treatment, phrenic evulsion being necessary to avoid too much traction of the heart and mediastinum to the affected side. The only evident effect in these cases was an apparently good one in the lengthening of the intervals between refills. All the patients are free from symptoms, have no sputum, and are fit for work.

Within an average period of ten weeks from the date of the appearance of fluid six cases showed evidence of a spread of disease; in five this was in the opposite lung, in the sixth it was in the larynx. Two of the five with lung disease had pneumothorax induced in the other lung, and while one of these is still sputum-positive, the other is sputum-free and fit for work; two more are alive, but sputum-positive and in poor condition; and one is dead. The patient who developed laryngeal tubercle was healed of this complication by galvano-cautery, but never became tubercle-free; phrenic evulsion was performed, but the patient refused thoracoplasty. Two of these six cases had gas replacements.

Fifteen cases obliterated—that is, at varying periods from the date of the onset of fluid it was no longer possible to continue refills as the pneumothorax cavity closed by spreading adhesion of the pleural surfaces. In three of these the obliteration was rapid, within at most three months from the appearance of fluid. All three showed rapid extension of disease on the opposite side, and all three are dead; two, however, were already bilateral at the time of induction, and had laryngeal tuberculosis, so that the treatment was instituted more as a palliative than as a curative agent.

Twelve cases obliterated without evidence of spread of disease to the other side. Eight of these patients have remained soundly healed without further treatment, and are fit for work, while a ninth is also in this condition after phrenic evulsion, which was performed as there were signs of activity when the lung re-expanded. The remaining three again became sputum-positive. One of these refused further treatment; her general condition has been good for six years. The other two became acutely ill, and were advised to have thoracoplasty, and while one died following the first stage of the operation, the other has remained sputum-free and in good condition for two years. Six of these fifteen cases required gas replacements.

Tuberculous pyopneumothorax developed in five cases. Four of these patients are dead; the immediate cause in three was tuberculous meningitis, and in the fourth it was frontal lobe abscess. The fifth developed the complication following a superimposed spontaneous pneumothorax at a period when he required several gas replacements; in 1932 he had a three-stage thoracoplasty, and while he is still sputum-positive his general condition is fair.

CONCLUSIONS

Thirty-one of forty patients are alive at intervals of three to nine years from the date of appearance of fluid, and twenty-five of these are sputum-free or sputum-negative. Nine patients are dead—three from acute spread following obliteration (two were already bilateral at the time of induction), one from acute disease in the opposite side soon after the appearance of the fluid, one from re-exacerbation in the same lung, and four from tuberculous pyopneumothorax.

Gas replacement would seem to have no definite bearing on the after-history for good or bad results. Tuberculous pyopneumothorax is a serious complication, but where this does not develop fluid has seldom a bad effect on the ultimate result of artificial pneumothorax.

[It is hoped that a paper to show comparative results in those cases that did not develop fluid and in "control" cases where pneumothorax failed for various reasons will be ready for publication in the next few weeks.—R. R. T.]

CHRONIC APPENDICITIS*

BY

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In the great majority of cases acute inflammatory lesions of the appendix give a fairly clear group of signs and symptoms, not all of them being present in each case, which enables a diagnosis to be made—stomach-ache starting all over the abdomen, or in the epigastrium, or umbilical area, which, after a varying length of time, radiates to the right iliac fossa; nausea or vomiting; probably some rise in temperature and pulse rate; tenderness in the right iliac fossa or near neighbourhood; and perhaps rigidity and alteration of the cutaneous sensation and abdominal reflexes.

Chronic appendicitis does not, as a rule, give rise to signs and symptoms so definite that they can be considered characteristic of this condition, and of this condition only, and it is frequently only by a process of exclusion that a diagnosis of chronic appendicitis can be entertained as the most probable cause of the signs and symptoms. These, I think, may be classified into four groups, but it must be remembered that the mental reaction of patients to an inflammatory lesion differs very greatly, so that the same apparent degree and intensity of inflammation in two patients may evoke descriptions of pain and symptoms which are quite different, and will also affect their conduct during the process of their illness—one may feel compelled to go to bed and call in his doctor, the other may carry on his work and not take much notice of the upset. The result, then, is that the term "chronic appendicitis" must be of rather an arbitrary nature, depending on the duration of the patient's symptoms, his description of and reaction to them, as well as on the appearance of the suspected area at the time of operation, along with the macroscopic and microscopical changes seen in the appendix.

The chronic inflammation may follow an attack of acute appendicitis, or the condition may be chronic throughout. An acute attack may supervene on the chronic and simplify diagnosis.

