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Addresses.

THE CAUSE OF DIFFUSE PERITONITIS COMPLICATING APPENDICITIS AND ITS PREVENTION.

CHAIRMAN'S ADDRESS, DELIVERED BEFORE THE SECTION ON
SURGERY AND ANATOMY, AT THE FIFTY-SECOND ANNUAL
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Every surgeon who treats patients suffering from acute appendicitis must be impressed with the fact that an unfavorable outcome in any given case means that the infection which was originally confined to the small space occupied by the vermiform appendix itself has first invaded the tissues immediately surrounding this organ and has then been distributed over the entire peritoneal cavity. In other words, in fatal cases the patient practically always dies as the result of a diffuse peritonitis.

Other conditions may arise which may result in a fatal issue. There may be a septic thrombosis of the vessels in the vicinity of the appendix or an empyema, or even pyemia, but by far the greatest number of deaths occurs from diffuse peritonitis, and if it is possible to prevent this, the mortality from appendicitis must at once fall enormously. In order to plan a means for the prevention of this condition, it is well to study the progress of the disease from its onset.

There is danger of the occurrence of diffuse peritonitis in the following classes of cases: 1, in gangrenous appendicitis; 2, in perforative appendicitis; 3, in cases in which the cecal end of the lumen of the appendix is closed and the distal portion so thoroughly distended with septic material as to make its walls permeable to micro-organisms; 4, in the very rare cases in which there are small abscesses in the walls of the appendix not directly connected with its lumen, and 5, in cases in which there is a septic thrombosis of some of the vessels, but not sufficient to cause gangrene.

The first, second and third conditions are so common that every surgeon who operates frequently during the acute attack has seen them many times.

Were it possible to keep the septic material in these cases within the circumscribed area in which it occurs primarily, it is plain that the condition would remain comparatively harmless.

ANATOMICAL CONDITIONS INVOLVED.

The appendix is virtually surrounded on all sides excepting in the direction of the median line by relatively fixed tissues. Above we find the lower end of the cecum and the cecal end of the ileum; to the right and in front is the parietal peritoneum; behind the peritoneum

covering the iliacus muscle, and toward the median line it is surrounded by loops of small intestines. Moreover, the omentum extends far beyond its lower end.

It is true that the appendix may be displaced downward, but in this case it will again be surrounded by fixed tissues which seem especially adapted to dispose of septic material. Again in this case there is an enteroposis affecting the cecum, and always with this a marked lowering of the transverse colon and stomach and with these the omentum.

Thus we see that the natural anatomical arrangement for the protection of the general peritoneal cavity is extremely efficient. There is but one weak point in the anatomical provision for this protection, namely, in the direction of the median line, because the great mobility of the small intestines naturally favors the distribution of septic material to all parts of the peritoneal cavity.

If we can prevent the small intestines from doing harm in this direction, we will have accomplished our end, theoretically at least.

At this point I wish to direct your attention to another important anatomical condition. The blood supply of the omentum is so enormous that it will readily dispose of a very severe infection by walling off the surrounding structures if it is permitted to give its physiological attention to a single area.

It is a well-known fact which every one who frequently operates during the acute attack of appendicitis has had many opportunities to observe, that the omentum crowds itself about any inflammatory or traumatic lesion within the peritoneal cavity the moment the latter occurs, and if left undisturbed, a few hours will suffice to cause efficient protective adhesions.

These adhesions become stronger every hour and the blood supply in the omentum becomes greater, so that if no disturbance arises one can reasonably expect efficient protection to the general peritoneal cavity from the omentum.

Another important fact must not be lost sight of in this connection. The fact that the surrounding structures are relatively fixed in position favors the condition of rest of the inflamed part and permits the omentum to act after the manner of a splint applied to an inflamed joint. The value of rest as a preventive to the extension of an infection in any part of the body can not be overestimated. Consequently if it is possible for us to secure this condition of rest we have gained another important point in the right direction.

In case the appendix is displaced upwards its position is even more favorable, because the available amount of omentum is thus increased. Again, if the appendix is retrocecal in its position, which is very frequently the case, the infection of the general peritoneal cavity is more easily prevented than when in its normal location. If anteriorly misplaced, it is likely to be fastened to the anterior abdominal wall by the adherent omentum.

PERISTALTIC MOTION OF THE SMALL INTESTINES.

It is plain, then, that the infection of the general peritoneal cavity must occur from a disturbance on the part of the small intestines, and must be due to their peristaltic motion.

It is significant that in almost all cases of severe acute appendicitis the obstruction to the passage of gas and intestinal contents through the ileo-cecal valve is one of the early symptoms. Nature is trying to prevent this very dangerous disturbance by closure of the ileo-cecal valve. We have a condition corresponding to the contraction of the muscles surrounding an inflamed joint, to the closure of the eyelids in conjunctivitis, etc. Moreover, the muscles overlying the appendix become tense. Everything tends toward the establishment of conditions of rest in the vicinity of the inflamed organ.

THE EFFECT OF THE INTRODUCTION OF ANY KIND OF FOOD OR CATHARTIC INTO THE STOMACH.

It is a fact which has been demonstrated a great number of times that peristalsis does not occur unless food or cathartics are introduced into the stomach. If the attack occurs shortly after a meal and before all of the food has passed through the ileo-cecal valve, its presence may cause peristaltic motion in the small intestines. Upon reaching the ileo-cecal valve the latter may prevent its passage into the cecum, causing return peristalsis, and the intestinal contents are forced back into the stomach, whence it may be expelled by vomiting or be again forced into the small intestine, giving rise to further peristaltic motion. Moreover, it will give rise to the formation of gas, which must cause disturbance and pain in its attempt to pass the ileo-cecal valve.

This motion, it is plain, will be harmful primarily from the fact that it gives rise to pain by disturbing the sensitive inflamed tissues; and secondarily from its likelihood of carrying infectious material with which it has come in contact in the vicinity of the inflamed appendix to other parts of the peritoneal cavity.

