A Clinical Lecture
ON
WHEN TO OPERATE FOR APPENDICITIS.*

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IT is certain that a great many people die of appendicitis who could be saved by timely operation, and that we in England err on the side of conservatism, whereas it is probably true that some American surgeons go to the other extreme. What a pity that we cannot lay down absolute rules which would always guide us to take the right course; but in this, as in other branches of surgery, no such laws can be made because of a variety of circumstances. Diagnosis is difficult; patients may grin and bear in silence, or refuse to be guided, and a skilful surgeon may not be available at short notice. In this lecture I propose to give my own opinions, formed after some years' experience.

A.—AFTER ONE ATTACK.

Most physicians and surgeons are now of opinion that it is wise to remove the appendix after one attack of appendicitis. It is certainly true that one attack does not usually protect against another; it nearly always predisposes. Moreover, it is never certain that a second or subsequent attack may be trivial like the first. The evidence goes to show that succeeding attacks increase in severity. This is only what one would expect from the mechanical changes occurring in the appendix during each attack. It is a mistake to suppose that the patient who has had one severe attack of appendicitis is not likely to develop peritonitis in the second. Adhesions rarely shut off the whole of the appendix from the peritoneal cavity, and often enough they entirely disappear, so that the appendix may lie free in the abdominal cavity a month after a severe attack. This is often seen at an interval operation. If one goes into the history of any patient who comes into "clinical" with spreading peritonitis due to appendicitis, one usually finds that he has already had several milder attacks. It is true, of course, that in some cases the first attack is grave and rapidly leads to spreading peritonitis. Remembering these facts, it seems to be foolish to wait for a second attack before operating. It is far better to get rid of the appendix and be on the safe side. To wait for a second attack, with the idea of operating very early in the attack, seems to me to be wrong, because no one can ever foretell the circumstances under which the second attack may arise. It may be impossible to operate early enough to make the operation as safe as one undertaken in the quiescent period. The best time for operation is about three weeks after an attack, when the inflammatory adhesions have absorbed and the intestines have assumed their normal condition, and before another attack is likely to develop. While waiting for operation the patient should avoid all but the gentlest exercise. The operation undertaken within a few days of an attack may be attended with considerable difficulty on account of inflammatory adhesions, haemorrhage, and possible pockets of pus, so that drainage may have to be established in some cases, with the attendant risk of hernia. Some attacks never do subside, but become subacute. In these there is usually a little pyrexia and some local induration, due to the presence of a small abscess with thick walls. There is nothing to gain by waiting in these cases, and much to lose from the risk of general infection.

B.—EARLY IN THE ATTACK.

I hold very strongly that it is wise to operate, whenever practicable, as soon as the diagnosis of appendicitis is made, and, if possible, within twelve hours of the commencement of the attack. This is the only way to avoid dangerous and troublesome complications. Moreover, this saves the patient a great deal of time and money, and relieves the medical attendant of much anxiety. At this early stage the operation is very easy because of the absence of adhesions, and it is almost, if not quite, as safe as an "interval" operation. Appendicitis is only dangerous when the inflammation is allowed to spread beyond the appendix, and gives rise to complications which of necessity take some time to develop, and are preventable. Various authorities give the mortality of appendicitis as from 14 to 20 per cent. This ought to be capable of reduction to less than 1 per cent. by operating at the earliest possible moment, as shown by experience and an increasing volume of evidence. I have not lost a single patient operated upon within twenty-four hours. In many cases perforated duodenal or pyloric ulcer, inflammation of Meckel's diverticulum, and suppuration of the gall bladder have been mistaken for appendicitis, and the resulting delay in treatment under the conservative régime has usually been serious. Early exploration enables the surgeon to discover his error and to treat these grave conditions while they are in a hopeful stage.

Dangerous Complications.

Some attention may now be given to some of the dangerous complications which are mostly avoidable by early operation.

1. *Spreading Peritonitis.*—Frequently during an early operation, a gangrenous distended, but still shiny, appendix is discovered ready to perforate at any moment. No one can say, with any pretence of accuracy, what the condition of the appendix may be until the abdomen is opened, and to wait in many cases is bound to be disastrous. He who dares to guess the end of an attack of appendicitis assumes the power of prophecy. Moreover, with our improved methods of treatment, even peritonitis, *if treated early enough*, does not possess its ancient peril. Nothing has surprised me so much as the way in which patients with early peritonitis make a complete recovery after the modern operation. Thirteen years ago, when I was a "clinical" at Guy's, all cases of peritonitis coming into "clinical" during three months died. Now quite 75 per cent. get better, partly because they are admitted earlier, but chiefly because, with increasing knowledge, they are treated better (vide infra).