The four groups I should suggest are:

1. With signs and symptoms of a very mild nature, resembling those already described for acute appendicitis.
2. Appendicular dyspepsia.
3. Lower abdominal pain.
4. Without symptoms or signs.

Group 1.—It is in patients of this group that the diagnosis of chronic appendicitis is rather arbitrary. The signs and symptoms are of a very mild nature, but are fairly characteristic—pain starting all over the abdomen and radiating to the right iliac fossa, where there is tenderness and perhaps rigidity. These attacks (of varying duration) may have recurred over a prolonged period, without having interfered with the patient's employment, and without having had any obvious effect on his general health. Between attacks the patient may enjoy normal health, and operation may show no macroscopic abnormality in the appendix or its area, or there may be adhesions; but microscopically the appendix shows changes of a fibrotic nature in the submucous coat, with round-cell infiltration of all coats, or its lumen may be occluded and replaced by fibrous tissue.

Group 2.—Indigestion of appendicular origin may simulate very closely that due to peptic ulceration of the stomach or duodenum, or that of cholecystitis. It may follow on an attack of acute appendicitis which has subsided, or the inflammatory lesion of the appendix may be chronic from the start. The similarity of the symptoms of these conditions may be very close, both in periodicity and in type—indigestion occurring in bouts lasting from twenty-four hours to two weeks or longer, with periods of almost complete freedom up

* Read to the Willesden Division of the British Medical Association, November, 1933.

to six months, the pain being in the epigastrium, possibly severe, coming on half an hour to two hours after food, often waking the patient at night, and there being possibly vomiting, which causes relief, as do eructations—and the diagnosis may not be settled by *x*-ray or chemical examinations, so that an exploratory operation has to be undertaken before the appendix is removed. In other cases the appendix may give clearer indications that it is the cause of the trouble, and whether it is removed through an incision in the right iliac fossa or after an exploratory operation will depend on the choice of the surgeon. The appendix on microscopical examination will show fibrotic changes of varying degree. Removal of the appendix in such cases is not followed by immediate and complete disappearance of the patient's signs and symptoms. These gradually disappear, and the patient returns to normal health. If, however, the chronic inflammatory lesion has been present for a prolonged period, organic changes may have taken place in the upper abdomen, and the treatment of these lesions will complicate the recovery. In my experience this condition is not a common one, but the difficulty of diagnosis between a peptic ulcer and a chronic appendix may, if *x*-ray appearance after an opaque meal is inferential only, lead to wrong diagnosis of some cases, and unless operation is performed in every case, some patients with appendicular dyspepsia may be thought to have ulcer and be treated accordingly, till such time as a flare-up in the inflammatory lesion leads to a correct diagnosis.

Group 3.—Lower abdominal pain—the pain is of very varying severity; it is sometimes described as a dull ache, or a feeling of burning, a feeling of fullness, like a knife sticking in the part. It may be of daily occurrence, or it may come on at irregular intervals; it may be influenced by food, being made worse half an hour to two hours after meals, or it may be quite unaffected by the taking of food; it may be made worse by walking. The pain may be in the umbilical area or in the hypogastrium (occasionally in the epigastrium), with perhaps stabbing pain in the right iliac fossa, or the pain may be confined to this region. It may have been experienced for months or years, with or without nausea, and may not have interfered with the patient's employment, or, so far as can be judged, with his general health. As a rule there is tenderness in the right iliac fossa. At operation the area round the appendix may appear normal, or there may be adhesions of an inflammatory character so dense that the removal of the appendix is very difficult. Macroscopically, by surface appearance, the appendix may look normal, or may show signs of pathological change, while microscopically any degree of fibrosis and round-cell infiltration is present.

Group 4.—It frequently happens that a pathological appendix is removed during the course of an operation which is being done for some other condition, and yet there is no history suggesting any inflammatory lesion of the appendix. This might be on account of confusion of the symptoms between the two conditions, or it may be that the chronic inflammation of the appendix gave rise to no symptoms; but it is quite possible that the appendicular lesion has had some influence on the development of the diseased condition, if the latter is in the upper abdomen. It is quite common for an attack of acute appendicitis to settle down, leaving no evident trace of a pathological condition, for years perhaps, and if the appendix is removed in a subsequent attack, to find, in addition to signs of acute inflammation in it, fibrosis and obliteration of the lumen of the distal part, perhaps with dense adhesions to surrounding structures. This fibrosed part may be evidence of a healed lesion, or it may be considered as a chronic inflammation which has not given rise to signs or symptoms, although the results of its presence may not be evident at the time, but may develop later.