Besides this the physiological attention of the omentum can now no longer be directed to the single area of infection, because other parts of the peritoneal cavity require its protection, and such portions of the omentum as are not yet thoroughly adherent about the inflamed appendix are likely to be diverted from this point.

Theoretically, then, the disturbance which is to be feared to so great an extent is caused by the presence of food or cathartics in the stomach, and its logical remedy would be to absolutely prevent the introduction of any form of food or cathartics into the stomach and the removal by gastric lavage of any portion of food which may be retained in the stomach at the beginning of the attack. It may be necessary to perform gastric lavage twice or at most three times in order to entirely remove remnants of food which may have regurgitated into the stomach from the small intestines by reason of return peristalsis.

That this is not only true theoretically, but also in practice, I have demonstrated in a large number of cases; and many other surgeons who have followed the same plan of treatment have informed me of the fact that their experience has agreed with mine.

It is true that a few surgeons have reported failures with this method, but an investigation of their treatment in each instance has shown that they disregarded one of the three cardinal points in the treatment. They either gave just a little liquid food by mouth, or they gave some form of cathartics, or disturbed the rest of

the intestines by giving large enemata, or they neglected removing the stomach contents by gastric lavage.

Of course, the slightest amount of food is sufficient to start peristaltic motion of the small intestines, and the same is true of cathartics, and consequently if either of these features in the treatment is omitted one can not hope for the same results.

It does not matter what form of appendicitis may be present in any given case it seems clear that this form of treatment must be useful, because in the milder cases it will result in rest of the affected part, and consequent rapid resolution; while in the severe cases it will guard against mechanical distribution of infectious material, and in all cases it reduces the tendency to meteorism and stops the pain.

There is, however, one class of patients in which I have found this treatment of the greatest value. I refer to the class in which the appendix is gangrenous or perforated and in which there is already a beginning general peritonitis. These patients give the impression of being extremely ill. There is complete obstruction to the passage of gas or feces. There is nausea or vomiting and marked meteorism; the pulse is small and quick; usually there is high fever, but the temperature may be subnormal; respiration is rapid, and the abdominal muscles overlying the appendix are tense. The patient is in a condition in which I formerly operated at once, day or night, as a last resort, only to find that it was too late in more than one-third of the number of cases, the mortality increasing with the time that had elapsed since the beginning of the attack. In this class of cases there is still a recovery of over 90 per cent. if the principles laid down above will be thoroughly applied.

If peristalsis is absolutely inhibited, as it can be, the infection will still become circumscribed and the pus can be evacuated with safety. Moreover, the condition I have just described is in itself the result of the administration of food and cathartics. Had these patients received neither food nor cathartics from the beginning of their attack, the condition would never have advanced to this dangerous point. This refers particularly to a class of cases which Richardson has so well described as being "too late for an early and too early for a late operation."

If the plan I have outlined above is carried out, the following changes are likely to occur: The nausea and vomiting will cease after one or two, or at most three, gastric irrigations. The meteorism and the pain will decrease greatly during the first twelve hours and will almost completely disappear in twenty-four hours. The pulse becomes slower and firmer and more regular, the breathing deeper and the patient's general appearance improves to an astonishing extent. If the temperature was high, it will go below 100 F. the first twenty-four hours, and in three days it will be practically normal. The abdominal muscles will become soft as soon as the stomach contents have been removed by gastric lavage.

Usually the improvement is so rapid that one is tempted to spoil everything by giving nourishment by mouth, because the patient's condition does not seem serious enough to warrant such severe measures.

That this form of treatment, which I have employed since 1892, at first only in selected cases, and later more and more generally, is really of great value is shown by clinical results. My mortality in cases of perforative or gangrenous appendicitis with beginning diffuse peritonitis is less than one-fourth as high as it was in the cases operated at once upon making the diagnosis, and even in advanced cases of diffuse peritonitis there has

been a marked decrease in the mortality in my experience.

It might be said that these cases were not due to perforative or gangrenous appendicitis, but that they were simply severe catarrhal cases, which are known to result favorably under any form of treatment. To this I would respond, that I have later removed the appendices in many of these cases and have almost invariably demonstrated the correctness of the diagnosis.

In my statistics I utilize only the cases which I have operated in the Augustana Hospital, because of these I have full and accurate records, while of those operated in other hospitals and in private homes my records are not accurate, because there the patients and assistants are not so completely under my control.

From Jan. 1, 1898, to May 1, 1901, I have operated in this hospital upon 565 appendicitis cases, which I have divided into three groups: 1, those who entered the hospital suffering from diffuse peritonitis; 2, those who entered the hospital suffering from gangrenous or perforative appendicitis, and 3, those who entered the hospital suffering from recurrent appendicitis in the interval between attacks or at the beginning of a recurrent attack when the infectious material was still confined to the appendix. Of the first class I treated 18 cases, with 10 deaths, 55.5 per cent. mortality; of the second class I operated 179 cases, with 9 deaths, 5 per cent. mortality; of the third class I operated 368 cases, with one death, 1/3 per cent. mortality. Total, 565 cases, with 20 deaths, 3.5 per cent. mortality.

These statistics contain all patients who entered the hospital suffering from appendicitis; even those who died few hours after admission. from general peritonitis, a

Of classes 2 and 3, all were operated, so there can be no doubt concerning the diagnosis. Of class 1 all but 4 were operated, and these were in an absolutely hopeless condition when they entered the hospital. I will state also that during this time no patient suffering from appendicitis was refused admission into the hospital.

Judging from the authorities upon this subject, our mortality of 55.5 per cent. in diffuse peritonitis is as low as that recorded by any of the authors whose statistics contain a considerable number of these cases, while some authors with less than half this number report as low as 20 per cent. mortality. Krogius has compiled the statistics of 58 authors whose combined mortality is a little over 70 per cent.

As compared with my own experience in former years, when all of these cases were treated surgically at once, my experience in this series of cases of diffuse peritonitis following appendicitis is quite encouraging.

