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SOME POINTS IN THE PATHOLOGY OF APPENDICITIS

ILLUSTRATED BY SIX MICRO-PHOTOGRAPHS

BY

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Surgeon City of London Truss Society, &c.*

[Reprinted from "West London Medical Journal," January, 1902]



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ON SOME POINTS IN THE
Pathology and Morbid Anatomy of
Appendicitis.¹

BY W. McADAM ECCLES, M.S., F.R.C.S.

*Senior Assistant Surgeon to the West London Hospital; Assistant
Surgeon to the City of London Truss Society, &c.*

I AM proposing to place before you to-night a few of the facts which I have learned from the microscopical study of sections obtained from some of the appendices which I have recently had occasion to excise.²

Before passing to the pathology, perhaps a few words on the normal anatomy of the appendix may not be amiss. Like other parts of the alimentary tract, the wall of this portion consists of three main coats, an external serous, a middle muscular and an internal mucous; but in connection with inflammation of the tube, attention has to be drawn especially to the large lymphoid follicles contained in the submucous tissue, and also to the arrangement of the lymphatic spaces and vessels so clearly pointed out by Lockwood and others.

A section across the whole appendix viewed under a low

¹ A paper read before the West London Medico-Chirurgical Society on November 1, 1901.

² I have to thank Mr. E. H. Shaw, of St. Bartholomew's Hospital, for his skill in the preparation of these sections.

power shows a mucous membrane containing glands similar to those known as the solitary glands and the glands of Lieberkühn found in the large intestine. Beneath the mucous membrane proper, and particularly in the appendices of young subjects, the lymphoid follicles are peculiarly well-marked. In adult life, and especially after 40 years of age, they become less pronounced, and even disappear. The muscular coat consists of two layers; an inner comparatively thick layer of circular fibres, and an outer, less marked, of longitudinal. Here and there, there will appear a break in these muscular elements through which the lymphatic vessels pass to become continuous with those found in the loose areolar tissue beneath the serous coat. It would seem to be very natural that bacterial infection should pass along these tracts from the interior of the appendix to the superjacent peritoneum. Bearing in mind this brief survey of the microscopical anatomy of the appendix I would ask your attention to some changes which occur as the result of the activity of micro-organisms within the lumen of the tube.

It is not my intention to discuss the etiology of appendicitis, but merely to show you by actual sections the effects of such inflammation. The sections which I throw on the screen are those obtained from three conditions typical of inflammation of the appendix or its results.

The first is an appendix under very low power to show the presence of an enterolith or faecal concretion (fig. 1). The section of the appendix has been cut with the calculus left *in situ*. It was removed from a gentleman, 31 years of age (sent to me by Dr. Stanley Smith), who had had three slight attacks not altogether typical of appendicitis but indicating sufficiently that this organ was at fault. The appendix was found, three and a half inches long, lying almost transversely