DIFFERENTIAL DIAGNOSIS

1. *Gastric and Duodenal Ulcer.*—*X*-ray appearance of the stomach after a barium meal may in many cases give definite indications of the presence of these ulcers, but, where the evidence is inferential only, the diagnosis is still in doubt. The *x*-ray appearances of a chronic appendix lesion have been much discussed, and many points have been stressed as peculiar to it, such as tenderness on pressure of the visualized appendix, delay in emptying, persistent kink, bulbous tip, and many others,

but there does not seem to be unanimity among radiologists as to the interpretation of these signs, and disappointment with the results of appendicectomy following *x*-ray diagnosis has been fairly frequent. In the absence of positive findings, therefore, exploratory operation is the only choice left.

2. *Visceroptosis.*—In patients with this condition—and they are usually females—the attacks of pain have been frequent since the age of 15 years. They are variously described, and are always in the right iliac fossa. Patients may feel sick, and discontinuance of work—that is, from the severity of the attacks—depends greatly on the mentality of the patient. The thoracic outlet is very narrow, and the pelvis seems correspondingly broad. There may be some hyperaesthesia to the right of the umbilicus, and constipation is common. Patients say they are tender in the right iliac fossa, and their conduct towards pressure in that region is some indication of their mental reaction—some will just complain of the pressure, while others will squirm about or even jump off the couch. The caecum may be felt to be mobile and large. This is the type of patient whose signs and symptoms are made much worse if appendicectomy should be done. At operation the caecum is found to be large and mobile, of a greyish blue colour, and with walls slightly thickened, and the appendix shows no changes of an inflammatory character. Removal of the appendix in these patients for such signs and symptoms as have been described leaves the patient no better off, and is frequently the starting-point of further invalidism. Some time ago I examined some of these cases by *x* rays after a barium meal, and by pyelography, but, apart from the low and mobile condition of the caecum, no other abnormality was seen. It is possible that in a few such patients partial torsion of the caecum may account for the symptoms, but if this was the true explanation one would expect volvulus of the caecum to be commoner than it is; the conditions of volvulus are there, but, in my experience, this is a very uncommon cause of intestinal obstruction.

3. *Renal and Ureteric Conditions.*—Right-sided manifestations of these conditions must be excluded before a diagnosis of chronic appendicitis is made. In those which give signs and symptoms of a chronic nature the similarity between the two conditions may be great, but as a rule there is some indication of the origin, and investigation will clear up the diagnosis. Chronic pyelitis may cause pain in the right side of the lower abdomen, but there is frequently tenderness over the kidney, and a catheter specimen of urine will show the presence of abnormality. Hydronephrosis of slight degree causes discomfort in the right side of the abdomen, but this is frequently relieved by rest, and pyelography at once demonstrates the pathological condition. A ureteric stone of sufficient size to remain in the ureter may give signs and symptoms of a chronic nature in the lower abdomen—the pain may be intermittent in character, and may seem to be affected by the taking of food. *X* rays and the passage of an opaque catheter up the ureter will reveal the stone and its site, and the appropriate treatment can be carried out. The passage of a small stone down the ureter gives rise to acute symptoms which may simulate those of acute appendicitis.

4. *Pathological conditions of the tubes and ovaries* usually give physical signs which distinguish them from chronic appendicitis. There is a type of case in which pain in the right iliac fossa begins at the time of the menstrual periods and recurs with each period, yet in which the uterus, etc., are said to be normal. I have not found sufficient indication of appendicular mischief in these cases to justify operation.

5. *Adenitis in the mesentery* near the ileo-caecal angle may cause signs which can be confused with those of acute

appendicitis, but the more chronic variety—usually tuberculous—may cause symptoms less acute in character and spread over a longer time, so that confusion may arise, and it may not be possible to differentiate between the two conditions without operation. The adenitis may heal without having caused any symptoms, and may be discovered accidentally, as in a little girl operated on some time ago for recurrent appendicitis in whom, in addition to the appendicular lesion, were found a healed glandular lesion of the mesentery, an enteric intussusception, a Meckel's diverticulum, and a cystic right ovary.

6. *Foreign bodies*, such as shot, can lodge in the appendix, and are probably the cause of the pain and discomfort described. They can be seen by *x* rays; worms have also been found in the appendix at operation undertaken for similar symptoms. Stercoliths of large size may be associated with signs and symptoms of a chronic nature, but I have found them more frequently in acute cases, where they must, judging by their size, have been lodged for some time; and yet no history of any abnormality in the abdomen could be obtained from the patients till the acute attack started.