It is in the second class, however, in which the greatest benefit from the treatment is found. In this class, according to most modern authorities, Murphy, Mynter, Porter, Lennander, Bull, and many others, there is a mortality of at least 20 per cent. This in my cases has been reduced to 5 per cent.; and had the treatment been instituted at the beginning of the attack, I am certain that the mortality could easily have been reduced to one-half of this. In class 3 there should have been no death. Many of these cases had been treated through their acute attack by the method I have described, before being sent to the hospital. But as not all of the cases I treated outside of the hospital came later to operation, it is not fair to utilize these in demonstrating the value of the method.

Again, I have treated a large number of cases through the acute attack of appendicitis with this method which have never been operated and which I have not included

in my statistics, because the correctness of the diagnosis could not be established by actually demonstrating the condition present in the appendix.

However, the fact that there was a mortality of less than one-third per cent. in so large a number of cases is significant. It shows the value of a method by which cases of acute appendicitis in whom an operation is bound to give a high mortality at best, can be changed to chronic appendicitis in which the mortality following operation is almost nothing.

It would require too much space to tabulate all the cases treated by this method, but in order to give a clear idea of the character of these cases I have appended the histories of the cases suffering from perforative or gangrenous appendicitis which were treated through the acute attack during the past four months in the Augustana Hospital by means of the method I have described, and in which the correctness of the diagnosis was subsequently demonstrated by removing the diseased appendix during the operation.

In the same time I have treated many cases of acute perforative or gangrenous appendicitis in consultation with other physicians in private houses, but as these diagnoses have not been proven by the removal of the diseased organs they cannot be included in this list, although they corresponded with those who were operated both as regards the outcome and the conditions present during the attack, and there can be no reasonable doubt regarding the diagnosis.

It is, of course, not possible to come to any definite conclusions from a collection of statistics, because there are so many differences which can not be balanced.

One hospital may be largely filled with patients from the lowest and least intelligent classes, which would indicate that the patients enter only after they are in an exceedingly serious condition. Another hospital may have a more intelligent class, and hence the cases are in a more favorable condition at the time of admission. Again, as an institution becomes known for the treatment of these cases, a larger number of relatively hopeless cases will be sent there, hence I believe it is practically impossible to draw fair conclusions from statistics, and one must depend largely upon personal experience.

Among these cases, No. 8896 is especially instructive, because it illustrates the danger of operating too early. The patient entered the hospital five days after the beginning of the attack. His condition was exceedingly grave, as indicated in the history. With an immediate operation I should have expected his death within thirty-six hours.

The diagnosis was made of gangreneous appendicitis. He was placed on exclusive rectal feeding. Within twenty-four hours his pain had entirely disappeared, his general appearance improved greatly, the meteorism subsided, his temperature fell 3 degrees, his pulse came down forty beats per minute, his abdominal wall became soft, and twenty-four hours later I began to doubt my diagnosis. At the end of the fourth day his condition had improved so much that, upon his request, I concluded to operate, because he was normal in every respect with the exception of a slight induration in the region of the appendix and pain upon deep pressure. It seemed to me as though the process must have stopped just short of a perforation. Had he been left without an operation there could be no doubt but what he would recover temporarily from his attack. It seemed perfectly safe to operate.

Upon opening the abdomen I found a perforated gan-

grenous appendix surrounded by a small abscess completely walled off by the omentum. I removed the appendix and the surrounding pus with great care and drained the cavity, expecting the patient to recover, but a diffuse peritonitis developed, from which he died five days later. This case impresses the lesson, that it is not wise to operate until the patient has fully recovered from the acute attack. Of course, he should be cautioned as regards his diet in order to prevent a recurrence, but I am confident that the mortality in my practice will be still smaller in the future, especially because I shall wait longer after the acute attack before removing the appendix.

The danger of rupture of a circumscribed abscess into the general peritoneal cavity has been the cause of great anxiety. My experience has led me to conclude that this practically never happens unless food or cathartics are given by mouth. In my entire experience it has happened but once, in a child 7 years old, which was brought to the hospital on the fifth day after the beginning of an attack of gangrenous appendicitis with beginning diffuse peritonitis. It had received food and cathartics constantly since the beginning of the attack, and although its condition seemed hopeless either with or without an operation, it improved slightly from day to day under exclusive rectal feeding, but never became well enough to make drainage of rather an extensive infection of the entire area between the umbilicus and pubis and right anterior superior spine of the ilium safe, and still, had I anticipated the likelihood of a rupture into the remaining portion of the peritoneal cavity, I should certainly have made the attempt with the hope of bringing about a recovery.

On the fifth day the abscess suddenly ruptured. I anesthetized the boy within half an hour, made a free incision, washed out the peritoneal cavity, drained freely, but the child died in six hours.

In this case gastric lavage had not been employed because the child was very nervous and we feared the effects of the fright.

I have frequently seen cases in which food and cathartics were given in whom this accident occurred.

Aside from the benefit to the patient of increased safety there are other advantages to be derived from this plan of treatment, which are well worth considering. Being able to operate during the quiescent state, drainage is not indicated, and consequently there is no likelihood of the occurrence of post-operative ventral hernia. With the reduction of the area of infection, the amount of peritoneal adhesions must necessarily be reduced. As a matter of experience, I can say that fecal fistulæ almost never occur in cases treated by this method.

Of course, all these advantages, as well as the prevention of diffuse peritonitis, can be accomplished if the appendix is removed during the very beginning of the attack, before the infectious material has passed beyond the walls of the appendix, but unfortunately it is but very seldom that a patient enters the hands of a surgeon at so early a stage.

The following consecutive histories illustrate the class of cases in which the form of treatment is indicated and also the progress of these cases under this form of treatment. The number at the beginning of each history is for the purpose of identification in the Augustana Hospital records.

No. 8573.—Master Harold B., school boy, 7 years of age, operated on Jan. 9, 1901, gave the following history: He had whooping cough at 3 weeks of age, otherwise he had been well. Fifteen months ago patient was taken with headache,

vomiting, pyrexia 100 F., and pain in abdomen only on pressure in right inguinal region. Then perfectly well until six weeks ago, when patient was again taken with headache, vomiting, pyrexia and tenderness in right inguinal region. The abdomen was severely distended with gas. The attack was much more severe than the first one. Patient placed upon exclusive rectal alimentation for two weeks. Headache and vomiting left him in a day, but tenderness has persisted, and he has usually had slight evening rise of temperature of about 100 F.