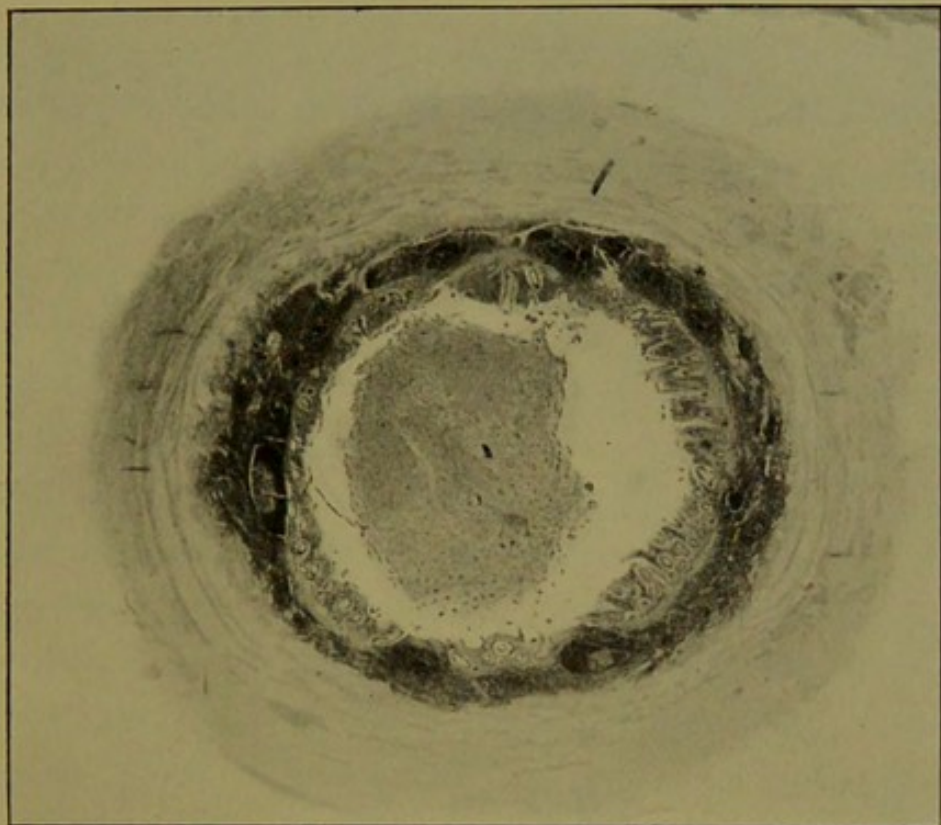


FIG. 1.—Section of appendix with calculus in situ. ($\times 50$).

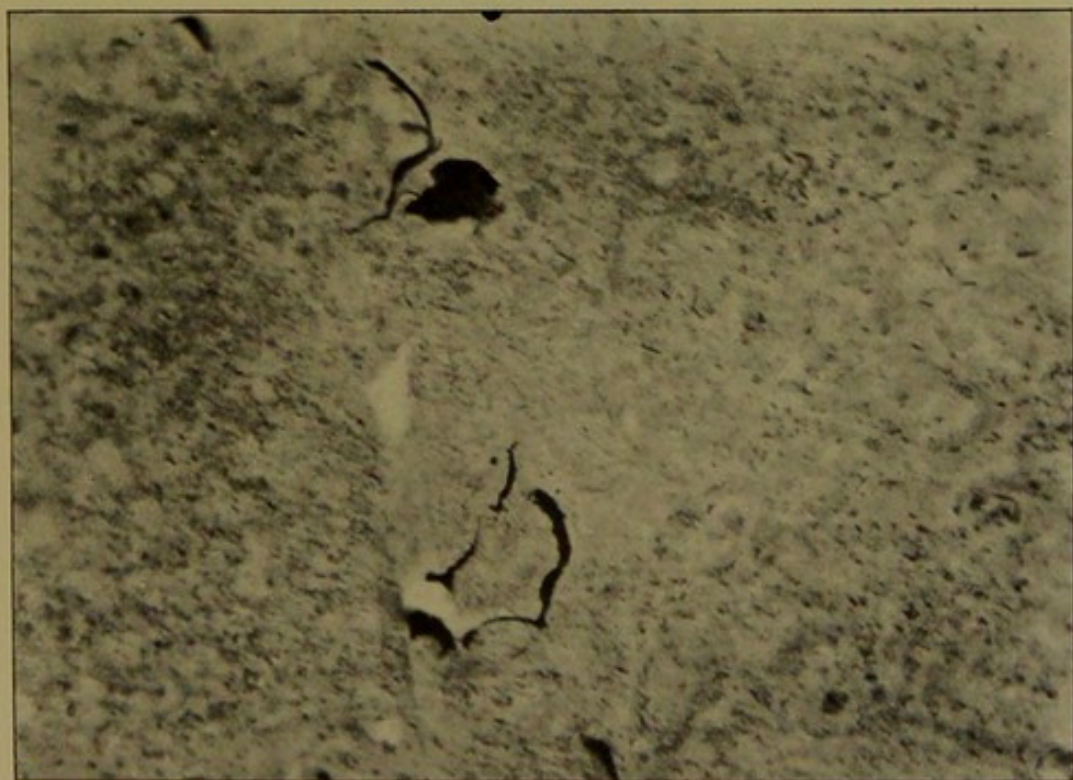


FIG. 2.—Appendicular calculus, showing colon bacilli. ($\frac{1}{12}$ oil immersion).



