that malignant disease was being dealt with. Similar cases have been similarly treated by other surgeons, and it is only comparatively recently that it has come to be recognized how closely the two conditions may resemble each other in symptoms and signs.

Infiltrative colitis also occurs in other parts of the colon besides the sigmoid, but it seems that this segment of bowel is almost always involved when the disease affects the descending and transverse colon. Usually in the descending and transverse colon it occurs as an extension backwards from the sigmoid. On the other hand, the primary seat is sometimes the ascending colon and caecum. We are much in need of further information on the pathological anatomy of the disease. Up to the present we have only clinical observations from which to draw conclusions. No doubt this needed knowledge will soon be forthcoming now that clinical study has led to its recognition as a condition with well-characterized signs and symptoms.

THE DIAGNOSIS AND TREATMENT OF APPENDICITIS.*

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APPENDICITIS is a malady that has come much to the front of late years; so much so, that most of our patients are acquainted with it, at any rate, by name. But if we look into any of our older textbooks—for example, the first edition of Fagge's *Medicine*, published in 1886—we shall find no mention of appendicitis, although what is no doubt the same disease is described under the name of "perityphlitis," and is looked upon as having its origin in the caecum; a note is, however, made that Dr. Wilks (now Sir Samuel Wilks) had ascertained *post mortem* that some cases were associated with ulceration or perforation of the vermiform appendix.

When we consider, however, that at the present time appendicitis and its complications account for nearly 40 per cent. of all cases of peritonitis, and that in times past numbers of deaths are stated to have occurred simply from peritonitis—or, as it was called, "inflammation of the bowels"—we can have no doubt that a great number, or, if we put aside the very young and the very old—in whom acute abdominal trouble is most generally due in the one case to intussusception and in the other to malignant disease—the greater number of these deaths must have been due to appendicitis, although not at the time recognized as such.

As, therefore, appendicitis is the cause of many serious and fatal illnesses, it may be worth our while to consider its diagnosis, and by what treatment we can best reduce this heavy mortality.

In order to clear the ground it may be well to take into consideration a few facts regarding the anatomy and pathology of the appendix.

The vermiform appendix in the fetus is directly continuous with the caecum, representing its terminal portion, but as development proceeds becomes more clearly marked off, becoming provided with a fold of mucous membrane at its orifice, the valve of Gerlach, which tends to prevent foreign bodies from passing into it from the caecum. The appendix consists of a lining mucous membrane, a submucosa, a muscular and an outer serous coat. It is provided with a meso-appendix, in which run vessels, nerves, and lymphatics. The mucous membrane contains tubular glands lined with a single layer of columnar epithelium, but the most noteworthy point about it is its richness in lymphoid tissue—a richness which is particularly marked between the ages of 10 and 30, after which age it diminishes in amount, the whole mucosa undergoing atrophy. From this richness in lymphoid tissue the appendix has been called the "intestinal tonsil," and it is probable that this lymphoid tissue performs some function of a protective nature against the bacteria which are found in such abundance in the caecum. It is noteworthy that in those animals which have no appendix there is a mass of lymphoid tissue at the apex of the caecum.

* Read before the Boston and Spalding Division of the British Medical Association.

Looking at the diseases of the appendix from the clinical point of view, this analogy to the tonsil is helpful in explaining the origin and course of the majority of cases of appendicitis.

The appendix used to be looked upon as a receptacle for all manner of foreign bodies, from cherry-stones to shot-pellets, and when appendicitis first became recognized it was considered due to the entrance of these bodies. But we now know that it is very rare for a foreign body to obtain entrance into the appendix, and that the apparent foreign bodies are generally concretions of faecal material largely consisting of bacteria, material which, at first liquid, has gradually become consolidated. These concretions are generally only met with in appendices which have in time past been the subject of inflammation; they are the result, rather than the cause, of appendicitis.