Present Condition: Well developed, fairly well nourished, slightly anemic, temperature 99.4, pulse 90, regular and strong. Appetite good, bowels constipated, heart and lungs normal. Abdomen slightly distended, quite tympanitic, except lower portion of left inguinal region. At times tenderness at right inguinal region.

Treatment: McBurney's incision 6 cm. long. Appendix 7 inches long, curved on itself back behind to cecum, is adherent to posterior surface of cecum. Appendix is ulcerated to an extent approaching perforation, contains several concretions. The lymphatics in the mesentery are enlarged to size of army bean. Appendix crushed with strong forceps at cecal end. Stump inverted with silk purse-string suture. No drainage. Wound closed. Dry dressings. Straps. Patient recovered normally, leaving hospital Feb. 5, 1901.

No. 8582.—Master Jerome R., 8 years of age, operated on Jan. 28, 1901, gave the following history: Patient experienced the ordinary diseases of childhood. At the age of 1½ years he had peritonitis and was very ill for three weeks. On Jan. 1, 1901, he felt indisposed, having eaten an unusual amount of nuts the night before, and on the following morning he suffered from severe pain in the abdomen, accompanied with vomiting and diarrhea. The pain was paroxysmal in character, became located in the right inguinal region on the second day. The bowels became distended with gas, and after the first day there was complete obstruction to the passage of gas and feces. Vomiting persisted for five days, until patient absolutely refused to take food, when the vomiting ceased. Entered hospital Jan. 9, extremely ill with diffuse peritonitis. The abdomen was greatly distended with gas and extremely tender. Temperature 102 F., pulse 120. He was placed on exclusive rectal alimentation, whereupon he improved rapidly. On January 17 his pulse and temperature were normal, his abdomen was but very slightly distended, his complexion and facial expression were good. There was slight tenderness in the hypogastric and right inguinal region. His heart, lungs and kidneys were normal. He was now given beef-tea by mouth, but the rectal alimentation was continued. There was an area of induration in the vicinity of McBurney's point which persisted. Exclusive rectal feeding was continued for three weeks.

On Jan. 28, 1901, four weeks after the beginning of the attack, an abdominal section was made through the right rectus abdominis muscle 6 cm. long, opposite McBurney's point. The peritoneum was found congested, the intestines empty. In front of the right iliacus muscle was found a mass, consisting of the cecum, the omentum and the cecal end of the ileum, surrounding a circumscribed abscess containing the perforated appendix and a number of fecal concretions. The appendix was removed, the stump inverted, the wound drained with gauze and glass drains. The appendix contained a perforation 3 cm. from its end. The peritoneal cavity contained a considerable quantity of sero-sanguinous fluid. The patient left the hospital well April 2, 1901.

No. 8589.—Mr. Anton N., a fireman, 23 years of age, entered the hospital Jan. 10, 1901. He gave the following history: Aside from having experienced the diseases of childhood, he had always been well. In May, 1900, he experienced a mild attack of acute appendicitis continuing for five days. Felt well after this until 18 days ago when patient again experienced severe pain, first in the epigastric region, which became localized in the vicinity of the appendix. He suffered from diarrhea and vomiting for one day.

Under treatment with exclusive rectal diet the pain, which was at first very severe, decreased rapidly and disappeared in

five days, leaving only soreness for ten days longer. The rectal feeding was continued for two weeks.

Present Condition: The patient is well nourished, the tongue is clean, appetite good, bowels constipated, heart, lungs and kidneys normal, temperature 98.6, pulse 80, regular and strong. There is some tenderness and resistance a little below McBurney's point.

Operation: January 11. McBurney's incision 5 cm. long. Appendix coiled upon itself and adherent throughout between cecum and iliacus muscle, perforated 2 cm. from end into cecum. The wound in the latter had healed. The appendix was exceedingly brittle, edematous and congested and its lumen was almost completely obliterated at the cecal end. The appendix was removed and its stump inverted into the cecum and the space closed by purse-string suture. The abdominal wound was closed. The patient recovered normally, leaving the hospital on Feb. 12, 1901.

No. 8630.—Mrs David B., 46 years of age, was operated on Jan. 23, 1901. The patient is so deaf that it was difficult to obtain a history. She has been married for 22 years, has had seven pregnancies, the last one 10 years ago. Has had two miscarriages. For several months she has suffered from incomplete intestinal obstruction, accompanied with nausea and eructation of gas and indefinite pain in the abdomen. A diagnosis of chronic appendicitis had been made, but during the past two weeks her condition has been more serious, her deafness, however, makes it impossible to obtain a definite history except that she is and has been very ill. Her facial expression is bad, her abdominal walls tense. She complains of pressure over the entire abdomen, but especially over the region of McBurney's point and in the region of the sigmoid flexure of the colon. She had traveled a distance of 400 miles by rail and was extremely exhausted. She was placed in bed and given exclusive rectal alimentation for four days. Her heart, lungs and kidneys were normal and her general condition improved under this treatment, under which she had been for a week before entering the hospital. An exploratory incision 5 inches in length was made in the median line and the appendix was found surrounded by omentum. The former was perforated a short distance from its distal extremity and at this point was found a small abscess containing a dram of pus and an enterolith. The appendix was removed, together with the portion of the omentum containing the abscess. The patient developed a pneumonia four days after the operation from which she recovered as well as from her operation. She left the hospital March 9, 1901.

No. 8699.—Miss Freda W., 20 years of age, operated on Feb. 3, 1901, gave the following history: Patient has experienced all of the children's diseases. At the age of 9 she injured her knee-joint by falling upon broken glass. The wound became infected and patient was extremely ill for several months, recovering with an ankylosed joint. Menstruated at 13, regular and painless for two years, since then has suffered considerable pain, more especially in the right side, lasting from two hours to two days at each period. For the past four years, patient has been anemic, nervous and not very strong. Seven months ago she began to have occasional pains in the region of McBurney's point at intervals of about two weeks, most severe, however, during menstrual period. Her appetite was bad, her digestion impaired, her nervousness increased. About Nov. 1, 1900, the pain became persistent and was accompanied with nausea and eructation of gas.