2. *Localized Abscess.*—A localized abscess due to appendicitis carries with it a risk of death of about 15 per cent. It is much better to operate before an abscess can have time to develop. I am well aware that it is not always possible, because patients occasionally present themselves for the first time when an abscess is already formed. There are instances of subacute attacks in which patients may continue at work until the symptoms and signs of an abscess may develop. The dangers of an appendicular abscess are chiefly due to its liability to rupture into the peritoneum, causing spreading peritonitis. Many of the cases of peritonitis are of this secondary type. During the operation for appendicular abscess it is easy to notice how frail the adhesions are that separate the abscess from the abdominal cavity, so that any unusual exertion, or the natural increase of tension, may lead to rupture into the peritoneal cavity at any moment. In more fortunate cases the abscess may burst into the intestine, and the patient may often get well soon after this; but it is a mistake to think that such a patient is not liable to future attacks. An abscess may burst into the urinary organs, possibly leading to cystitis and ascending suppurative nephritis. An abscess may form in the pelvis and lead to permanent damage to the important structures placed there. Residual abscesses may form at some distance, such as subdiaphragmatic abscess, which is still attended by a high mortality.

3. *Empyema and other Pulmonary Complications.*—There is little room for doubt that infections of the lungs and pleura are mostly embolic, and that the liability to them increases with the duration of the appendicitis. It is a fact that these complications, and especially subdiaphragmatic abscess, are far less common in patients treated by early operation. It stands to reason that with the continued presence in the abdomen of an inflamed appendix with infected blood vessels in communication with the portal vein, portal pyaemia is much more likely to occur than if the appendix is removed at once. Moreover, the presence of a suppurating appendix is a constant risk of general pyaemia.

4. *Intestinal Complications.*—Intestinal adhesions with secondary intestinal obstructions and also faecal fistulae

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are far more likely to develop in neglected cases. Moreover there is some evidence to show that chronic constipation in many cases dates from a severe attack of appendicitis, followed by contracting adhesions.

5. *Hernia.*—By operating very early the abdomen can be completely closed in the majority of cases without endangering the life of the patient. Thus the risk of hernia is minimized. These early cases are in striking contrast with those in which one is driven to operate late in an attack of spreading peritonitis or large abscess, when it is necessary to drain the abdomen for a few days at least.

C.—Cases not seen Early in the Attack.

It must be allowed that, although an operation at the earliest possible moment is the safest and best treatment for appendicitis, it is often impossible to get this done, for various reasons. Poor patients often do not ask their doctor to see them until they are getting seriously ill, and have tried in vain all their homely remedies, more especially a variety of purgatives. A skilful surgeon may not be available, the diagnosis may be very doubtful, or a patient may at first refuse operation. If the advantages of early operation were properly appreciated by those concerned it is certain that there would be less delay than there often is at the present time. The public, and even the medical profession, have still much to learn in this direction.

In such cases, seen after the most favourable time for operation has been allowed to pass, it is a difficult matter to decide for or against immediate operation. If the signs and symptoms are subsiding, it may seem wise to postpone the operation until about three weeks after the attack; but it must be remembered that appendicitis is a treacherous disease which is liable to take a bad turn at any moment, and that the patient is never safe until the appendix is removed, so that if surgical aid is not available at short notice, it is safer to operate at the first opportunity. The risk of operation in such cases is small, whereas the risk of leaving alone is uncertain. Under more favourable circumstances, such as exist in the wards of a hospital, where an operation can be performed at any moment, the risk of waiting for the quiescent period is smaller, and may seem to be justified by the low mortality of the interval operation. But in some apparently mild cases in which this course is adopted an abscess develops at any time within about fifteen days of the onset of the attack, often after all danger is supposed to be over. Then an operation has to be undertaken under less favourable circumstances than at an earlier stage. The risks of complications and of death are increased, and the difficulty of removing the appendix is greater on account of denser adhesions between vital structures and the presence of pus. Drainage is usually necessary, and a ventral hernia is apt to follow.