To what, then, must we look as the cause or causes? Probably in every case these are of a septic nature, the bacteria in the caecum and appendix setting up inflammatory changes in the lymphoid tissue, just as in the throat tonsillitis has so often a septic origin.

Slight attacks may pass unnoticed, but may lead to a fibrotic change in the mucous membrane and submucosa, just as repeated attacks of tonsillitis cause fibrosis of the tonsil. These fibrotic changes will render the appendix more liable to trouble from retention of its secretion with increased bacterial growth and the formation of concretions, until the first sign that the patient has of any trouble is an acute attack.

The analogy between appendicitis and tonsillitis is further borne out by the undoubted fact that many cases are rheumatic in their nature, and are relieved by the administration of salicylates, just as these will so often give relief in tonsillitis.

If the resistance of the patient is diminished by cold or fatigue, and if there is a superabundance of bacteria, a very slight indiscretion in diet may precipitate an attack, without any previous changes in the organ, an attack which may be of such severity as to cause ulceration or gangrene of the appendix, rapidly and without warning.

CLASSIFICATION OF CASES OF APPENDICITIS.

Clinically we may divide appendicitis into:

1. *Catarrhal Appendicitis*, the mildest form which has a strong tendency to recovery; but it is to be noted that in this catarrhal form the epithelium of the tubular glands of the appendix, which is a single layer, is shed, and thus there is opened a door for infection which may spread to the deeper tissues.

2. *Ulcerative Appendicitis*, in which not only is the epithelium shed, but the mucous and submucous coats are opened up. The mischief may stop at this point, but all the same, if the patient recover he will carry about with him a damaged appendix with a weakened mucous membrane, and probably a strictured lumen, leading to the formation of a cystic dilatation, the contents of which will form an excellent nidus for further infective organisms.

3. *Appendicitis* (with or without perforation) and *Abscess*.—Here we may have:

(a) An abscess pointing through the abdominal wall.
(b) An abscess in the peritoneal sac, more or less shut in by adhesions.
(c) More rarely an abscess outside the peritoneal sac, generally well to the right side, creeping up behind the ascending colon.

(d) An extension of the suppuration along a definite route, which, according to some surgeons, varies according to the position of the appendix—that is, if this lies to the outside of the caecum, we may meet with pus tracking upwards along the outer side of the ascending colon to the right kidney pouch, then beneath the liver, and then between the liver and diaphragm, forming a subphrenic abscess; this may track still further, penetrating the right pleura, or it may in an extreme case perforate the suspensory ligament of the liver and be found beneath the left half of the diaphragm.

If the appendix is situated below the caecum, pus will be more likely to be met with in the pelvis, and if it is internal, then we may meet with pus passing inwards among the coils of small intestine, leading to:

(e) General suppurative peritonitis.

4. Lastly, if we have to deal with an intensely acute inflammation, the disease may run a terribly rapid course

—the so-called “fulminating appendicitis”—the patient dying of toxæmia within forty-eight to seventy-two hours, unless relieved by operation, and even then the recorded mortality is from 75 to 95 per cent. It is to these fulminating cases that I would particularly direct your attention when we come to consider the question of diagnosis and treatment.

DIAGNOSIS OF APPENDICITIS.

The important symptoms in a case of simple acute appendicitis are pain, tenderness, and rigidity of the abdomen, most marked over the appendicular region.

The pain often follows an indiscretion in diet, exposure to cold, or exertion; it may at first be referred to the epigastrium or umbilicus, but after twelve hours it is usually referred to the right iliac fossa. It sometimes radiates in the direction in which the appendix lies, although this is by no means an absolute rule. This may afford some indication for the operation to be performed.

It is sometimes difficult to distinguish this pain from pain in the right ovary; more particularly as an attack of appendicular colic may precede a menstrual period, probably caused by the ovary receiving part of its blood supply from a branch of the artery to the appendix; the premenstrual congestion of the ovary being accompanied by a congestion of the appendix. Conversely, a diseased condition of the appendix may cause ovarian pain and menorrhagia, and I can recall one case of my own in which removal of the appendix was followed by a cessation of the menorrhagia.