On December 16 patient suffered from an exceedingly violent, acute attack of appendicitis, characterized by extreme pain, nausea, vomiting and a distinct chill, pulse increased to 130 per minute, temperature 100 F. No food of any kind was given after the beginning of the attack. She was kept on exclusive rectal alimentation for ten days. One hypodermic injection of one-fourth grain morphia was given the first day. The pain subsided within twenty-four hours, but the patient's general condition was bad on account of the severeness of the attack. There was tenderness in the vicinity of McBurney's point for two weeks, which continued upon pressure until the time of the operation. Ten days after the beginning of the attack she was given beef-tea by mouth for four days, then

liquid diet for two weeks, then light diet until the time of the operation.

Present Condition: Fairly well nourished, but anemic, appetite fair, bowels regular. Eructations of gas after eating. Heart, lungs and kidneys normal. Slight pain in the region of McBurney's point upon deep pressure. Ankylosis of right knee at angle of 165 degrees.

Treatment: McBurney's incision 6 cm. long. Appendix found severely congested, its lumen reduced to one-fourth its normal size at the cecal end. The distal end somewhat club-shaped, contained four fecal concretions. The mucous membrane of the appendix was ulcerated. The appendix was universally adherent, the adhesions being soft and due to the recent attack. Appendix removed, stump buried with purse-string suture. Abdominal wound closed. The patient recovered normally, leaving the hospital three weeks after the date of operation.

No. 8757.—Master Herman M., 5 years of age, operated on March 1, 1901, gave the following history: At 3 years of age he had measles and scarlet fever. In August, 1900, he was sick for several weeks with pyrexia and pain in the region of the umbilicus. Fairly well after this until two weeks ago patient had a slight attack of diphtheria; antitoxin was immediately administered and child became well in a few days. One day before admission, patient was dull, sleepy and feverish. That night he vomited some. Magnesia was given, this was followed by colicky pain in abdomen. Pain in region of umbilicus persisted.

Feb. 19, 1901. Since admission temperature has ranged from 100 to 104 F. Patient has had the appearance of being extremely ill.

Present Condition: Considerably emaciated. Sordes of teeth. Teeth badly decayed. Tongue slightly coated. Quite hungry. Temperature 102, pulse 130, regular and strong. Heart and lungs and kidneys normal. Complaints of pain in region of umbilicus. Some tenderness there and in right inguinal region. Spleen not enlarged.

Treatment: Exclusive rectal alimentation for three weeks. McBurney's incision 5 cm. long. Appendix found bent by two bands of adhesions. Appendix congested and filled with dark, bloody fluid. Appendix removed in usual manner and stump buried with purse-string suture. Wound closed. Patient recovered normally, leaving the hospital March 29, 1901.

No. 8767.—Mr. Andrew B., a laborer, 36 years of age, admitted Feb. 19, 1901, gave the following history: At 13 he suffered from an attack of diphtheria, otherwise he has been well, with the exception of having occasional slight stomach disturbances. In December, 1900, he had pain in lumbar region, which patient thought was rheumatism. He stopped work for a few days. On Jan. 23, 1901, he began to feel ill, an hour later had a chill followed by vomiting and abdominal distention. Diffuse abdominal pains. January 28 pain became localized in right inguinal region and on the 29th he had marked pyrexia. Confined to bed about two weeks, since then quite well, except some soreness in right inguinal region.

Present Condition: Fairly well nourished, 30 pounds under weight, tongue slightly coated, appetite good, but if he takes nourishment there is an increase in the pain and gaseous distention and patient experiences nausea. Patient has the appearance of being very ill, although he has been out of bed and able to walk about a little. Heart and lungs normal. Abdominal wall thick. Considerable resistance and marked tenderness in right inguinal region. Considerable gaseous distention.

Treatment: Patient placed on rectal alimentation for three days, mainly for the purpose of overcoming the gaseous distention, previous to performing the operation. Operation February 22. McBurney's incision, which was lengthened by extending incision along outer border of rectus abdominis. Appendix found adherent in a mass, and perforated 3 cm. from cecum. Appendix loosened from adhesions and removed. Stump buried with purse-string suture. Primary incision closed. Counteropening made opposite anterior superior spine and glass tube and gauze drainage inserted. Wet dressings. Patient recovered normally and left the hospital April 8, 1901.

No. 8836.—Mr. Chas. A., an engineer, 33 years of age, ad-

mitted March 5, 1901, gave the following history: He had experienced the diseases of childhood, otherwise he had been quite well. Twelve days ago was taken with a diffuse pain in abdomen, not very severe, able to be about, no vomiting or constipation, but nausea. Ten days ago was taken with severe pain, colicky, all over abdomen, severe nausea, but no vomiting. About one day later, pain localized in right inguinal region. Improved slowly under treatment with exclusive rectal alimentation and four days ago was able to be up. Two days ago pain recurred after eating a little, whereupon nourishment by mouth was again prohibited for five days.

Present Condition: Fairly well nourished, tongue thickly coated. Temperature 98.3, pulse regular and strong. Heart and lungs normal. Considerable resistance and tenderness in right inguinal region.

Operation: March 8, 1901; McBurney's incision. The appendix was found adherent to the lower end of the cecum and the anterior surface of the iliacus muscle and surrounded by the omentum. It was bent upon itself in the form of an interrogation point, club shaped at its distal end and perforated near its end and surrounded by a slight amount of pus. Appendix removed, wound drained. Patient recovered normally, leaving the hospital April 12, 1901.

