REPORT ON FIFTY CASES OF OPERATION FOR APPENDICITIS PERFORMED AT THE MILITARY HOSPITAL, COLCHESTER.

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The question of the proper time for surgical intervention in appendicitis is at present rather a vexed one. I am a follower of those who advocate that *every soldier* should be subjected to early and complete operation as soon as a diagnosis is made with certainty. It is well recognised that, although many cases will recover in the hands of the physician, relapses are the rule. They may occur in the soldier at a time and in a place where operation is not possible, and may in consequence lead to a fatal termination. On this account it is, I think, advisable to regard this disease in the soldier from a different standpoint to that in the civilian.

A great many of this series of operation have been performed with the knowledge that one was dealing with a chronic form of this disease, and I readily admit that some of these cases would not have been considered sufficiently serious to have justified one in urging operation had they occurred in a civilian. The soldier has to perform a certain amount of work whenever he may be called upon to do so. He cannot lie up, or do his work in his own time and at his own pace, as a civilian can. If he is the possessor of a damaged appendix, with its resulting adhesions and periodical attacks of discomfort, it is only reasonable, I think, to offer him the relief which follows on a comparatively simple operation, and one which is practically unattended by risk.

As the bulk of these operations can now be done under local analgesia, or with the assistance of a very small amount of a general anæsthetic, I think it will be found that many men will come forward and ask for relief from a very disabling affection, as soon as the news spreads through a given regiment.

As regards the proper time for operation, the acuteness of the initial pain is a test of considerable importance, and I think cases commencing in this way usually demand immediate operation. The statistics of operation within the first forty-eight hours of onset, show that the mortality during this period is not higher than that of the interval operation, which is practically *nil*. If not

done during this period, it is better to wait (provided the signs and symptoms are subsiding) and do the interval operation.

I do not think it advisable to allow a soldier's appendix to give rise to more than one attack without subjecting its owner to operation, just as the law allows the dog to have one bite without subjecting its owner to liability to damages.

As regards the two cases in which the operation was performed while the patient was suffering from pneumonia, I would point out that there were no symptoms pointing to this disease. In both cases the abdominal symptoms were so marked as to leave no doubt as to the presence of grave trouble in the appendix. The pain was so exceedingly acute that even if one had known of the existence of the pneumonia, nothing short of immediate operation would have given relief. It would have been very unwise to have given morphia, and no other anodyne would have sufficed. This would only have masked the symptoms, and in the required dose would not have benefited the pneumonia. It also appears to me that a patient would be in a much better condition to stand the operation if done within the first few hours of the onset of the pneumonia than he would be later on, if it were found to be urgently needed. Local analgesia would simplify matters here. Pleuro-pneumonia affecting the right base, especially if the diaphragmatic pleura is involved, is very apt to give rise to pain which is referred to the iliac fossa. The question of urgency of operation would be decided by the presence of other symptoms, such as acute tenderness and rigidity.

Where drainage is necessary, there is no doubt of the superiority of gauze over rubber tubes. The former acts by capillary action, whereas the latter can only act when assisted by gravitation.

In the last thirty-nine cases, the operation was done through the split internal oblique and transversalis muscles. In only two was there any difficulty in getting at the appendix, and in these, sufficient room was obtained by dividing the muscles in the upper half of the wound. These cut fibres were sutured with kangaroo tendon. The skin incision in the latter cases was placed about one finger's breadth from the anterior superior spine, and measured about $2\frac{1}{2}$ inches. The incision through the external oblique just reaches the muscular fibres at the upper end. The internal oblique and transversalis are separated in the line of their fibres and the transversalis fascia, and sub-peritoneal fat and peritoneum then divided in the same direction as the internal oblique. If the incision be made in the position usually recommended, it will

traverse the transversalis *above* the muscular fibres and will go through aponeurosis. Tendency to hernia must, I think, be made much less by going through the muscle fibres, and it is much easier to get at the appendix in difficult cases at this spot. Moreover, the closer one places a scar to this point, the less strain there will be on it subsequently.