It is not infrequent to meet with cases, especially in children, in which there is pain over the bladder at the end of micturition. This may be so acute that the child refrains from passing water for as long as possible.

The tenderness is generally most marked at the point called after McBurney, where the line drawn from the right anterior superior iliac spine to the umbilicus crosses the edge of the right rectus. This point is said to indicate the point of origin of the appendix. Generally, however, this is a little lower down, at the point called “Clado’s” point, where the line drawn from one anterior superior iliac spine to the other crosses the outer edge of the right rectus.

Mr. Sherren has shown that the tenderness may be met with over any part of the area supplied by the eleventh dorsal nerve. It may be elicited by gently pinching up the skin, so long as the appendix is not perforated, after which occurrence this sign is generally absent—a point of some importance in the diagnosis.

The rigidity is confined in a simple case to the lower right quadrant of the abdomen.

To these chief symptoms must be added obstinate constipation, vomiting which usually subsides after the first few hours, except in the fulminating forms.

The temperature is generally raised, except in a case of simple appendicular colic, or in a case of fulminating appendicitis which is rapidly going the wrong way.

The pulse is generally increased in frequency to some extent; its rate and character afford an indication of the progress of the case of the utmost importance, a steadily increasing frequency being the most marked sign of ill omen, whilst a steadily diminishing rate affords a good prognosis. As a general rule a rate above 100 per minute should be regarded as a danger signal.

The tongue is furred, and in some cases may be very dry and coated.

A rectal examination should never be omitted, as although in a simple case nothing abnormal may be found, yet we shall in this way obtain valuable information in a case in which there is pelvic peritonitis or suppuration.

Such an attack may terminate in—

1. Complete recovery, the temperature falling to normal about the third day, the pulse steadying down, the pain subsiding, and the bowels acting.
2. Apparent recovery, but with a tendency to relapse.
3. Localized suppuration.
4. General suppuration.
5. The attack may prove to be one of the fulminating type.

The symptoms are those of an acute attack, but of greater intensity, the pain much greater, the tenderness all over the abdomen, with early tympanites. In some of the worse cases there may be a cessation of pain.

Often there is an initial rigor. The pulse rapidly

increases in frequency, becoming small and feeble, the face has an anxious, drawn expression, the skin becomes clammy, and the temperature falls below normal. The progress of the case is rapid, the patient generally dying of intense toxæmia within forty-eight hours of the onset.

TREATMENT.

1. The Treatment of Simple Appendicitis during the Attack.

Here we are on extremely debatable ground, some surgeons urging early operation and removal of the appendix; others, of whom I am one, holding that we should wait, and, unless the symptoms point to fulmination, endeavour to tide the patient over the attack by rest and treatment.

Sir F. Treves¹ says, “Hospital statistics are satisfactory only up to a certain point, since they of necessity deal with cases of the most severe type. The best record which could be obtained would be based upon the experience of a large number of men in private practice.”

It is principally with this end in view that I have chosen this subject for our discussion.

My own small experience is that simple cases can with care be tided through the attack.

The line of treatment that appears to be most useful is:

(a) Absolute rest and quiet; the knees being placed over a pillow.

(b) Very low diet, the food being the simplest liquid food, such as albumen water or Brand’s essence and water. It is by no means bad treatment to give nothing but water for the first twenty-four hours. Milk if given should be diluted and peptonized.

(c) The application at frequent intervals of hot fomentations to the abdomen, a piece of lint thickly covered with the glycerine of belladonna being applied to the seat of pain under the fomentations.

(d) Speaking generally no attempt should be made to move the bowels until the fourth or fifth day, and not until the seventh if an abscess is forming, when calomel and a saline aperient, such as phosphate of soda, may be given, followed, if necessary, by an enema.

(e) A simple saline mixture with hyoscyamus, or belladonna, or with salicylate of soda if there is any suspicion of a rheumatic tendency.

