

no new principle involved, but possibly the particular application of these various remedial agents may be suggestive. It will, at any rate, emphasize what may be called the conservative way of looking at the treatment of pelvic inflammations and their results.

THREE CASES OF OCCLUSION OF THE SUPERIOR MESENTERIC ARTERY.¹

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THE cases which I present to-night are not only interesting in themselves, but show the tendency of rare pathological conditions to occur in groups. All of the autopsies were made within the last two weeks, and they are the first specimens of the sort which I have seen for a number of years.

CASE I. The first specimen which I shall show comes from an autopsy made for Dr. J. L. Hildreth. The clinical history of the case is as follows:

Mrs. X., aged eighty-five. Although feeble for a number of years, the general health was fairly good with the exception of attacks of bronchitis at intervals. Twelve days before death she had not been feeling well, and went to bed somewhat earlier than the usual hour. She was not able to sleep, and called an attendant at ten complaining of pain in the bowels. The pain became more intense, and Dr. Hildreth first saw her at 2 A. M. At that time she was restless, complained of intense pain in the bowels; pulse 70. No physical signs could be made out either in chest or abdomen. The pain was referred vaguely to the right iliac fossa. An opiate was administered, and repeated until pain was allayed. In the morning the pain returned in the same place. A large enema was given, which produced no results. There was no passage of flatus from the bowels. The abdomen became more distended, and the pain seemed localized in the right iliac fossa. At the end of the third day the condition continued the same. No vomiting. The temperature 1° sub-normal. Dr. Marcy, of Cambridge, saw patient in consultation on the fourth day. Diagnosis made of complete obstruction of bowels. An operation was suggested, but not urged. All of the symptoms continued until the seventh day when the temperature was 2½° sub-normal. From this point the temperature gradually arose, and before death reached 2° above normal. Vomiting commenced on the fourth day before death, finally becoming fecal. The pulse became quicker and weaker, and death took place twelve days after the first attack.

At the autopsy the abdomen was greatly distended. The intestines were enormously distended and somewhat congested. In the lower lobes of both lungs and in the posterior portions of the upper lobes there were numerous areas of consolidation. The pleura over these portions of lung was covered with a fine fibrinous exudation. The consolidation in the upper lobes had a distinctly lobular distribution. In the lower lobe of the left lung the consolidation was more extensive, but here, also, was apparently produced by the confluence of smaller foci. There was extreme fatty degeneration and atrophy of the heart and extensive atheromatous degeneration of the aorta. The heart was perfectly flaccid and so soft that the finger could be thrust

¹ Specimens of these cases were shown at a meeting of the Boston Society for Medical Improvement.

through the ventricle at any point. The entire abdominal aorta was covered with flakes of calcification. On these rough, calcified plates there were numerous thrombi. The most extensive thrombus was on the anterior surface of the aorta just above the origin of the superior mesenteric, and almost completely occluded the opening of the artery. The thrombus extended for a very short distance into the artery, but the artery itself was free from both emboli and thrombi. The small intestine was greatly distended, and in places there were a few small ecchymoses; but there was neither intense congestion nor at any point complete infarction.

In this case it seems probable that the partial occlusion of the artery by the thrombus in the aorta was, in the weakened condition of her circulation, sufficient to cause entire paralysis of the bowel and obstruction from this reason.

Cultures made from the tissues gave pneumococci in the consolidated portions of the lung, in the spleen and in the liver. In all of the organs colon bacilli were found.

CASE II. The clinical history of this case, of which the heart, aorta and mesentery were shown, is this:

R. T., aged sixty-one. Entered hospital January 19th. Complained of pain in left foot and ankle. The parts were much swollen, cold and blue. Three days afterwards the right foot showed the same process. Two days before death complained of pain in abdomen, pulse gradually sank and death took place.

At the autopsy the intestines were found enormously distended. The peritoneum was covered with a fibrino-purulent exudation, which in places produced a slight adhesion of the loops of the intestine. Pockets of pus were here and there found between the adherent loops of intestine. The entire small intestine was deeply injected and in the jejunum for a distance of about sixty centimetres the wall was greatly thickened and hæmorrhagic. In endeavoring to discover the cause of the peritonitis all the ordinary sources could be excluded. There was no evidence at any point of intestinal perforation. The mesenteric artery, however, was seen to be completely occluded by a thrombus about half-way between its origin and the intestine. This thrombus was firmly adherent to the wall and was totally occlusive. Beyond the thrombus there was a short space in the artery which was filled with a soft, dark coagulum, and further up, just opposite the area of intestine which shows the hæmorrhagic infarction and at a point in the artery where three branches are given off together, there was another thrombus which was also firmly adherent. On opening the intestine it was seen that on the mucous surface, in addition to the infarction, there were areas of distinct necrosis — some of these areas passing through the intestine. The source of the thrombus masses in the artery was evident from an examination of the aorta just above the heart. Here a roughened, calcified plate on the intima of the artery was seen, and adherent to this was a large thrombus. The thrombus in the aorta was evidently of a rather old date. In the kidney and in the spleen there were numerous infarctions produced by emboli. Some of these infarctions were anæmic, others hæmorrhagic. In some of them there was organization of the anæmic territory with cicatrization.

In both lower extremities, more marked on the right side, there was gangrene extending nearly up the knee. No line of demarcation as yet produced. The parts

were swollen, red, infiltrated with bloody fluid, large vesicles beneath the epidermis, and in places on the calf of leg the epidermis had desquamated. The arteries of both extremities occluded by thrombi. On the right side the thrombus extended up to the middle of the femoral artery; on the left side up to the popliteal. The occluded arteries were smooth, the thrombi tightly adherent.