inwards and bound down by some slight adhesions. Its last half inch was sharply flexed. Within it could be felt, about two inches from the cæcum, a small oval concretion. The appendix was hardened in Müller's fluid, and complete transverse sections cut through the part containing the calculus. This will be seen to fill the greater part of the lumen of the tube, and it will be noticed that there is a considerable increase in small cell infiltration in that part of the submucosa which is opposite the enterolith, and that the lymphatic spaces in this region appear to be distinctly enlarged; thus showing, I think, the effect of the irritation of the calculus upon the inner coat of the appendix.

I next exhibit a portion of this concretion appropriately stained and under very high power, and, as has been repeatedly demonstrated, it consists for the most part of *fæcal débris* forming the habitat of innumerable bacteria, and in the particular case here shown, bacilli are everywhere apparent (fig. 2). These are probably representatives of the colon bacillus. It is easy, therefore, to see how readily bacteria or their products may pass through the mucous membrane, particularly when this is in a condition of inflammation, along the lymphatic spaces, and so through to the peritoneal coat. Such contents of the appendix as were found in this case must always be a source of danger until removed. We have yet, however, to find the means for a certain diagnosis of the presence of such concretion before the exposure of the appendix, but if we surmise from the repetition of attacks that it is probable that such exist, it becomes imperative that the organ should be excised.

The next slide (fig. 3) represents a cross-section of the entire appendix removed from a lady of middle age sent to me by Dr. M. Handfield-Jones. She had an attack of typical

appendicitis exactly three months before I excised the structure, from which she had never actually recovered, as she continued to feel discomfort in the right iliac fossa, although able to be up and about.

Pressure over the region of the appendix shortly before operation gave rise to marked tenderness and there was still some rigidity of the right rectus. At the operation, the appendix was found about three inches in length and markedly kinked about its middle; the distal portion being greatly thickened and still showing evidence of active inflammation. The convalescence was interrupted by a rise of temperature on the eighth day to 102° , and remaining at the same height on the ninth day and rising to 102.6 on the tenth day, and this in spite of the fact that the bowels had been freely open and that there was no evidence of inflammatory mischief in the abdominal wall. The temperature fell after the administration of 3 grains of calomel with 5 grains of Dover's Powder. I think you will see that the condition of the appendix as shown by the sections may have been a cause, if not the cause, of this disquieting rise of temperature. The section shows an enormous thickening of the mucous and submucous coats almost completely obliterating the lumen of the tube. Just within the circular muscular fibres will be seen many enlarged lymphatic spaces—a condition which is almost always present in these acute or subacute cases. The lumen which is left is filled by actual pus containing large quantities of bacteria. In fact, this is an instance of what may be termed a small empyema of the appendix. Further, if we examine the pus under the high power you will observe that it contains numerous colonies of cocci, and these no doubt still in an actively virulent condition (fig. 4). I cannot help thinking that it was due to some infection of the parts entered upon