(f) The flatulence is best kept in check by salol in powder.

Here two points present themselves for discussion: the advisability of giving or withholding opium, and the use of aperients.

Opium used, in time past, to be regarded as our sheet-anchor in all cases of peritonitis, relieving the pain and quieting the restless patient, and it certainly produces an appearance of the very greatest improvement in the state of the case—the pulse becoming slower, the aspect more cheerful, and the patient in every way feels better. But this is only too often merely the appearance of improvement, the disease continuing unchecked until the time has passed for any help to be given. I would most strongly urge that opium should on no account be given in appendicitis unless it be in the case of a patient having to undertake a journey to the hospital, when morphine might be given, the hospital house-surgeon being, however, informed of the fact. Apart from the danger of the symptoms being masked, opium is a source of danger by paralysing the intestines and causing tympanites.

As to the use of aperients, a simple saline aperient might be useful in a case of appendicular colic to clear away any peccant substance, but we have to carefully discriminate between such simple cases and those that are more severe, in which an aperient would at once disturb the inflamed parts. Some surgeons are strong advocates for the use of an enema, but we must be careful to bear in mind the close relationship of the rectum to the inflamed area.

2. Treatment during the Interval.

There is no question that, in the case of patients who have had several attacks of simple appendicitis, the correct treatment is to remove the appendix during a quiet interval; in careful hands this has a mortality of only about $\frac{1}{2}$ per cent. How many attacks should a patient be allowed to go through before having the appendix removed?

Provided that a patient takes warning from his first attack, and carefully avoids anything that might lead to another, such as hurrying over meals, eating indigestible

substances, neglecting the regular daily action of the bowels, careless exposure to wet, cold, or over-fatigue, he may never have a second attack; but yet statistics show that from 25 to 44 per cent. of first cases relapse, the relapse generally taking place within two years.

Such a recurrence indicates some permanent damage to the appendix, and a consequent liability to further attacks, any one of which may fulminate. I think, therefore, that the removal of the appendix during a quiet interval should be strongly urged upon a patient who has had two attacks; and he would be well advised to bear the operation after the first attack if it had been severe.

3. *The Treatment of a Fulminating Attack.*

Here the patient is in a desperate condition, which has been well compared to a strangulated hernia or a perforated gastric ulcer. If left the case becomes hopeless within forty-eight hours, and operation affords the only chance, and that but a slender one unless performed within twenty-four hours.

Fortunately, only about 1 per cent. of all cases are of this character; but it is in these that some means of diminishing the heavy mortality is so much to be desired.

Such a case occurred in my practice a few months ago, and it may, perhaps, be worth our while to consider it somewhat in detail as an illustration of the symptoms and diagnosis of this fulminating form.

I was called at 6 p.m. to see a servant girl, aged 20, who was violently sick and had pain in the abdomen. She had been very well until dinner time, when she had eaten some cold roast duck very heartily. I found her sitting up in bed, with her knees drawn up, vomiting a green bilious fluid, complaining of intense pain at the epigastrium. Her face had a typical abdominal expression. The bowels had been open the day before, but not freely; she was of a constipated habit. The pulse was 96; temperature, 99°.

What were the various possibilities of the case?

In the first place she might be suffering simply from an acute attack of indigestion. She looked, however, rather too ill for this. There was no hernia to be found, an inquiry which should never be omitted. The situation of the pain was suggestive of a gastric ulcer which had perhaps perforated. It is however unusual for this to recur without some previous history of gastric pain. She had never had this, nor yet hæmatemesis or melaena. The comparatively quiet pulse was rather against a perforated gastric ulcer. Nevertheless this was a possibility which weighed strongly with me. The menses were regular, which enabled one to put on one side the possibility of tubal pregnancy.

There was no history of jaundice, so that the pain was not likely to be due to a gall stone, neither was it like that of renal colic, which may at times be difficult to distinguish from appendicitis.