No. 8872.—Maurice R., 13 years of age, school-boy, entered hospital March 13, 1901, giving the following history: The family history is good with the exception that father has suffered from an attack of appendicitis, one sister was operated for recurrent, non-perforative appendicitis and one brother for acute perforative appendicitis complicated with diffuse peritonitis. The patient has always been well with the exception of having an attack of typhoid fever two years ago, and one year ago had a severe pain in right inguinal region with slight pyrexia. Pain severe for about two days, since then has not felt very well, having a constant grumbling pain in right side. About twenty-four hours ago was seized with a sudden pain in right side. Pain very severe up to present time. Being under the direct care of his sister, who had experienced severe attacks of recurrent appendicitis, feeding by mouth was at once prohibited.

Present Condition: Fairly well nourished, general condition good. Considerable rigidity and tenderness in right inguinal region.

Treatment: McBurney's incision. Proximal end of appendix constricted, distal end enlarged, curved on itself in the shape of a question mark. Surface covered with lymph. Removed: stump buried; wound closed. The end of the appendix contained a hard fecal concretion and pus. The mucous membrane was ulcerated and the end of the appendix appeared as though it were about to perforate. The appendix was surrounded by the omentum, which had already become attached by a fine layer of plastic lymph, completely separating the infected organ from the remaining portions of the peritoneal cavity. The patient recovered normally and was discharged from the hospital April 2, 1901.

This case is interesting especially because it shows how early after the beginning of an attack the general peritoneal cavity will be protected against infection.

No. 8879.—Miss Hanna J., a housemaid, 26 years of age, came under my care March 14, 1901, giving the following history: Two brothers and father had stomach trouble, otherwise family history was good. She had had the ordinary children's diseases, otherwise well. Began to menstruate at 14, regular and painless. For several years patient has complained of bilious attacks, coming one to four times a year. During these attacks she was taken with fever, vomiting and some pain in epigastrium, lasting from one to three days, leaving a soreness in epigastrium. About one year ago, patient had a more severe attack than usual. Patient was taken with vomiting, pain, pyrexia and pain in epigastrium, which radiated to right inguinal region, leaving a soreness there. The attack lasted three days. October, 1900, had a similar attack, but not so severe. Eight weeks ago, patient was taken with pain in stomach, about five hours later began to vomit, the pain becoming more severe. A few hours later radiated to right inguinal

region. No pyrexia. This lasted about three days, then patient got up and was around for four days when she began to feel badly again but was not compelled to go to bed for three days after this, when she was confined to bed for two weeks with pyrexia. Was given no food by mouth for ten days. Pain and soreness in right inguinal region. She said she could feel a mass in right inguinal region the size of a goose egg.

Present Condition: Well nourished, slight coat on tongue, appetite good, bowels regular, temperature 99, pulse 62, regular and strong. Heart and lungs normal, abdomen not distended, no abdominal dullness on palpation, slight tenderness and resistance in right inguinal region.

Operation: March 15; incision through right rectus abdominis muscle 19 cm. long. Appendix perforated and universally adherent. Appendix removed and wound closed. Recovery normal, patient discharged from hospital April 9.

No. 8896.—Mr. Oscar L., a factory worker, 21 years of age, came under my care March 18, and gave the following history: He had had measles as a child, and at 12 had some trouble with left hip which confined patient to bed for thirteen weeks. March 21, 1901, nine days ago, had slight diffuse pain in abdomen for two hours, after that felt perfectly well until five days ago when supper did not taste very well and at 10 p. m. that night began to have slight pain in abdomen, then severe vomiting, then pain became very severe, more pronounced in right inguinal region. Vomited all first night and following morning after taking coffee. Since then has had nothing by mouth. Vomited only once, but is still nauseated. Temperature 103 F., pulse 110 per minute.

Present Condition: Well nourished, but has appearance of being extremely sick. Tongue thickly coated, face flushed, quite thirsty. Heart and lungs normal. Abdomen considerably distended, considerable tenderness, more pronounced in left inguinal region. No dullness, quite tympanitic.

Exclusive rectal alimentation for four days. After the second day the temperature and pulse were nearly normal and at the end of the fourth day his general condition was so much improved that it seemed likely that he was suffering from a catarrhal instead of a perforative appendicitis, hence I consented to operate instead of continuing the treatment.

Operation: March 22; McBurney's incision. Peritoneum and intestines inflamed. General peritoneal cavity packed away with a large pad. Cecum and appendix loosened and a large abscess opened into. This sponged out, and perforated appendix containing a large fecal stone removed subperitoneally, clamped, ligated, removed, not covered in by purse-string suture, as cecum could not be brought up. Glass and iodoform gauze drainage. Wet dressings.

The patient died on the fifth day after the operation from diffuse peritonitis.

There is no doubt in my mind but what this patient would have recovered fully had his operation been postponed for a few weeks. When he entered the hospital his condition was so serious that it seemed certain that he would die were he operated upon at once. His general appearance was exceedingly bad. His abdomen was greatly distended with gas and exceedingly tense. His condition improved so rapidly after applying gastric lavage and prohibiting all oral feeding, that it seemed likely that our first diagnosis of perforative appendicitis must be wrong. Hence too early operation with disastrous result.

No. 8963.—Mr. Alex. S., a boy 16 years old, admitted April 1, 1901, gave the following history: He had had children's diseases, otherwise he had been well until four years ago when he had typhoid fever. Shortly after convalescence he took a severe cold, followed by pneumonia, then by empyema on right side. He has had two operations for empyema. Has been perfectly well except slight discharge from sinus on right side of chest, until two weeks ago. At this time patient's stomach troubled him a little. Six days ago in the evening after eating heartily he was taken with pain and vomiting (pain in epigastrium). Pain continued during night and then felt fairly well for next two days. Two days ago ate a hearty dinner, four hours later was taken with severe pain over lower portion of abdomen, then followed a few hours later by vomiting, which was extremely violent. The abdomen became greatly distended

with gas and patient was in a condition of severe shock. The pain at this time was diffuse and it was not possible to determine the cause of the intestinal obstruction positively. Gastric lavage and exclusive rectal alimentation were employed. These symptoms persisted about thirty-six hours, for past twelve hours has had no pain.