A rather large proportion of cases in which three or four ounces of the solution of eucaine has been injected get chest complications. In some there appears to be a sort of broncho-pneumonia, and in others bronchitis. The temperature in neither case remains up for more than three or four days. I do not know whether the morphia which they get has anything to do with the production of these chest symptoms. Mr. Barker has written me to the effect that he does not think that chest complications are more common after eucaine than after general anæsthetics; but unless the eucaine has a definite action on the respiratory organs, there ought to be no chest complications at all. The symptoms are in no sense alarming, but it is well to know that they may be expected. In a few cases I have also noticed a sort of feeling of constriction over the præcordial region, lasting for two or three days.

In this series of cases there were only two appendix abscesses, viz., the first two, and they were admitted with this condition. Cases 3, 7, 8, 9, 11, 12, 16, 17, 18, 21, 24, 28, 35 and 47 would most probably have terminated in this condition, if immediate operation had not been performed. In some of these it is quite likely that the more serious complications of general peritonitis would have supervened. In any case, some resulting disability from adhesions, or ventral hernia, or recurrent attacks of appendicitis from failure to find and remove the appendix, would have followed delayed surgical treatment. Cases 3, 7, 8, 9, 11, 12, 16, 18, 21 and 24, in which very serious changes were found, were first attacks. These would seem to support the theory that immediate operation is the best course to pursue, provided the symptoms are very acute.

(1) Private J. No record of previous attack. Immediate operation. Large abscess cavity behind cæcum, with no adhesions shutting off the peritoneal cavity. Appendix not seen. Concretion of the size and shape of a cherry-stone came away in the drainage-tube four days after operation. Ventral hernia developed subsequently. Discharged to sick furlough sixty-four days after date of operation.

(2) Bombardier E. History of two previous attacks. Immediate operation. Large abscess cavity behind cæcum. Appendix not seen. Good deal of general peritonitis developed. Discharged to sick furlough thirty-six days after operation.

(3) Private E. No history of previous attack. Transferred from an out-station and operated on during interval. Tip of appendix adherent in Douglas' pouch and lying in small abscess cavity. Appendix removed. Drainage-tube. Discharged to sick furlough thirty-nine days after operation.

(4) Private W. History of three previous attacks, at intervals of three months. Fourth attack while in hospital for some other disease. Immediate operation. Appendix very long, tip bulbous, and contained a concretion. Discharged to sick furlough thirty-one days after operation.

(5) Private M. First attack three weeks previously, on furlough. Operation during interval. Extensive adhesions. Appendix was bent at a right angle, and its free extremity was very much distended. Discharged to sick furlough thirty-nine days after operation.

(6) Gunner D. History of six previous attacks. Operation during interval. Appendix very long, but appeared normal to naked eye. Discharged to sick furlough thirty-three days after operation.

(7) Sergeant B. First attack. Sudden intense pain at 8 p.m. Admitted and given morphia. Not seen by me until the following morning at 10.30. Immediate operation. Appendix gangrenous and perforated. Marked general peritonitis. Irrigation and drainage. Death five days afterwards.

(8) Sergeant T. First attack three weeks previously on furlough. Operation during interval. Tip of appendix was much expanded, was adherent deep in pelvis, and formed part of the wall of an abscess cavity. Gauze drain. A persistent sinus followed, and necessitated his being kept in hospital for sixty-one days after operation before it closed.

(9) Lance-Corporal S. First attack. Operation in quiescent period. Omentum adherent. Thick masses of yellow lymph round base of appendix, and its tip was adherent in iliac fossa. The base broke away close to the cæcum while being handled. Discharged to infectious hospital with German measles during convalescence.

(10) Private C. Second attack within four months. Operation during interval, but appendix still appeared inflamed. Discharged to sick furlough thirty days after operation.

