

SULLIVAN (J.D.)

Clinical Observations on
Appendicitis,

With Report of Cases illustrating Different Forms of the Disease.

BY

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BROOKLYN.

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EMULATING the example of my distinguished predecessors, I will make a free interpretation of the provision in the by-laws of this association which states that "at the February meeting each year the nine-o'clock hour shall be devoted to an address by the president of the preceding year upon the progress made during the year in that branch of medical art or science in which he may have been specially interested," and trust that I shall comply with the spirit of that by-law by presenting a paper which will embrace some of my individual observations on appendicitis during the year.

It is now quite universally admitted that we are indebted to the achievements of modern surgery for our present knowledge of the pathology and the treatment of diseases originating in the vermiform appendix, and that the progress made in that special branch of medical science

* Read before the Kings County, N. Y., Medical Association, February 14, 1893.

within the last six years has been the means of saving hundreds of our fellow-creatures from an untimely death. Although the various forms of appendicular inflammations have been repeatedly described and demonstrated, and the appropriate treatment of each form intelligently discussed and applied, I still think that we have yet much to learn before we can ultimately claim proficiency in dealing with them.

Believing that clinical knowledge is more instructive and practical than rehearsing the experiences and teachings of others, and that the careful study of a comparatively few cases will afford a more definite knowledge of the pathological conditions of the appendix and the indications for treatment than an indefinite amount of theory based on the casual observation of a very large number, I have selected the following cases for the purpose of illustrating the views now entertained on this subject, and crave your indulgence if I occupy your time unprofitably by dwelling too minutely on the minor details of each case :

CASE I.—Miss J. B., a well-developed young lady, aged twenty-two years, enjoyed good health up to March, 1888. One day while at school she was taken with a severe pain in the lower portion of her abdomen, which continued for several days and obliged her to remain in bed for three weeks. During that time she was treated by a homœopathic physician, who said she had "inflammation of the bowels." For several weeks after that there was tenderness in the right inguinal region, and for the following two years she continued to have occasional attacks of a similar character, and always accompanied by derangement of her digestive organs. On October 25, 1891, I was called to attend her. Her temperature was 100°, pulse about 116, bowels constipated, and she complained of pain in the right side of her abdomen.

Pressure at a point two inches and a half from the right anterior superior spine of the ilium in the direction of the umbilicus, known as "McBurney's point," elicited acute pain. No

tumor could be found. Absolute rest in the recumbent position, hot fomentations to the abdomen, gentle laxatives, and fluid diet were prescribed. The pain gradually subsided and there were no indications for further treatment. Although she did not appear sick after the first few days, her temperature remained at about 100° , and there was tenderness on pressure over the cæcum for a period of two weeks.

On June 24, 1892, I was again summoned to see her, and she presented all the symptoms of her former attacks excepting that the pain was more severe. On this occasion I ordered the application of a mercurial ointment, diluted with six parts of stramonium ointment, to the seat of pain, instead of the hot fomentations. She recovered from this attack in about one week. Since then she has had two light attacks, but by resting in bed and applying the mercurial ointment the pain ceased within a few days.

A few weeks ago she called at my office and I made an examination of her abdomen. There is no evidence of a tumor or induration, but there is a marked tenderness on pressure in the location known as the McBurney point. She informs me that any very active exercise, as dancing or going rapidly up or down stairs, will cause a moderate degree of pain in the right inguinal region, extending over the abdomen and down the right thigh. She now realizes the nature of her trouble, and knows that while her digestive organs are in good condition she is not so liable to a recurrence of these attacks.

This is evidently one of the cases which is called catarrhal appendicitis, in which we may assume that supuration has not yet occurred, or, if it has, the pus was either absorbed or discharged into the bowel. There must have been more or less local peritonitis accompanying the several attacks, but the inflammation was probably of a plastic type and did not extend beyond the immediate vicinity of the appendix. The great contrast between this case and the next is worthy of special attention.

