

TRANSACTIONS

OF THE

PHILADELPHIA ACADEMY OF SURGERY

STATED MEETING HELD APRIL 1, 1929

The President, DR. ASTLEY P. C. ASHHURST, in the Chair
CALVIN M. SMYTH, JR., M.D., Recorder

MULTIPLE MYELOMA

DR. J. STEWART RODMAN reported the case history of a colored woman, thirty-three years of age, who was admitted November 1, 1928, into the reporter's service, at the Woman's College Hospital, with the chief complaint of pain in the hips, back and shoulders and a tumor about the size of an adult patella three inches below the left knee-joint on the anterior surface of the right tibia. Eight years before, she struck the left leg, at the site of the present tumor, against a tree. No break of the skin and no fracture resulted but the leg was painful and a small hard nodule developed about one month later. It had never been painful but has continued to grow until it became about three times its original size when she was admitted to the hospital. For the past four years she had complained of the present symptoms. Due to pain she has been unable to walk without crutches for the past three months and when she does so there is now pain in the sternum, ribs and shoulder. She has had severe pain in the left thigh for the past three weeks and has been treated for rheumatism for a year.

The physical findings of importance were the presence of the tumor of the left leg three inches below the knee-joint. This tumor was about one and a half inches in length and one inch in width; slightly movable over the bone and apparently growing in the subcutaneous tissue. It was hard in consistency. There was enlargement of the inguinal glands on both sides. On the right, small nodular bodies extend subcutaneously down the inner side of the thigh to the inner side of the knee. There is tenderness on deep palpation on the inner side of the right thigh just below inguinal region. On the left side there is extreme tenderness just below Poupart's ligament and a second area of tenderness on the outer side at a little more distal level. There is pain at the left hip-joint on passive motion. On two occasions the blood Wassermann was reported as anticomplementary. The blood count was: hæmoglobin 60 per cent.; erythrocytes 4,044,000 leucocytes 4100. Blood chemistry showed calcium, CO₂ combining power, sugar, and urea to be within normal limits.

Icterus index 3.6 van der Berg negative direct. The urine was essentially negative.

On the X-ray diagnosis of probable multiple myeloma the urine was examined for Bence-Jones albumosuria and found positive. On November 16, 1928, the tumor of the left leg was removed under gas-oxygen anaesthesia. It proved to be unattached to the bone and the pathological diagnosis was myxofibroma. The patient was discharged December 13, 1928, at her own request.

METASTASIS TO BONE FROM CARCINOMA OF BREAST

DR. J. STEWART RODMAN reported the case of a married woman, fifty-five years of age, who was admitted May 10, 1928, into the reporter's service

at the Woman's College Hospital. This patient had known of a tumor in her left breast for five years, at the beginning of which time she noticed a small red area in the outer upper quadrant. About one year ago, the mass having increased three or four times its original size, the skin broke down and it began to bleed. Still for some months she continued to treat herself until finally in April, 1928, she consulted Dr. George Pfahler. Since then she had had fourteen X-ray treatments. The bleeding stopped and the mass grew smaller in size. She was then referred to Doctor Rodman for operation.

The left breast presented an area, 5 by 2.5 centimetres, to the outer side of the nipple in the upper outer quadrant, the skin over which was ulcerated. There was a definite tumor mass beneath, which was not adherent to the chest wall. The axillary glands were palpable on the left side.

May 11, 1928, the breast was amputated with no other idea than the control of hæmorrhage and the removal of the ulceration. Pathological examination diagnosed the mass adenocarcinoma.

March 14, 1929, about ten months after her first admission to the hospital she was readmitted for the purpose of X-ray study because she complained of a lump in the right clavicle and pain in back for five weeks. Since her operation she had gained weight and her general health was greatly improved for about seven months, when she first noticed the lump above referred to in the right clavicle.

