergency has arisen and there is need for surgical interference, if the need be absolute, it is of course evident that the surgeon will immediately operate. But in the great majority of cases he will necessarily be tempted to be cautious and conservative, desiring greater familiarity with the details of the case, and to postpone any operative interference, at least for one or two days, too often a fatal delay. This is neither fair to the surgeon nor to the patient. The need for familiarity with the case on the part of the surgeon, and the right of the patient to have the very best time selected for the operation, demand that the surgeon should be called in consultation early in the case, that he should be familiar with it from repeated visits, and should be ready instantly to seize the favorable moment for operation. It must not be thought that any conscientious man, because he is called in as a surgeon, will wish immediately to operate; but it is his right, and it is also the right of the patient, that the surgeon, in order to be able to determine this momentous question wisely, should have the entire course of the disease at his fingers' ends by frequent personal observation, rather than by information filtered all at one time through the mind of the physician.

Confessedly many cases are doubtful and require the most careful weighing of the evidence for and against operative procedure. The surgeon who has attended the case in consultation with the physician from the outset, and the physician who all along has had the benefit of the surgical advice of a colleague, will both be far better fitted to cope with any sudden emergency, and both will be far more likely to select the wisest time for the operation. The very first "indication for early laparotomy in appendicitis," therefore, is to call in the surgeon early.