CASE II.—Miss M. C., a healthy young lady, aged twenty-three, on May 23, 1892, was quite suddenly seized with acute

abdominal pain, which was continuous and severe throughout that night. The next day I was called and found her sitting up in the parlor. She did not complain of being very sick, but simply wanted something to relieve the "cramps in her bowels." Her temperature was 101° , pulse 120, bowels free, and her general appearance was fairly good.

An examination of the abdomen revealed a point of extreme tenderness in the right inguinal region, about two inches and a half from the anterior superior spine of the ilium in the direction of the umbilicus.

No tumor was perceptible. I was quite positive in my diagnosis of appendicitis, but unable to determine the character of the inflammatory process. It required considerable persuasion to make her realize the importance of remaining in bed and complying with my instructions. Hot fomentations were applied to the abdomen and small doses of sulphate of magnesia prescribed. A few moderate doses of opium were ordered to be taken only when the pain was severe. On the following day she appeared quite well and comfortable, but her pulse continued at 120 and her temperature had risen to 102° . Bowels had moved freely. There was slight dullness on percussion and acute pain on pressure at the typical point, extending toward the median line of the abdomen. On May 26th, the third day of the disease, the general symptoms were about the same and the local induration was more distinct and painful. On the fourth day the pulse was more rapid, the temperature had risen to 103° , and the tumor was well defined. The patient presented an expression of anxiety, and while the pain continued in a moderate degree it did not increase in proportion to the other symptoms. I was now certain that an abscess had formed, and recommended an operation, but, at the earnest solicitation of the patient and her friends, I consented to wait another day.

By the fifth day her temperature had fallen to 102° , pulse 130, soft and weak, and her general appearance indicated great depression. It was evident that the patient was passing into a state of collapse, and that an operation offered the only hope of saving her life. She was carefully removed to St. Mary's

Hospital, and, assisted by the house staff, I made the usual abdominal incision directly over the tumor. When the abdomen was opened the small intestines presented an intensely congested appearance and were adherent to the caput coli. While separating the adhesions I opened into an abscess cavity containing about three drachms of very offensive pus. This was carefully taken up on sponges, and the appendix, which was black and in a gangrenous condition, perforated at its base, was found on the inner side of the caput coli. While attempting to ligate the appendix at the proximal side of the perforation the ligature cut through the necrotic tissue, and the dead, offending organ was removed. Another attempt was made to close the appendicular opening, but the tissues were so necrotic and friable that they would not hold a ligature or suture.

After all the inflammatory products were removed, a square piece of iodoform gauze was laid over the wound, its center depressed to the bottom of the abscess cavity, and the pocket thus formed was packed with several strips of the same kind of gauze. By this means the intestines were walled off and the packing could be removed without disturbing the abdominal contents. A few sutures were placed in the upper angle of the wound and the usual dressings applied. On the following day the patient was bright and comparatively comfortable and her convalescence was uninterrupted thereafter.

The dressings were changed on the third day, and the wound was found in a very favorable condition. I was agreeably surprised to find the former site of the appendix covered over with a healthy exudation, and that there was no opening into the bowel. Within a week the abscess cavity was covered with healthy granulations, and the reparative process continued undisturbed until the wound was completely healed. The patient left the hospital July 21st, and has remained in perfect health since.

If you will permit me to take you over another phase in the history of this case you will readily understand how easy and apparently reasonable it would be to allow the patient to pass into a hopeless condition before resorting to

any efficient treatment for her relief. When I first saw this lady she did not appear to be afflicted with any serious ailment, and as I was in a hurry to keep another engagement, it would seem quite natural to prescribe for her "colic" on general principles; but the danger of possible appendicitis flashed through my mind and I insisted upon a physical examination of the abdomen. By the second day the few doses of opium had given her a sense of false security, and she appeared so well that her relatives were willing to dispense with any further professional attendance.