DR. JACOB VASTINE demonstrated a series of X-ray films illustrating various phases of the metastasis to bone from carcinoma of breast. The speaker also called attention to some of the results which had been obtained from the treatment of primary growths by intensive radiation. He laid particular emphasis on the fact that most cases which the röntgenologists were called upon to treat were already in an almost hopeless condition. Doctor Vastine was of the opinion that primary growths could be treated with practically the same degree of success by radiation as by surgery, if the röntgenologists had the opportunity of treating the favorable ones.

CHORDOTOMY FOR GASTRIC CRISES, COMPLICATED BY ACUTE INTESTINAL OBSTRUCTION

DR. HUBLEY R. OWEN and DR. TEMPLE FAY, by invitation, reported the following case which the reporters believe to be the first one reported in which an acute intestinal obstruction occurred in a case where section of the anterolateral columns (chordotomy) had been performed, rendering the patient anæsthetic to pain on the right half of the body below the nipple line. The signs and symptoms of intestinal obstruction in the presence of this anæsthesia were unusual. An exploratory laparotomy was possible on the right side without the need of anæsthesia, and an opportunity was afforded to observe the remaining distribution of pain fibres to the peritoneum, a fact of much importance, neurologically. The case also illustrates a new method of chordotomy whereby the selection of pain fibres within the cord itself, under local anæsthesia, is possible, so as to permit the destruction of these fibres alone, leaving other forms of sensation intact.

DOCTOR OWEN established at the time of his operation, the fact that the parietal peritoneum on the right side was insensitive to pain. This corresponded to the area of the pain loss also noted in the skin and muscle layers. Doctor Owen found that traction or manipulation of the visceral peritoneum

CHORDOTOMY FOR GASTRIC CRISES

was painful, indicating clearly that the pain fibres remained in the visceral peritoneum, and either had their origin from the left side, or entered the visceral peritoneum from a level above the sixth thoracic segment of the cord on the right.

The operation of chordotomy was suggested by Doctor Spiller in 1907, and was first carried out on the human being for him by Doctor Edward Martin, in 1911. Since that time it has been used frequently in this country and abroad as a means for relief of pain. The development of a safe and accurate technic for this procedure is due to Doctor Frazier, who reported a series of these cases with Doctor Spiller, in 1920. The method used by Doctor Frazier was the introduction of a small curved hook, designed by him to include only the anterolateral columns of the spinal cord. This method has given extremely satisfactory results. Doctor Spiller has suggested a further refinement in technic, when indicating the possibility of separating the pain and temperature fibres within this anterolateral column, by the introduction of a small knife to the desired depth, while the patient is under local anæsthesia, and the neurologist is present to determine the exact level of anæsthesia for pain or temperature required in the operative procedure.

It has been possible in two cases so far, to dissociate the pain and temperature fibres and to establish exactly the level of anæsthesia desired. The following case illustrates this method of chordotomy and the location of the fibres supplying the lower extremities and the trunk. A further addition to the understanding of pain distribution to the visceral peritoneum is due to the subsequent observations of Doctor Owen at the time of his operation for intestinal obstruction.

The patient was studied in the neurological service of Dr. Edward Strecker, at the Jefferson Hospital, where a diagnosis of tabes associated with gastric crisis was made. Later she was transferred to the Philadelphia General Hospital for continued treatment and observation, where she was under the charge of Dr. George Wilson who recommended section of the anterolateral columns for relief of the severe pains, associated with her crises. A bilateral chordotomy was performed at the fifth thoracic segment of the cord following which she was pain free for one month, until the sudden onset of the intestinal obstruction.