(11) Gunner H. First attack. Immediate operation. Appendix very long, much inflamed, coated with lymph, and was twisted on its mesentery. Discharged to sick furlough twenty-eight days after operation.

(12) Gunner M. First attack. Immediate operation. Tip swollen, adherent, and coated with lymph. Discharged to sick furlough twenty-eight days after operation.

(13) Private B. First attack. Immediate operation. Appendix five inches long, much inflamed. Mucous membrane swollen and œdematous, and hæmorrhage had occurred into it in two places. Discharged to sick furlough twenty-seven days after operation.

(14) Sergeant A. Three attacks. Transferred from out-station after last for operation. Appendix very short, inflamed and bulbous. Discharged to sick furlough forty-nine days after operation. Stay in hospital was prolonged on account of a bedsore, which he had on admission.

(15) Private C. First attack one month previously. Operation during interval. Appendix very long, inflamed, and contained a large concretion. Vomiting and epigastric pain were so marked in this case as to cause gastric ulcer to be suspected. Discharged hospital twenty-four days after operation.

(16) Private L. First attack. Very sudden. Colicky pain chiefly referred to epigastrium. Much vomiting. Appendix easily felt through abdominal wall. Immediate operation. Appendix was as thick as one's thumb, quite rigid, full of pus, and its mucous membrane much ulcerated. There was a constriction about a quarter of an inch from its attachment. Discharged to sick furlough thirty-one days after operation.

(17) Private C. Third attack while in hospital for venereal disease; sudden onset. Immediate operation. Appendix very long, adherent by its tip in pelvis, and almost gangrenous. Discharged to sick furlough thirty days after operation.

(18) Private B. First attack. Sudden onset at 2.30 p.m. Reported sick at 11 p.m. Immediate operation. Appendix very short, full of pus, and had perforated at its base. The cæcum was adherent to the opening. Gauze drain for thirty-six hours. Discharged to sick furlough forty days after operation.

(19) Private P. Second attack. Immediate operation. Appendix much inflamed, and its mucous membrane very thick. Discharged to sick furlough forty days after operation.

(20) Private J. Several attacks, extending over two years. Appendix very long and still inflamed. Operation during interval. Discharged to sick furlough thirty days after operation.

(21) Private H. First attack. Extreme hyperæsthesia of skin over McBurney's point. Immediate operation. About six ounces of clear ascitic fluid escaped. Appendix very long, tense, coated with lymph, and its tip almost gangrenous. Gauze drain thirty-six hours. Discharged to sick furlough thirty days after operation.

(22) Private Y. First attack. Immediate operation. Appendix 7 inches long; much inflamed; black patch at centre. Discharged to sick furlough twenty-eight days after operation.

(23) Private A. Second attack. Immediate operation. Appendix much inflamed, and contained a long concretion. To sick furlough thirty days after operation.

(24) Private C. First attack. Reported sick three days after onset. Immediate operation. Appendix much disorganised and lay in an abscess cavity behind cæcum. Removed. Gauze drain forty-eight hours. To sick furlough thirty days after operation.

(25) Private B. Third attack. Operation during interval. Appendix bound down in pelvis by extensive adhesions. Discharged to sick furlough twenty-seven days after.

(26) Boy F. First attack. Operation during interval. Appendix much inflamed, about double its ordinary length, tip bulbous. To sick furlough after thirty days.

(27) Private W. History of constant pain and discomfort for past month. Operation during interval. Appendix very long, much inflamed, mucous membrane very swollen and congested. Several hæmorrhages into it. To sick furlough after twenty-six days.

(28) Lance-Corporal P. Second attack. Sudden onset six hours before admission, high temperature, acute pain and collapsed appearance. Immediate operation. Appendix was very thick and fibrous, and it was constricted about the centre. About 4 ozs. of clear ascitic fluid escaped when the peritoneum was opened. This man was found to be suffering from lobar pneumonia next day, and he evidently had this disease at the time of his operation, although his symptoms were undoubtedly those of acute appendicitis. To sick furlough after thirty-three days.