Experience had taught me that in these cases subjective symptoms were not to be trusted, and that the omission of proper attention, even for a day, might prove disastrous. It is well known that septic peritonitis may exist without much pain or elevation of temperature. The conditions found in this case, when the abdomen was opened, showed that the gangrenous appendix was inciting a septic peritonitis, and demonstrated the fact that the operation could have been done to a better advantage a day or two sooner, and that in all probability a further delay of twenty-four hours would have allowed the disease to progress to a fatal issue. To me this was a very instructive case, for it brought to my recollection the demise of several useful members of society whose deaths occurred under a similar train of symptoms, because the true pathological conditions were not clearly comprehended at the proper time.

CASE III.—Mr. J. C., aged forty-six years; occupation, furrier. A robust man who had enjoyed good health up to September 14, 1892, when he began to have pain in the lower portion of his abdomen. While the pain was persistent and annoying, it was not very severe, and he continued at his employment as usual for the next three days. During that time his bowels were regular and his general health fairly good. On September 17th the pain suddenly became so severe that, to use his own expression, "it doubled him up" for some hours.

This pain was accompanied by nausea and was followed by a chill and fever.

Dr. J. R. Kevin, of this city, was called to attend him, and promptly made the diagnosis of appendicitis. After three days' observation and treatment, Dr. Kevin considered the case a proper one for surgical interference and he was sent to St. Mary's Hospital. He arrived there September 20th at 8 p. m. I saw him at 9.30 that evening, and upon examination found a well-marked tumor in the right inguinal region which was quite hard and not very painful on gentle manipulation. After the usual preparation an incision was made through the abdominal wall, over the tumor, and a hard mass, composed of omentum and inflammatory products, was exposed. While separating the adhesions around the tumor an abscess cavity was opened which contained about half an ounce of pus, which was removed with sponges. The mass was found to contain the ruptured vermiform appendix, which was given off at an acute angle from the outer side of the ascending colon at about an inch above its lower extremity. The appendix was ligated near the colon, severed, and the stump cauterized with pure carbolic acid. That portion of the omentum which was involved in the tumor was ligated in sections with catgut and cut off, and the entire mass was detached with the fingers from its surroundings and removed. The space was carefully cleansed and packed with iodoform gauze. About one third of the wound was closed with silkworm gut and the usual toilet made.

The next day the patient was comfortable and in a good condition; pulse, 90; temperature, 100°.

In a few days his pulse and temperature became normal and continued so throughout his convalescence. His bowels were moved on the second day and acted well thereafter. On the third day the dressings were removed and the wound cleansed and repacked with iodoform gauze, and subsequently they were changed every other day.

By the end of the third week the wound was closed, with the exception of a small sinus which led down to the stump of the appendix.

At about the fifth week small particles of fæces began to

escape from the sinus, and a probe could be carried directly through it into the colon. This fistulous tract was repeatedly cauterized with nitrate of silver, and various stimulating applications—such as peroxide of hydrogen, balsam of Peru, naphthalin, etc.—were applied at different times, but traces of fecal matter appeared at irregular intervals for a period of four weeks more. Then for three weeks the sinus remained as a very small fistula from which only a little clear mucous escaped. This mucus evidently came from the mucus follicles in the stump of the appendix, and demonstrated the fact that the mucous membrane in the stump was the cause of the delay in the healing of the wound and shows one of the evil results of leaving any portion of the appendicular tissue remaining. The delay was very annoying, as the patient was in perfect health in all other respects.

Comparing the symptoms presented in this case before the operation with the pathological conditions found after opening the abdomen, I deem it proper to term it one of acute ulcerative appendicitis in which the plastic inflammation protected the patient from general peritonitis. It is fair to assume that the mild pain which simply annoyed the patient for the first three days of the attack was caused by the ulcerative process, and that a perforation of the appendix occurred on the third day when the violent pain was felt. Then a localized peritonitis was excited, but its extension was limited by the formation of an abscess wall composed of omentum and loops of small intestine, which were firmly bound together by the plastic exudation. This pathological condition illustrates the absolute necessity of surgical interference in this class of cases.