Present Condition: Fairly well nourished; hungry, bowels constipated, tongue coated. Pulse 104, regular and strong, temperature 99. Nothing abnormal on percussion of abdomen. Slight tenderness in median line about two inches below umbilicus.

Treatment: Exclusive rectal alimentation was employed for two weeks. Operation April 17, 1901. Incision through right rectus abdominis muscle 8 cm. long. Peritoneum found studded with tubercles and intestines adherent. The appendix and cecum are in a mass of tubercular tissue to such an extent that it was not possible to remove the appendix without leaving large raw surfaces. Consequently none of the tissues were disturbed. The free peritoneal fluid was sponged away and the abdominal cavity closed. In these cases our results have been very satisfactory whenever we have simply closed the abdominal cavity, while they have been the reverse whenever we have removed portions in cases in which it was not possible to cover the raw surfaces thus produced. The patient made a normal recovery, leaving the hospital May 17.

No. 8984.—Mr. Andrew G., 36 years old, laborer, came under my care April 7, 1901, giving the following history: Family history good. Was healthy during childhood; had diphtheria at age of 18, inflammatory rheumatism at 28 for a period of three months; had a recurrence at 31 for one month. Eighteen months ago had a varicocele operation. Nine days ago he noticed a diffuse abdominal pain, which came on slowly and continued for six days, being less severe at night, especially if the patient lay on his right side. It became localized in the region of McBurney's point. Two days ago, after taking a cathartic, the pain increased greatly and nausea and vomiting occurred and the patient became seriously ill, indicating the diagnosis of perforative appendicitis. Feeding by mouth was at once prohibited and the patient began to improve at once. The nausea and vomiting disappeared, the abdominal walls became less tense, gaseous distention decreased and his general appearance improved.

Present Condition: Well nourished; patient feels hungry; tongue is coated; flatus is expelled; temperature and pulse are normal; heart and lungs and kidneys are normal. The abdomen is asymmetrical. In the right inguinal region there is a mass the size of a hen's egg which is firm and tender upon pressure. Result of varicocele operation perfect. The improvement in the condition is attributed to the fact that no food has been given for two days. The patient was placed on exclusive rectal alimentation for eleven days. In the meantime the induration has decreased, so that now it is only the size of a walnut and not tender. In every way the patient's condition is good.

Operation: April 18, incision five inches in length through outer border of right rectus abdominis muscle. Cecum and ileum adherent to omentum. Appendix adherent behind cecum, perforated in a small abscess cavity, containing a dram of pus. Appendix very brittle, breaking several times during manipulations. Abscess cavity sponged out and drained. Wound closed. Patient recovered normally. Left hospital May 19.

No. 9000.—Mr. L. C. H., teamster, 19 years of age, came to the hospital April 9, 1901. He gave the following history: He had always been well. On April 7 he was taken with frontal headache, slept fairly well that night, but awoke feeling worse, and began to have a diffuse abdominal pain. After taking some medicine began to vomit and could not get bowels to move. Vomiting persisted, until all mouth feeding was stopped the following day. Pain persisted and became localized in right inguinal region on second day. Bowels moved with simple enema on the 10th.

Present Condition: Patient appears and feels very ill, face anxious but flushed. Well nourished, tongue coated, hungry, and especially thirsty. Heart and lungs normal. Abdominal mus-

cles held rather tense, a little more so in right lower quadrant. Tenderness at McBurney's point, abdomen distended with gas. Temperature 101 F., pulse 90. Patient was placed on exclusive rectal alimentation for six days. His condition improved from day to day, all the serious symptoms disappearing by the end of the third day.

Operation: May 15, incision through right rectus muscle 10 cm. long. Appendix severely congested, shortly bent and constricted at its cecal end, tied down in a bed of adhesions its entire length to posterior surface of cecum. Mesenteric glands enlarged, the largest the size of a bean. Appendix removed by separating base first and then dissecting towards apex of appendix. Apex of appendix extended up behind the gall-bladder. Wound closed. Appendix contained ulcerated areas of the mucous membrane, a fibrous constriction near the cecal end, and its lumen contained pus and fecal material. Patient recovered normally, leaving hospital on May 13, 1901.

No. 9002.—Mr. Simon Q., an iron-worker, 40 years of age, came under my care April 10, 1901. He gave the following history: One brother died of carcinoma of the stomach and mother of asthma. He has twelve brothers and sisters and father, living and well. From four to six he was troubled with some infection of neck. Between 14 and 19 he was troubled with dyspepsia. Four weeks ago was taken with severe pain in region of umbilicus, vomiting and chill. Ingestion of food or water aggravated vomiting, pain became more diffuse, but patient continued to work until two weeks ago, when he became too weak to work. About this time pain became localized in right inguinal region, pain and vomiting persisted.

Present Condition: Somewhat emaciated, tongue thickly coated, dentine on every tooth exposed. Appetite poor, bowels constipated, heart and lungs normal. Abdomen considerably distended, but soft. No abdominal tenderness, temperature 99 F., pulse 62, regular and strong. No history of jaundice or vomiting before this attack. Has been constipated for years. Patient placed on exclusive alimentation for five days. Gastric lavage employed. Nausea and vomiting subsided and gaseous distention disappeared. April 14, patient's general appearance has improved greatly. Abdomen scaphoid. Tympany has subsided almost completely. Some tenderness under left costal arch, where there is a slight swelling, which moves downward on inspiration. Has had bleeding from hemorrhoids for several years. A few hemorrhoids, otherwise rectal examination negative.

Operation: April 15, incision through right rectus muscle. Appendix severely congested, as the result of acute inflammation, club-shaped and adherent; constricted at cecal end, contains gas, fecal material and mucus. Its mucous lining is obliterated. An apparent old tear in serous covering of cecum sutured. Appendix removed in usual manner. A carcinoma, size of goose egg, involving transverse colon, just to right of splenic flexure. The lymphatic glands in the mesentery are secondarily involved. Adherent small intestines loosened and tear sutured by silk Lembert sutures. An anastomosis with needle and thread made between sigmoid flexure and transverse colon 7 cm. long. Wound closed. Patient recovered normally. Left hospital May 15.