(29) Private W. History of never having been free from discomfort and tenderness over appendix for past six years. Operation during interval. Appendix was smaller than normal. Its lumen and lining membrane were quite normal for three-quarters of an inch from the base. At this point there was a complete stricture extending for about half an inch. Beyond this there was a small channel leading into a very diminutive tip. It appeared most probable that his symptoms had been caused by periodical distension of this diminutive appendix, and the contents being unable to escape, gave rise to appendicular colic. To sick furlough after twenty-nine days.

(30) Lance-Corporal L. History of repeated attacks extending over two years. Operation during interval under eucaine and adrenalin. About thirty drops of chloroform were required to enable the appendix to be withdrawn from the abdomen. It was about twice the normal thickness, very congested, and had patches of lymph in two places. To sick furlough after thirty days.

(31) Lance-Corporal C. First attack. High temperature and very rapid pulse. Immediate operation under eucaine and adrenalin. About one drachm chloroform was required as in the last case. Appendix was very long, much inflamed, and mucous membrane showed ulceration at one spot. To sick furlough after twenty-six days.

(32) Gunner J. Second attack. Operation during interval under eucaine and adrenalin. No chloroform required. Many adhesions present and old changes in mucous membrane. To sick furlough after thirty days.

(33) Private W. Repeated attacks. Operation during interval under

eucaine and adrenalin. No chloroform required. Marked signs of chronic inflammation present. To sick furlough after thirty-two days.

(34) Private C. Repeated attacks. Appendix could be easily felt through abdominal walls. Operation during interval under eucaine and arenalin. No chloroform required. Appendix much thickened and contained thread worms. To sick furlough after thirty days.

(35) Private D. Second attack. Sudden onset while a patient in hospital for venereal disease. Temperature 99·8° F. Pulse 148. Looked very ill. Immediate operation. Peritoneum bulged into wound and was much congested, and sero-pus escaped when it was incised. The appendix was covered with old lymph and extended upwards along the outer side of the cæcum. Some muscle fibres had to be divided in order to remove it. The abdomen was opened under eucaine, and chloroform anæsthesia was subsequently given. To gonorrhœa ward after twenty-six days, for further treatment. Gauze drainage.

(36) Private B. Second attack. Operation during interval. Appendix very long, and its base had to be divided first. Extensive old adhesions present. The abdomen was opened under eucaine and adrenalin, but A.C.E. had to be given to complete the operation. To sick furlough after thirty-nine days.

(37) Private M. Stated that it was a first attack. Sudden onset six hours previously. Intense pain over appendix. High temperature, very rapid pulse and a gray, pinched, abdominal appearance. Was thought to have an appendix which had perforated. Immediate operation. Signs of old adhesions round appendix. Found to have right lobar pneumonia next morning. This spread to the left lung after six days, and he developed pericarditis by extension. He died on the eighth day. He had no abdominal symptoms after the operation.

(38) Private G. Persistent discomfort and tenderness for past twelve months. Three definite attacks. Appendix could be easily felt through abdominal walls. Operation during interval, under eucaine and adrenalin. No chloroform required. To sick furlough after thirty-three days. Marked signs of old trouble in appendix.

(39) Private P. History of two definite attacks, and of continuous discomfort for the past three months. Operation during interval under eucaine and adrenalin. About one drachm chloroform was required in order to get the appendix outside. It was very fibrous and had no lumen for about one inch from its tip. There were very extensive adhesions present. To detention barracks to finish his sentence after thirty-five days.

(40) Private W. History of repeated slight attacks. Operation during interval under eucaine and adrenalin. No chloroform required. Appendix thick, pale and fibrous. Mucous membrane only extended for about $1\frac{1}{4}$ inches from the base, and from here to the tip the lumen was obliterated

and the organ converted into dense fibrous tissue. To sick furlough thirty-three days after operation.