CASE IV.—Mr. S. H., a spare young man, aged twenty-one years, occupation bookbinder, walked into my office, October 14, 1892, and gave the following history of his ailment: Ten days before, while lifting a package of paste board on to a table, he was seized with an acute pain in the right lower portion of his abdomen, which obliged him to quit work and go home.

Thinking that it was only a trifling disturbance in his bowels, he refused to have a physician called, but took a cathartic and remained in bed for the next three days, suffering only a moderate degree of pain. After the third day, while the pain in the right loin was quite constant it was not very severe, and he walked about more or less daily, and slept fairly well at night. As he came into my office I observed that he leaned forward and to the right side, stepping very carefully with the right leg. His pulse was 120, soft and compressible, and his temperature 101.4° .

On inspection, there was a well-marked fullness in the right iliac region. Pressure with one finger at the McBurney point did not elicit any special tenderness, but from a point an inch and a half in front of the anterior superior spine of the ilium, and extending upward and backward just above its crest to the right quadratus-lumborum muscle, the tissues were tense, firm, and very painful. My diagnosis was that the tumor was a paratyphlitic abscess, which was burrowing toward the right. I advised him to submit to an operation on the following day, to which, after consultation with his parents, he consented. He slept well that night without an anodyne, and at ten o'clock the next morning his pulse was 112 and his temperature 100° . Notwithstanding this apparent improvement in his condition, he was then sent to St. Mary's Hospital, and, after the usual preparation, an incision about four inches and a half long was made about an inch outside the linea semilunaris and the peritoneal cavity deliberately opened. The intestines were held aside and protected with pads of sterilized gauze, and it was then seen that the tumor, commencing at the outer surface of the caput coli, extended outward, upward, and backward to the lumbar muscles. While separating the tumor from the abdominal wall on the right of the wound, a quantity of fœtid pus and a fœcal concretion came into view.

The abscess cavity was cleaned out, and the appendix, curved like the letter S, was found at the bottom completely invested with a false membrane of organized lymph, and presenting an opening at its extremity whence the fœcal concretion escaped. The false membrane was peeled off, and the appendix

ligated near the cæcum and removed. The stump was cauterized, the wound partially closed, the abscess cavity packed with iodoform gauze, and the usual dressings applied.

On the following day the patient was bright and comfortable. His pulse and temperature were nearly normal, and continued so throughout his convalescence. The wound was dressed on the third day, and every second or third day thereafter. On the tenth day the ligature which was placed on the appendix came away, and the wound was closing rapidly by healthy granulations. About this time the patient stated that he could occasionally feel air or gas escaping from the wound. An examination revealed a small opening in the stump of the appendix, through which a probe passed into the caput coli. This proved to be the appendicular canal through which the intestinal gases were escaping. Then the impossibility of effecting a permanent closure of the appendix with any kind of a ligature was forcibly impressed upon my mind. As it is impossible to make mucous surfaces grow together by holding them in apposition, it is but reasonable to expect that when the portion of the pedicle outside the ligature sloughed away, or the ligature became absorbed, the lumen of the remaining portion would still be patent. This subject will presently be referred to again. An effort was made to destroy the mucous membrane in the pedicle by cauterizing it with nitrate of silver, but the result was not very satisfactory; the canal remained open for a period of nine weeks after the operation, when it became obliterated by the surrounding granulations, and the wound finally closed a week later.

During the interval from the third to the seventh week after the operation small quantities of faecal matter passed out of the appendicular orifice at various times, as it did in the preceding case, showing that it is quite a common occurrence for faeces to pass from the colon into the appendix. I will here present for your inspection the last patient spoken of and his appendix, with the faecal concretion that caused its perforation. You will observe that the appendix is about four inches and a half in length, and presents a ragged perforation at its extremity. The faecal concretion is half an inch long and a quarter of an inch

in diameter. This case represents a not uncommon feature of appendicular inflammations, in which the abscess develops at a considerable distance from the normal site of the appendix, and which in itself would be misleading if we did not bear in mind the great variety of irregularities connected with this disease. When I first saw this patient he stated that the pain was in his right side, and the tumor was virtually in the right loin, with little or no tenderness over the abdomen or at McBurney's point.