7. *Spinal and nerve conditions*—such as arthritis of the spine, psoas abscess—may cause pain in the right iliac fossa, but examination of the vertebral column should obviate error. Tabes should be ruled out as a routine measure.

8. *Carcinoma near the ileo-caecal junction* causes pain of a colicky character in the lower abdomen and right iliac fossa, but the age of the patient at the onset of the first symptom, the nature of the pain, and an investigation by barium enema may point to the diagnosis. If the diagnosis is in doubt, exploratory operation should be carried out without delay. Carcinoma of the appendix, or "carcinoid," has been found in a number of cases in which there were complaints of pain, etc., in the lower abdomen and the right iliac fossa. It is a rare condition: I have only had one case, and have unfortunately lost touch with it, so that I do not know whether the patient has improved as the result of appendicectomy. These cases usually run a simple course, but several instances are reported of secondary growths in the liver.

9. *Incipient hernia* in the right inguinal canal may cause pain in that region, and this may be confused with the pain of a chronic appendix.

DISCUSSION

My experience leads me to believe that the condition of chronic appendicitis does exist, and that it may follow an acute attack, or may not have an acute onset, but run a chronic course. It is not, however, a common condition, and its lack of definition in the clinical features makes me approach its diagnosis with caution, and take steps, where they are necessary, to exclude other lesions before reaching a conclusion. The history and general clinical examination are, I think, most important. The younger the patient the more probable it is that the appendix, if at fault, is the cause of his symptoms, and its removal will bring about restoration of function. In such cases I think incision through the right iliac fossa is justifiable and proper, and that an exploratory incision should not be used. For older patients, unless the diagnosis is almost certain, exploratory operation is probably better than the more limited operation.

If the appendix only is at fault, the operation results are good, and the patients soon return to normal health. Removal of the appendix for a lesion which is situated elsewhere can only bring the operation into disrepute, and the fact that such patients are secure from acute appendicitis in the future does not justify the procedure unless it is done specifically for that purpose.

There is great controversy as to whether a condition of chronic appendicitis does occur. The normal histology of the organ is also subject to discussion and varying opinions. It is said that as age advances, fibrosis takes place as a normal process, and that this is in no way connected with a chronic inflammation. Some pathologists agree that occlusion of the lumen by fibrous tissue and fibrosis of the walls point to chronic inflammation, while others state that these are only the usual processes of repair, and deny that there is a pathological basis for the diagnosis of chronic appendicitis. Others, again, say the fibrosis is due to disease of the sympathetic ganglia and Meissner's ganglia, and attribute the poor results which frequently follow appendicectomy to this condition. Radiologists are as variable in their views as pathologists, and there does not seem to be sufficient unity of opinion from *x*-ray examination to make the investigation a dependable diagnostic procedure. Surgeons, too, are not lacking in differences of opinion. Some say the condition must start with an acute attack, while others hold that it may be "chronic" from the beginning; still others deny its existence as a clinical entity. Many points of tenderness have been described, and many tests tried, but there is no general acceptance of them as cardinal signs of the condition.

SUMMARY

1. Chronic appendicitis may follow an acute attack, or it may have a gradual onset and run its course without any acute signs.
2. It is not a common condition, and the lack of a clear clinical picture makes its diagnosis dependent on the exclusion of other lesions.
3. Removal of an appendix, the seat of chronic inflammation, cures the patient, if it is the only lesion present.
4. The longer such an appendicular lesion is left unattended, the more probable is it that other lesions may develop, especially in the upper abdomen.

THE ANAPHYLACTIC BASIS OF RHEUMATISM

BY

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This paper is an attempt to survey the possible connexion between rheumatism and anaphylaxis, a phase of immunity in which, as Besredka has said, all the rules of immunity are made to stand upon their heads. The aetiology of the rheumatic group of diseases is now entering upon a fresh phase, and the fact is at last receiving common recognition that streptococci have a causal relation to the group. The bacteriological and immunological problems involved have not been understood by many clinicians, but it is unnecessary to direct attention to some of the absurdities produced. The present position is that streptococci and possibly other organisms are causally related, but that the relation is not of the simple order that would satisfy Koch's postulates.

THE ORGANISM

Skin tests have been made by many observers, and there is fairly good agreement that most patients are allergic to the streptococcal group. There is no satisfactory evidence that a specific organism is responsible, and Topley and Weir (1921) have shown that similar lesions can be produced in rabbits by a variety of streptococci. Wright (1926) caused endocarditis in rabbits