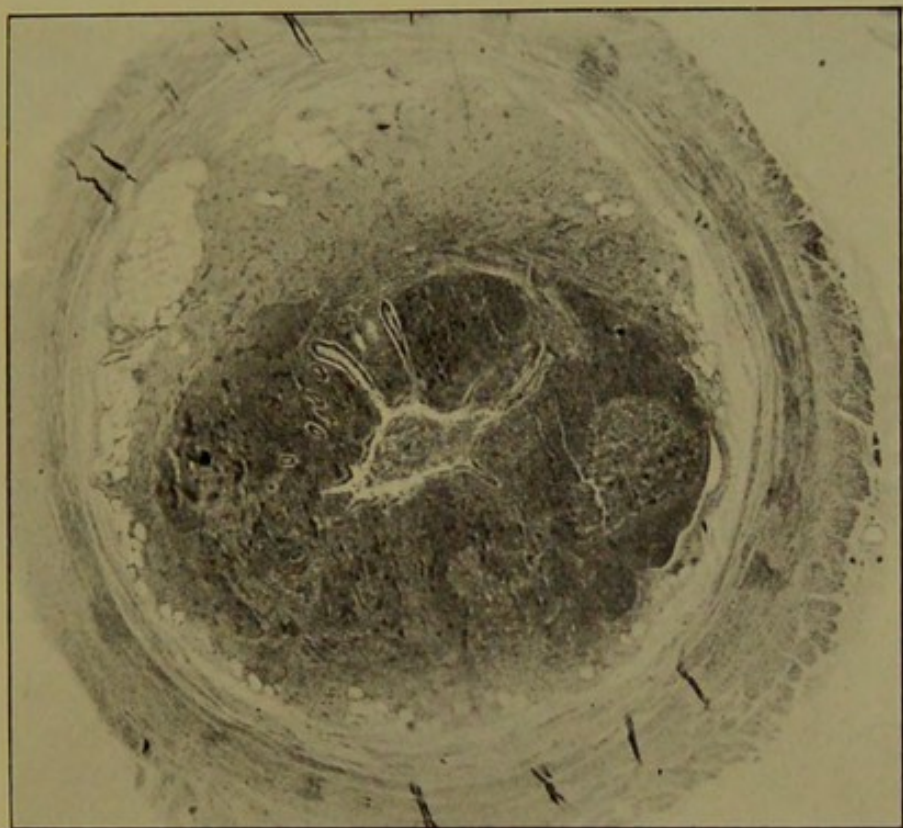


FIG. 3.—Section of inflamed appendix, showing great infiltration of the mucosa, and pus in the lumen. ($\times 50$).