The bowels had been moved the day before, so that we had hardly to deal with a case of acute obstruction.

Bearing in mind that pneumonia will sometimes at its onset give rise to acute abdominal symptoms, I examined the chest, but there was nothing abnormal to be found.

It seemed to me that the case was either one of acute indigestion with bilious vomiting, or, more likely, a case of appendicitis of which the symptoms had not yet become definite, or possibly, but less probably, a case of gastric ulcer. Looking at the case as a whole, I felt justified in waiting a few hours until the shock had passed off and more definite symptoms had declared themselves. I therefore procured the attendance of a nurse, and ordered hot fomentations to the abdomen. Having regard to the green vomit and pain at the epigastrium, I ordered a simple stomach mixture of sod. bicarb. and acid. hydrocyanici dil., with calomel gr. j., to be repeated in one hour—a useful way of giving calomel if there is sickness.

I did not give any opium lest the symptoms should have become masked—a point the importance of which I would most strongly urge; over and over again have I seen abdominal cases where the patient was so deeply under the influence of opium that the whole aspect of affairs was entirely altered—the pain gone, the expression cheerful, the pulse quiet and steady, although the patient was within a few hours of death.

After the expiry of twelve hours the symptoms pointed definitely to appendicitis; there were pain and tenderness at McBurney's point, rigidity of the right lower quadrant of the abdomen, a slight rise of temperature to 100°; a rise in pulse-rate, 108.

Was this a case of acute appendicitis which might be tided over, or was it one of fulminating appendicitis? The severity of the onset pointed to its being the latter, and I removed the patient to the hospital. After her arrival the pulse-rate was found to be increased to 130.

On opening the abdomen in the appendicular region some turbid fluid was found round the appendix, which was gangrenous for the greater part of its length. This necrosis had evidently been of very rapid and acute onset, for there was no

macroscopic solution of continuity in the organ. It was as though an intensely virulent inflammation had caused thrombosis of the vessels. The appendix was removed, and the wound drained with gauze. The patient made a good recovery, somewhat delayed by local suppuration.

From this case we may, I think, learn:

1. That every now and then cases will occur in which the disease is of the most acute type, inflammation arising in the appendix, and progressing with such rapidity and violence that the whole organ is speedily destroyed, and an acute septic peritonitis set up unless operation is done without delay.

2. That if the fulminating appendix is removed within a few hours of the onset all may yet be well.

3. That a case may take on a fulminating character from the very beginning, and that our only chance of saving life lies in the watching of the case at short intervals, refraining from giving opium, and operating as soon as the malady is seen to be steadily and rapidly becoming more acute.

In these cases there is often a period of comparative quiet, after the first shock of the onset has passed off; this is the surgeon's opportunity, for an operation may now be done with almost as much ease as in the interval between the attacks. If the opportunity be allowed to pass, the patient becomes rapidly worse, and the operation is fraught with the extremest danger. The pulse-rate is our best guide, a steadily-increasing frequency showing that the heart muscle is being poisoned by toxins calls for immediate interference, especially if, with the rise in pulse-rate, is conjoined a fall in temperature.

Beside the pulse-rate, the facies, tongue, pain, and increasing leucocythaemia are all danger signals, but of these the pulse-rate is the most valuable.

If the operation is done within the first twelve hours there is good hope of saving the patient's life, but every hour's delay adds to the danger, and after thirty-six hours the hope is but a slender one.

4. *The Treatment of Appendicitis with Suppuration.*

Here we have to distinguish between two widely different conditions—(a) localized suppuration, where the pus is shut off from the general peritoneal cavity, and (b) general diffused suppurative peritonitis, in which there is no shutting off by adhesions, but pus spreads throughout the whole peritoneal cavity, causing a rapidly fatal toxæmia.