On microscopic examination of the peritoneal exudation, colon bacilli were found in large numbers, and cultures from the peritoneum and from the other organs showed a general infection with colon bacilli. No other organisms were present in the cultures.

This case is of interest from the extent of the embolism, and also as showing peritonitis certainly produced by the colon bacilli, with a general infection of the other organs. From the examination of the intestine and the superior mesenteric artery, it would seem probable that there were here two emboli of different dates. The embolus towards the end of the artery, corresponding to the area of beginning hæmorrhagic infarction and necrosis, is evidently of older date than the one occluding the artery nearer its origin.

CASE III was from an autopsy in the Massachusetts Hospital for which I am indebted to Dr. W. F. Whitney. The clinical history is as follows:

A. B., seaman, aged sixty-two. At age of twenty, in bed for six months with general muscular tenderness and inability to use arms and legs. During this time there was some dyspnoea and slight palpitation. Since then he has had many similar painful attacks, but no cardiac symptoms until six months ago, when there was a sense of constriction in the region of the heart and marked shortness of breath. This condition increased constantly, and finally compelled him to cease work. Orthopnoea and anasarca then appeared, and have existed for the last month. When he entered the hospital the skin was somewhat jaundiced, and the respiration had at times the general Cheyne-Stokes characteristics. Four days later the abdomen became quite tender. On the following day the tenderness increased, and frequent loose stools occurred. There was hæmoptysis with physical signs of consolidation, and the pulse became very rapid and irregular. Four days later death took place. The abdominal pain and diarrhoea, with some elevation of temperature, persisting until the end.

I showed the mesenteric artery, with a portion of the intestine, from this case. Almost the entire small intestine was in a condition of hæmorrhagic infarction. The bowel contained a thin hæmorrhagic fluid; the walls of the intestine were greatly thickened from hæmorrhage. On the peritoneal surface of the intestine everywhere there was a very slight fibrinous exudation. The mesenteric artery from its beginning was entirely occluded by a thrombus. The source of the thrombus was not definitely made out. The heart was greatly enlarged. The aorta dilated, roughened, and the aortic valves relatively insufficient. It is probable that the thrombus in the mesenteric artery was of embolic origin, and came from a thrombus which had formed in the roughened aorta.

These cases are all of interest. In the first the clinical picture was that of obstruction without peritonitis. In the second there was a marked peritonitis and in the third only a slight beginning peritonitis. The cause of the peritonitis in the second case was evidently due to the colon bacillus. It is not necessary

to have an ulceration of the intestine or perforation in order for this organism to enter into the peritoneal cavity or into the tissues. There is no organism so commonly found in cultures from the various organs as is the colon bacillus. It is found in disturbances of the circulation of the intestine, such as is given in extreme chronic passive congestion. The resistance of the tissue in these cases is apparently so lowered that the organism finds entrance into the tissues. In all cases in which there are lesions of the mucous membrane of the intestine, it matters not how slight in character, the tissues will be invaded by this organism. In the second case in which there was marked peritonitis, the bacillus apparently found suitable conditions for growth in the necrotic tissue of the intestine, and it evidently passed through, or grew through, the intestinal wall into the peritoneal cavity. In a case which I autopsied at the City Hospital lately, there was a general fibrino-purulent peritonitis of slight degree in which the colon bacillus was found to be the only organism both in the peritoneal cavity and in the cultures. The source of the peritonitis in this case was in a small area of the intestine which had been incarcerated in a hernia. In the incarcerated portion of the intestine there was intense congestion with slight necrosis of the mucous membrane.

Hæmorrhagic infarction of the intestine resulting from obstruction of the mesenteric artery is an extremely interesting condition. In spite of the size of the mesenteric artery and in spite of the angle in which it leaves the aorta, which would appear to favor the entry of emboli into it, large emboli appear to be extremely rare. It is probable that small emboli frequently do enter the artery, but from the character of the circulation of the intestine and the abundant anastomosis which are found between the small branches of the artery, these small emboli produce no harm. The superior mesenteric artery is in no way a terminal artery in the sense of Cohnheim. There are numerous anastomoses, not only between the very small branches, but with the gastro-duodenal and inferior mesenteric. The area of tissue supplied by the artery, and the extreme length of the intestine are unfavorable for the development of a sufficient collateral circulation. In the dog, tying of the superior mesenteric near its origin always produced complete hæmorrhagic infarction of the intestine. The infarction is due to the entry of blood into the anæmic territory from the anastomoses above and below. It is remarkable that in the three cases which I show, the hæmorrhagic infarction should have been so slightly developed. In only one case, that from the Massachusetts Hospital, was it at all extensive. In the second case, although the entire artery was obstructed, there was only a beginning infarction in a small area of the intestine corresponding to the first embolus. In the first case it is probable that the thrombus of the aorta extending into the artery was not a totally occluding one. Only in this case was obstruction of the intestine a prominent clinical feature. It is probable that sufficient blood entered through the obstructed artery and through the anastomosis to preserve the integrity of the vessels sufficiently to prevent diapedesis and infarction, but not sufficient to provide the necessary enervation. It is important to know that obstruction of the superior mesenteric artery may give rise to paralysis of the intestine, obstruction and to peritonitis, and it is a condition which is beyond surgical interference.