These histories comprise all of the cases of acute perforative appendicitis I have operated in the Augustana Hospital during the past four months. There is but one death among them, and that must be credited to a lack of judgment. The histories, although necessarily much abbreviated, give a clear idea of the progress of the disease in such cases whenever this form of treatment is employed. I am positive that the mortality would have been at least four times as great had all these patients been operated at once, upon admission. There are three cases which do not properly belong in this group, because perforation had not actually taken place, but I am confident that this was only prevented by the treatment. Moreover, each one of these cases had quite advanced peritonitis at the time of admission, which would undoubtedly have progressed rapidly had not peristalsis

been inhibited. In each of these cases the attack was exceedingly violent until this form of treatment was instituted, but subsided very promptly after commencement of this treatment.

CONCLUSIONS.

As a result of my clinical observations I am prepared to formulate the following conclusions:

1. Peristaltic motion of the small intestines is the chief means of carrying the infection from the perforated or gangrenous appendix to the other portions of the peritoneum, changing a circumscribed into a general peritonitis.

2. This can be prevented by prohibiting the use of every kind of food and cathartics by mouth, and by employing gastric lavage in every case in which there are remnants of food in the stomach or in the intestines above the ileo-cecal valve, as indicated by the presence of nausea or vomiting or meteorism.

3. The patient can be supported by the use of concentrated predigested food administered as enemata not oftener than once in four hours and not in larger quantities than four ounces at a time.

4. This form of treatment, when instituted early, will change the most violent and dangerous form of acute perforative or gangrenous appendicitis into a comparatively mild and harmless form.

5. Cases of perforative or gangrenous appendicitis, with beginning general peritonitis, can usually be carried through the acute attack safely with this method.

6. In all cases of this class gastric lavage should be practiced in order to prevent the absorption of decomposing material from the alimentary canal.

7. In cases of doubtful diagnosis this form of treatment should always be employed.

8. This treatment will prevent a large proportion of the most troublesome complications and sequelæ of appendicitis, such as ventral hernia, fecal fistulæ, extensive adhesions, etc.

9. The patient should be permitted to recover fully from his acute attack before an operation is performed, except in cases encountered within the first thirty-six hours after the beginning of an attack or in case of the formation of a superficial circumscribed abscess.

10. It often requires but a small amount of any kind of food to change a harmless circumscribed into a dangerous diffuse peritonitis.

11. The treatment does not protect the patient against a subsequent attack.

12. It does not contraindicate the removal of a diseased appendix before the septic material has extended beyond this organ.

13. It is indicated in all intra-abdominal conditions in which it is desirable to prevent the distribution of septic material by means of peristaltic motion.

14. The laity should be taught to stop feeding and giving cathartics to patients suffering from intra-abdominal diseases.

710 Sedgwick Street, Chicago.

Rhus Toxicodendron Poisoning.—This is the season of the year when all physicians resident in a large area of the United States are interested in a remedy of utility in case of rhus toxicodendron poisoning, when a patient presents himself with the usual symptoms of ivy or oak poisoning which are nearly all visible to the naked eye. Dr. R. S. Patterson, of Oakdale, Pa., uses glyco-phenique and aqua, equal parts; apply on lint without stint. If the case is a little chronic or two or three days old use glyco-phenique and olive oil, equal parts, locally. Neither of the above combinations of glyco-phenique will remove the stain of rhus tox. from the patient's clothing, but the tumefaction will fade out under its influence in a few hours.

SECTION ON OBSTETRICS AND DISEASES OF WOMEN.

ADDRESS OF CHAIRMAN DELIVERED AT THE FIFTY-SECOND ANNUAL MEETING OF THE A. M. A., HELD AT ST. PAUL, MINN., JUNE 4-7, 1901.

HENRY P. NEWMAN, A.M., M.D.

CHICAGO.

Members of the Section and Guests: I am deeply sensible of the honor of the responsibility you have conferred upon me in selecting me to preside over the session of a body such as this, and in thanking you most sincerely, I wish also to thank you for having selected an aid so proficient as our secretary, Dr. Bonifield. Largely to his efforts is due a program which would do credit to any association of specialists in the world of medicine, and in spite of the fact that the work of your secretary is particularly difficult. Since we have no organization as a Section, and no connected existence beyond these annual meetings, there is lacking the stimulus of historical association. Beyond the papers and other scientific contributions which are read in session and then published only in part and scatteringly in *THE JOURNAL*, the record of our proceedings is lost from year to year, and there is no continuous and organic relation such as there should be through the periods of our work. This, it seems to your chairman, is where lies greatest need for improvement, and my suggestion to this meeting would be that permanent organization be effected, that a permanent secretary be appointed who shall keep the minutes of meetings and attend to the publishing in a suitable volume of the entire proceedings, including papers.

With the growth of the Association it has become necessary, or at least expedient, to propose a reorganization of the work of the general body, thus saving to the members the valuable time now consumed in the general meeting.

The establishment of the proposed House of Delegates will give opportunity for a closer and more permanent organization of the different Sections, and will result, I am convinced, in more efficient work. As the list of papers and participants shows, this gathering of gynecologists and obstetricians has assumed proportions and an importance second to none in existence and worthy of more thorough and reliable organization than the haphazard annual method now in vogue.

SCIENTIFIC PROGRESS.

In calling your attention to the year's progress in gynecology and obstetrics, as required by the By-Laws of the Association, it is only necessary to mention briefly such events as seem to have the most direct relation to the growth and development of this branch of science, leaving it to time and your good judgment to determine their value.

ANESTHESIA BY LUMBAR PUNCTURE.

Among the most noteworthy and widely discussed of such events is the clinical adoption by some of our leading authorities of the method known as cocaineization by lumbar puncture.

Testimony as to its usefulness is of the most conflicting nature. The procedure originated with Dr. Leonard Corning, of New York, who proposed it as long ago as 1885, but did not practice it except in laboratory experiment. Bier, of Germany, made the first injection into the cephalo-rachidian liquid. Tuffier next became a supporter of the method and, after one or two former papers, has just brought out a most favorable report