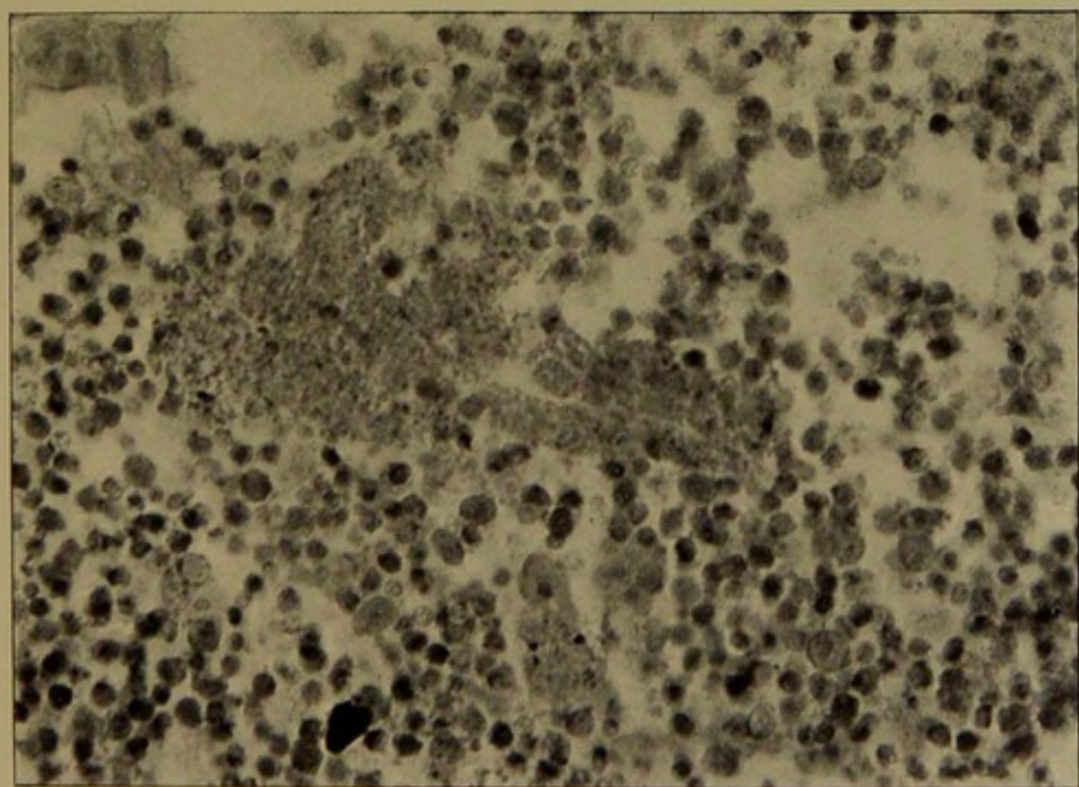


FIG. 4.—Pus from the lumen of inflamed appendix, showing colonies of staphylococci. ($\frac{1}{2}$ oil immersion).



FIG. 5.—Section of sclerosed appendix, proximal end, lumen obliterated.
($\times 50$).

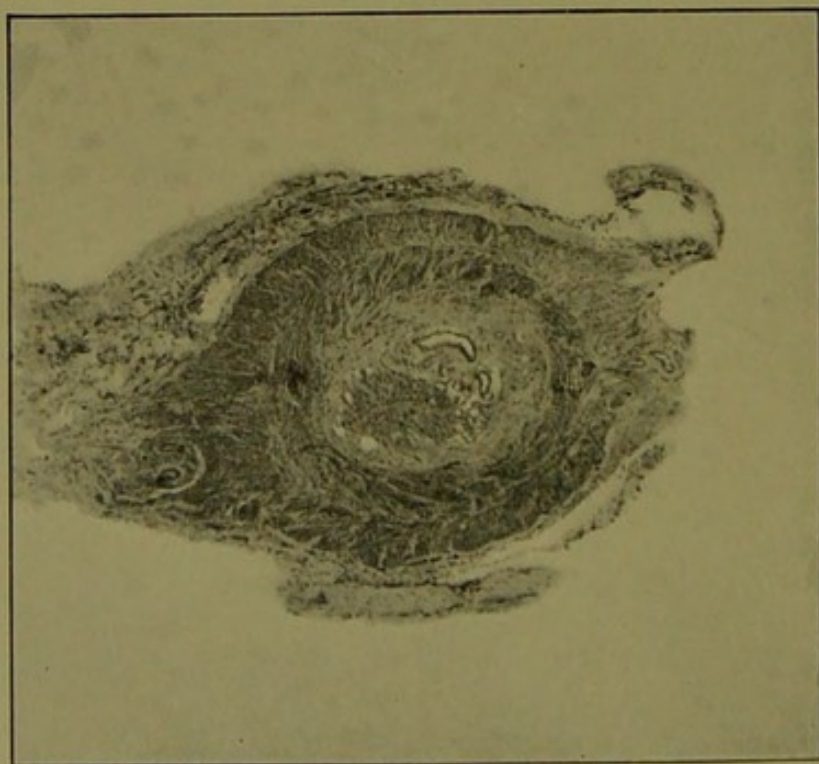


FIG. 6.—Section of the same appendix, distal end, a trace of lumen
remains. ($\times 50$).

in the operation by these cocci which afterwards led to the rise of temperature; a point which emphasises the extreme care that is needed to guard against such an accident.

The last sections (figs. 5 and 6) are taken from the appendix of a medical man who placed himself under my care, on the advice of Mr. T. Rushbrooke, and who had had at least two, if not more, attacks typical of inflammation of the appendix, and the condition found indicates, I think, that probably there had been many more slight inflammatory recurrences. The lumen of the appendix has become obliterated; at any rate it is difficult to make out any cavity which could represent it. This is apparently one of Nature's methods of attempting to bring about a cure, but it is impossible to tell in any given case that such sclerosis has occurred, and therefore it is justifiable to expose and remove the appendix.

I have ventured to bring before you these few simple facts because they indicate the differences which are found in various cases, and because each and all have been of considerable interest to myself.