Sir Frederick Treves in 1902² laid it down as a rule that "immediate operation is demanded in every example in which there is reasonable suspicion that suppuration has taken place." But this is a matter upon which there is great diversity of opinion, many surgeons preferring to wait until after the fifth day if there are signs that the pus is localized and shut in by adhesive peritonitis, so that it may be evacuated easily and safely without risk of causing general infection.

Here it may be of interest to trace the history of operative procedure in these cases.

When appendicular abscesses were first recognized and opened, there is no doubt, as was shown by Mr. James Berry, that many patients died rapidly from general infective peritonitis, owing to the abscess having been opened in such a manner that the general cavity of the peritoneum was at the same time exposed to infection. He urged that the best and safest procedure was to wait until the pus had been shut in by adhesions, which generally occurred by the fifth day, when the abscess could be opened safely.

But, unfortunately, in many instances the pus does not become thus limited in extent. The infection may be so intense and suppuration so profuse that pus rapidly makes its way between the coils of the intestines; or if a circumscribed abscess forms, yet it may speedily burst; or if it does not, yet it may burrow, forming cavities which can only be drained with difficulty, and death may occur from septic absorption.

Experience alone can tell us in these cases when to operate and when to delay; but speaking generally, if there is a definite circumscribed tumour, we shall be justified in waiting until after the fifth day, always supposing that the patient's general condition remains satisfactory. A rigor should be a signal for immediate action; so, too, should an increasing frequency of pulse. If it can be done, a leucocyte count, taken at short

intervals, may give an indication whether pus is forming or not, a leucocytosis of 20,000 or more pointing to the presence of pus. During the past five years our technique has much improved, and it is now safe to evacuate pus from an appendicular abscess as soon as it can be recognized, provided that before doing so the area of operation is localized and shut off from the general peritoneal cavity, by careful packing with a double bulwark of gauze, the outer layer of which can be left *in situ* for twenty-four hours after the evacuation of the pus.

One of the greatest advances in the treatment of these cases in the past two years has been the greater attention that is paid to the position of the patient—the head and shoulders being raised, and if necessary the head of the bed also raised, so that pus may tend to gravitate into the pelvis, instead of tracking up into the subphrenic region, where it is much more likely to cause a fatal toxæmia.

It may be necessary to drain freely, using large rubber drains. In one such case that I saw successfully operated upon, pus poured out from incisions above the pubes, and in the right and left iliac regions. Four large drain tubes were put in, down to Douglas's pouch in each iliac region, and running up to the liver. The patient steadily and speedily recovered.

Our hope of saving such cases of general suppurative peritonitis has been immensely increased by the method of continuous subcutaneous infusion, several pints of saline solution being run into the thighs by one or two hollow needles and a simple siphon. No attempt should be made to flush out the abdomen, for this will only result in spreading the infection still further.

In these cases of general suppurative peritonitis it is absolutely necessary to get the bowels to act, calomel being given in grain doses hourly.

CONCLUSION.

I would recapitulate our position in dealing with appendicitis as follows:

1. The majority of cases will get over the attack if treated on simple medicinal lines.
2. During the quiet period the appendix should be removed.
3. During an attack the patient should be carefully and frequently watched, and on any sign of fulmination operation should be done at once.
4. If there be suppuration, if all is going on otherwise satisfactorily, the evacuation should be deferred until after the fifth day, care being taken not to open the general peritoneal cavity. But if in doubt whether to wait, the pus may be directly evacuated. If the appendix present in the wound it should be removed, but no elaborate search should be made for it. It may be removed later on.
5. In general suppurative peritonitis the use of drainage, massive infusions, and calomel.

REFERENCES.

- ¹ BRITISH MEDICAL JOURNAL, June 28th, 1902. ² Ibid.