The appendix was found adherent to the lateral abdominal wall with its extremity upward. The plastic inflammation which accompanied and followed its perforation protected the peritoneal cavity from septic invasion and limited the suppuration to a small portion of the parietal peritonæum.

It may be considered imprudence on my part to advise an operation on a patient who had not yet received any treatment whatsoever, who was sufficiently well to walk to my office, and whose symptoms were apparently so mild in character. Why not try milder treatment first and watch its progress? The inflammation and swelling may subside and the dangers of an operation be avoided. I admit that up to the last few years such a course would seem proper for me to pursue, but, in the light of our present knowledge, I would feel guilty of neglect of duty if by delay I failed to give the patient the benefit of my best judgment in the case. Considering the history, symptoms, and palpable signs, I believe there was more danger in delay than in a prompt and radical operation. One of the possible results of delay in this class of cases is illustrated by the following case:

CASE V.—On January 22^d of this year I was called by Dr. Alexander Koch to see Mrs. S., aged thirty-seven years, who was then in the fourth month of pregnancy and had enjoyed good health up to about two months before. At that time she began to have pain in the right iliac fossa and above the crest of the ilium, which was accompanied by considerable nausea and occasionally vomiting. The pain was quite constant but not

severe in character, and, as she presumed it was due to her pregnant condition, she paid no attention to it, but continued to perform her household duties for the following five weeks. During that time her bowels were very much constipated and required large doses of cathartic medicines to produce any movement, and every movement was attended with a feeling of weakness, nausea, and sometimes vomiting.

Since the second week of the attack she could lie on her right side with comparative comfort, but turning over on her left side would cause a dragging, painful sensation across her abdomen which compelled her to leave that position. This is a symptom which I have frequently observed in cases of appendicitis, but, so far as I know, has not yet been mentioned by any other writer on the subject. It is probably produced by the gravitation of the intestines from the right toward the left side, thereby making traction at the point of inflammation, thus producing the symptom alluded to. About the fifth week she noticed a swelling in the right iliac fossa which gradually increased and extended backward along the crest of the ilium. Shortly after this a lameness in her right hip, as she termed it, supervened, and she was obliged to keep her right thigh partially flexed and lean forward while standing or walking. She allowed a period of seven weeks to elapse before calling the attention of a physician to her trouble, and then only permitted him to prescribe for her without making an examination. Two days before calling me Dr. Koch examined her and found a swelling which I will presently describe, and informed her husband that her affliction was of a serious nature.

On my arrival I found her sitting up and noticed that she presented a sallow, muddy complexion, and that in walking to the bed she leaned forward and limped as if the right limb were shorter than the left. Dr. Koch informed me that her temperature was 98° in the morning and 100.4° in the afternoon. Pulse was 104, soft and weak. An examination revealed the presence of a tumor in the right side occupying the space between the lower border of the ribs and the crest of the ilium, extending downward and forward to its spine anterior superior and to the outer margin of the right rectus abdominis and backward to the

quadratus lumborum muscle. The tissues covering this tumor were very tense and light pressure elicited acute pain. Guided as much by exclusion as by direct information, I ventured the opinion that this tumor was a paratyphlitic abscess, but, as I was not positive of my diagnosis, I requested Dr. J. D. Rushmore to see the case with us.

Dr. Rushmore responded promptly, and, after an examination of the case, stated that he was inclined to treat the disease as an abscess, but indisposed to express an opinion in regard to its aetiology.