(41) Lance-Corporal S. History of acute attack in civil life two years ago, when a surgeon wanted to remove the appendix. Has had repeated slight attacks since, and constant discomfort. Operation during interval under eucaine and adrenalin. No chloroform required. Appendix very long and thick. Abundant old adhesions to the abdominal wall. Signs of chronic inflammation in the appendix. To sick furlough thirty days after operation.

(42) Sergeant E. Admitted at 9 p.m. with severe pain over appendix. Pulse 120. Temperature 103° F. Operation next morning under eucaine and adrenalin. Appendix was very long, and contained three No. 6 shot. There were extensive adhesions all over the cæcum and appendix. First attack three weeks previously. To sick furlough thirty days after operation.

(43) Private H. Second attack. Operation under eucaine and adrenalin in interval. Many old adhesions round the base, and the appendix was exceedingly long. Numerous small hæmorrhages into its mucous membrane. To sick furlough thirty days after operation.

(44) Private C. First attack. Appendix easily felt. Immediate operation under eucaine and adrenalin. The organ was thick and fibrous and contained a fæcal concretion as thick as a slate pencil and about half an inch long. The attacks of colic would appear to be due to the efforts made by the appendix to expel this foreign body. To sick furlough thirty days after operation.

(45) Private F. Chronic appendicitis extending over seven months. Refused operation on admission, but changed his mind owing to the severity of his pain. The appendix was removed under eucaine and adrenalin. It was very long and there were many adhesions at the base, bending it at an angle. To sick furlough twenty-eight days after operation.

(46) Private G. History of acute attack two years ago, which kept him in bed for three weeks. No attack until the present one, which was sub-acute. Operation under eucaine and adrenalin. Appendix extremely short, tip bulbous, and about one inch from this there was a complete fibrous stricture about an eighth of an inch wide. To sick furlough twenty-eight days after operation.

(47) 2nd Lieutenant St. G. History of acute attack four years ago and of several slight ones since. Sudden onset, with rigor and tenderness; appeared to be spreading rapidly. Immediate operation under eucaine and adrenalin. A few drops of chloroform required to get the appendix out. The peritoneum was much injected, and the skin was extremely hyperæsthetic. It was hardly a fair test for eucaine on this account, and I do not propose to do such a case in future under it. Appendix much swollen, very livid, coated with old adhesions and very long.

Temperature same night 102° F., next morning 103° F., but rapidly fell to normal. Healed by first intention and still in hospital.

(48) Private B. History of sharp attack ten months ago. No symptoms until last ten days. Distinct tenderness. No temperature. Operation under eucaine and adrenalin. No chloroform required. Appendix retro-cæcal, and very difficult to withdraw. It contained two concretions, and the mucous membrane was studded with minute hæmorrhages. Two small ulcers were also present. Still in hospital.

(49) Private McG. Brought in collapsed on stretcher at 11 p.m. Sudden attack of pain same morning while at work. It wore off, but came on again in town and he had difficulty in getting home. Referred all his pain to præcordial region at first. Definite tenderness over appendix and history of inability to ride for past two months owing to dragging there. No temperature. Operation under eucaine and adrenalin. Unable to withdraw appendix at all, owing to adhesions, so base was dealt with first and the appendix gradually separated from behind the cæcum. A little chloroform was required for this. It was very long and contained three small concretions. Healed by first intention and is still in hospital.

(50) Private P. First attack. Operation during interval under eucaine and adrenalin. No chloroform required. I was unable to get more than the tip of the appendix into the ordinary wound. The organ was lying high up on the outside of the ascending colon, and was attached to the upper part of the cæcum on the outer side instead of in the usual place. The incision had to be extended upwards and the muscle fibres divided in the upper part of the wound. Numerous fresh adhesions were present, and the mucous membrane was studded with minute hæmorrhages. The parietal peritoneum was also much injected. Still in hospital.