ONE YEAR'S WORK IN ACUTE APPENDICITIS.*

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DURING the year 1906 it fell to my lot to operate upon 47 cases of appendicitis at some period of the acute stage of an attack, and in order to conveniently study the results obtained I have classified them into four groups:

1. "Early" cases, where the infection was found at the operation to be still limited to the appendix, there being as yet no evidence of peritonitis.
2. "Abscess" cases, where an abscess was present, more or less securely shut off by localized peritonitis from the rest of the peritoneal cavity.
3. "Diffuse spreading" peritonitis, where the peritoneum was becoming rapidly and progressively infected, without any attempt at limitation of the process.
4. "General" peritonitis, where at the operation it was actually seen that the peritonitis extended everywhere, from the pelvis to the diaphragm. The difference between

the two last groups is merely one of extent of peritoneum involved, and many would include them together under the term "general" in contrast to "local" peritonitis. To do so, however, gives a wrong impression as to the recoverability of general peritonitis, for in many of these cases the infection, though rapidly spreading and tending to become general if left alone, yet has not actually done so at the time of operation, and, in fact, may by means of the operation be prevented from so doing. Truly general peritonitis is very rarely recovered from, and can be diagnosed with certainty only when, at the operation, the infection is actually seen to extend from pelvis to diaphragm.

	Cases.	Deaths.	Mortality.
Group 1. Early cases	6	0	—
" 2. Abscess cases	19	2	10.5 per cent.
" 3. Diffuse spreading peritonitis	19	0	—
" 4. General peritonitis	3	2	66.6 per cent.
Total	47	4	8.5 per cent.

This total mortality of 8.5 per cent. compares very favourably with what I have obtained in previous years (17.6 per cent. over a series of 26 cases in 1905, and 22.8 per cent. over 21 cases in 1904), and it is to be attributed to the undoubted tendency on the part of the medical practitioner to call in a surgeon at an earlier stage than hitherto. The 4 deaths that have occurred (2 in abscess cases and 2 in general peritonitis) cannot reasonably be attributed to the operation *per se*, but are unquestionably the result of the operation being delayed too long.

"Early" Cases.—Appendicitis is undoubtedly at first a purely local disease; it is absolutely limited to the appendix. The time which elapses before the infection spreads to the peritoneum varies in different cases, and hence the limit of forty-eight hours, as usually given, is not to be taken as absolute, but merely as a rough guide. I have found peritoneal infection as early as eighteen hours after the onset of the attack, and, on the other hand, have on the fourth day found a gangrenous appendix without any evidence of peritoneal reaction. If the appendix is removed at this localized stage the process is cut short, and all the possible dangerous consequences of delay avoided. Operation at this period is as safe as an "interval" operation—that is, it has a mortality which is practically negligible; it is, moreover, easier of performance, since there are no firm adhesions such as are frequently found at an operation during the quiescent period. The convalescence is short, drainage, even if necessary, is only so for a few days, and the risk of subsequent weakness of the scar is extremely slight.

In the early stages of an attack of appendicitis there are no signs by which we can foretell with any degree of confidence whether the infection will remain limited to the appendix and so subside without operation, or whether it will spread to the peritoneum and operation subsequently become inevitable. In many cases, by the time it is certain that it is spreading and *will* necessitate operation it is only too evident that the chances of recovery are against the patient. The ideal measure is to remove the appendix while the infection is as yet limited to it, at a time when recovery can practically be guaranteed.

Of the objections that have been put forward to the routine adoption of early operation in acute appendicitis the most important are: (1) The high mortality after operations performed in the acute stage. Taking all cases together, the mortality at the present time is undoubtedly high, not, I maintain, on account of the operation *per se*, but because of the toxic condition into which the patient has been allowed to drift before operation is undertaken. In no class of case is it more important to distinguish carefully between deaths *after* operation and deaths *from* the operation. The correct deduction from the present high mortality after operations in the acute stage of appendicitis is to have them performed before the patient reaches such a state of toxæmia that he will die *in spite of* and not *on account of* operation. Such deaths can, with far greater justice, be ascribed to medical rather than surgical treatment, inasmuch as reliance upon medical measures has been the

* Portion of a paper read before the Darwen Medical Society, February 21st, 1907.