An exploring needle was inserted just above the crest of the ilium about an inch in front of the quadratus lumborum muscle, and, as the appearance of pus confirmed the diagnosis, a scalpel was introduced along the needle into the abscess cavity and a quart or more of fœtid pus evacuated.

The opening was enlarged longitudinally to about an inch and a half in length, and subsequently the abscess cavity was irrigated with a warm solution of chloride of sodium, a drachm to the pint, and a drainage-tube left in the wound. The next day the patient was bright and comfortable and very grateful for the relief which she experienced. The abscess cavity was then curetted and considerable necrotic tissue removed. On introducing the forefinger through the wound, several pockets were found posteriorly, but the greater portion of the abscess cavity was in the right iliac fossa, between the caput coli and the ilium, and its inner wall was felt extending upward along the ascending colon. The cavity was daily irrigated and loosely packed with iodoform gauze, and it soon presented a healthy granulating surface. The general health of the patient improved rapidly and her complexion became clear and ruddy. The posterior portion of the abscess cavity closed within a week, that portion in the iliac fossa rapidly filled up with healthy granulations, and the wound healed by the end of the third week. Although it is only twenty-three days since the opening was made, the patient is restored to the enjoyment of good health in every respect.

While we have not been able to demonstrate that this is a case of appendicitis, I have no doubt now about the

propriety of reporting it as a paratyphlitic abscess with an aetiology quite similar to the preceding case. It is a good illustration of how generous and conservative Dame Nature can act in constructing an abscess wall which not only preserved the life of this woman, but that of the fœtus *in utero*. A description of the various forms of appendicitis would be incomplete if that variety in which septic peritonitis rapidly follows the onset of the attack were omitted.

Within the last year I have witnessed two cases of that class, but am not in possession of the history or symptoms of either case, and only know that the abdomen was opened within a few days after the prominent symptoms were recognized, and that a large quantity of pus was found in the general peritoneal cavity in each case.

The vermiform appendix was diseased in both cases, but whether the septic peritonitis resulted directly from a perforation of the appendix or the rupture of a perityphlitic or paratyphlitic abscess I am unable to say. I simply mention these facts as an illustration of the insidious character of this most serious form of the disease.

As this paper has already exceeded the limits of my original intentions, I will refrain from any further remarks on the medical treatment of this multiform disease and refer to only one point in the technique of the operation of appendicectomy, if I may be permitted to apply the term, which Dr. Rushmore suggested for the operation at one of our meetings in 1891.

It is worthy of reflection that the recovery in Cases III and IV, reported in this paper, was very much delayed by the failure of the ligatures to effect a permanent occlusion of the canal in the stump of the appendix. This is explained by considering the anatomy of the tissues entering into the structure of the appendix and its pathological surroundings at the time of the operation.

We know that a ligatured stump will not become encapsulated in an open wound attended with more or less suppuration; consequently the ligature must either become absorbed or slough away, and, as the mucous surfaces of the canal can not unite, its closure can only be effected by the slow and uncertain process of granulation from and about its extremity. For these reasons I do not deem it good surgery to apply a ligature of any kind to the vermiform appendix, although it has been extensively practiced by the eminent surgeons who have been pioneers in this special line of surgical work, and is described as the proper treatment in a recent publication—*An American Text-book of Surgery*. I consider it better practice to operate in accordance with the method adopted by Dr. Robert T. Morris and described by him in the *New York Medical Journal* of October 15, 1892, and in the *Medical Record* of January 14, 1893.

The points which I desire to emphasize in this operation may be briefly outlined as follows:

Cut off the appendix quite close to the cæcum, ligate or suture the protruding collar of mucous membrane, invert the remaining portion of the stump so that the peritoneal surfaces come together, scarify the peritoneal margins to secure their firm adhesion, and close the opening with cat-gut, using the Lembert suture.

By this method, where the tissues are sound and it is possible to pursue this plan, a much more rapid closure of the wound may be obtained, and there will be no diverticulum remaining to invite further trouble.



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