In those cases in which an abscess would not otherwise develop, I do not believe that an operation at any stage of the disease increases the danger. The risk of causing a localized peritonitis to become diffuse is a very small one if proper precautions be taken to prevent it. The same is true of infection and suppuration of the abdominal wall. It is assumed, of course, that the surgeon is experienced and skilful in abdominal surgery, for what may be a safe course for one surgeon may be dangerous to advise for another. In any case, waiting involves waste of time, money, and anxiety. For these reasons I believe it is wise to recommend operation without delay in all cases of appendicitis when the circumstances are favourable, and a capable and experienced surgeon is available for what may prove to be a difficult operation. I believe that a careful operation reduces the dangers of the disease at all stages. Every surgeon knows that it is practically impossible in many cases to estimate the gravity of the patient's peril before the abdomen is opened. The duration of the disease is of little value, although it has been relied upon. The symptoms and even the signs are often deceptive. A wise and conservative physician told me that he had painfully and slowly come to the conclusion that immediate operation is the best treatment for appendicitis, at whatever stage the patient is first seen. However, different opinions prevail concerning the treatment of cases in which the patient is not getting worse, or the disease seems to be subsiding. When the signs and symptoms are getting progressively worse or fail to subside in due course, it is imperative to operate without delay in order to save life. This is not the time to dwell upon the troublesome sequelae of late operation. It is important to mention some of the most reliable signs and symptoms which indicate that the patient is getting worse, and that an operation is urgently required.

Signs and Symptoms.

1. Increasing rigidity, tenderness, and fixation of the abdominal wall. When these conditions are localized to the right iliac fossa, they usually indicate a localized abscess, but when they are spreading they indicate a spreading peritonitis.
2. Persistence of pain and vomiting.
3. Accelerating pulse-rate.
4. Rapidly rising or falling temperature, especially associated with shivering; these indicate a rapid spread of the disease, and often follow the discharge of pus into the peritoneal cavity.
5. Shifting dullness in the flanks, indicating the presence of free fluid in the abdomen, generally due to spreading peritonitis, although there may be free fluid complicating a local abscess.
6. The presence of a tender, dull swelling in the iliac fossa, loin, or pelvis, the latter being discovered by bimanual examination.
7. Leucocytosis, especially a rise in the proportion of polymorphonuclear cells.
8. Flushing of the face.

These indicate localized abscess. When the abscess is unusually high the appendix is retro-caecal or the caecum has failed to descend naturally. When it is situated in the pelvis the appendix is hanging over the brim. The pelvic abscess is often indicated by frequent and painful micturition, rectal tenesmus, and diarrhoea. It may not be possible to feel the localized swelling until the abdominal muscles are relaxed by an anaesthetic. The swelling may be resonant, especially in late cases, from the presence of gas in the abscess.

9. Rapid wasting.
10. Profuse sweating, often associated with rigors.

These indicate spreading infection and suppuration.

The peritonitis is getting grave when distension of the abdomen and tympanites begin; but operation should not be deferred so long. It is not wise to wait for fluctuation, redness, or oedema before opening a localized abscess, because of the grave danger of peritoneal and vascular infection.

It may be repeated that an exploration is the only reliable means of ascertaining the nature and extent of the abdominal disease, the signs and symptoms being notoriously inadequate.

Conclusions.

1. It is wise to remove the appendix in the quiescent period after one definite attack of appendicitis.
2. The best treatment of acute appendicitis is an operation at the earliest possible moment, if a good surgeon is available.

Since this lecture was sent to press my late dresser, Mr. Mutch, has collected and analysed the results of a large number of cases treated at Guy's Hospital. His paper will be read before the Guy's Physical Society shortly. He has kindly given me some of his figures and conclusions, which strongly support my remarks upon the wisdom and safety of early operation.

The next examination for the award of the Smith Turner Scholarship in Dental Mechanics—annual value £30—founded by the British Dental Association in 1907 to honour the memory of James Smith Turner, will be held on April 15th, 1910. The scholarship is open to any registered dental student who, in the opinion of the committee, has financial difficulty in completing the dental curriculum. The examination in dental mechanics is both practical and viva voce. The scholarship is tenable for one or two years, at the discretion of the committee, and is paid to any dental school in discharge of fees. Applications must be received on or before April 1st, addressed to the Honorary Secretary, British Dental Association, 19, Harover Square, London, W.