Present Illness.—Two years before admission the patient began to complain of shooting pains in the sides and epigastrium which were bilateral, extending around to the back. Nausea and vomiting usually followed these attacks of pain. The pain always radiated around the body. There was belching of gas, abdominal distention, precordial distress, rapid respirations with marked palpitation. She complained of this pain for several months before she went to see a physician, who advised an operation after examining her. She was operated at the Lankenau Hospital one year ago, for gall-bladder disease and made an uneventful recovery, but had recurrence of her former abdominal pains about three months after the operation. The attacks of pain have become more frequent recently, nausea and vomiting accompanying the attack. There was loss of appetite following these attacks; food did not bring on an attack, but often made the pain worse during the period of her pain. She had lost twenty pounds which she ascribed to her inability to assimilate

food. Her menses aggravated the attacks. There was no reference of pain to the arms or groin at this time. The pains of which she complained are similar to those which began five years ago, and were called rheumatic pains. The attacks of pain have increased to such a degree that she spends most of her time in bed.

She was a fairly well-nourished, white female, who evidently was in severe distress and pain, as evidenced by her position and facies.

Neurological examination showed marked diminution of the deep tendon reflexes throughout, with Argyll-Robertson pupils and ataxia.

Gastro-intestinal X-ray.—Ileitis and cæcitis of infectious origin. No X-ray evidence of intra-abdominal malignancy. Intra-abdominal adhesions, post-operative.

The patient was diagnosed as having tabes with gastric crises. In consultation with Doctor Gilpin it was decided to place her on treatment of spinal drainage and mercury by inunction. She had three drainages and made excellent progress, having had two attacks of epigastric pain up to November 18, 1928. On that date, she complained of pain in the same place. No therapy seemed to be of benefit. November 20, she became confused and very delirious, shouting and talking about committing suicide. Although she was confined to a quiet room, she disturbed the entire ward. It was decided therefore to transfer her to the Philadelphia General Hospital which was done December 3, 1928.

Wassermann studies at the Philadelphia General Hospital showed a four plus spinal Wassermann. Several blood Wassermans were negative. The patient was studied in the service of Dr. George Wilson who concurred in the diagnosis of tabes with gastric crises, and because of the patient's severe and prolonged attacks of pain, advised section of the anterolateral columns on each side of the spinal cord as a means of relief of pain. She was transferred to the service of Dr. Temple Fay, on January 21, 1929, and a bilateral chordotomy performed under local anaesthesia.

The anterolateral columns were incised on the left side by means of a cataract knife. The resultant sensory pain and temperature loss was demonstrated after each incision by careful neurological tests made by Doctors Spiller and Wilson, until the level for pain loss was demonstrated as high as the fourth thoracic segment on the right.

Following the left-sided chordotomy there was some loss of motor power in the left leg. The dentate ligament on the right was then incised, the cord rotated and chordotomy performed. Anaesthesia was not demonstrated as high on this side, but only to the region of the hip. On the right side of the body, anaesthesia was demonstrated approximately to the third dorsal segment.

The patient had an uneventful post-operative convalescence excepting for some lighting up of an old cystitis. She rapidly regained the power in her left lower extremity and anaesthesia was demonstrated for pain on the right side as high as the fifth thoracic segment; a diminution for temperature sense was present though this was not lost. On the left side, the loss of pain extended as high as the second lumbar segment, with marked impairment of pain as high as the ninth thoracic segment. Temperature sense was also impaired, but not lost in this area. (Fig. 1.)

The case demonstrated that the pain fibres for the sacral region and lower extremities are situated on the periphery of the spinal cord. Doctor Spiller's sensory examination disclosed that the area of anaesthesia rose on the body as the knife was introduced successively deeper into the cord in the region of the anterolateral columns. The definite loss of pain without a similar degree of temperature loss indicates that these fibres are represented by separate pathways within the spinal cord, and that with great care, under local anes-

CHORDOTOMY FOR GASTRIC CRISES

thesia, it might be possible to select the exact fibres desired and regulate the height of anæsthesia for pain required, in this operation. The former method was one in which under general anæsthesia the entire anterolateral column was enclosed within a hook and sectioned *en block*. The patient was pain free and had made a most satisfactory recovery until February 18, 1929, approximately one month after her chordotomy, when she was awakened by severe pain in the right pectoral region, which radiated down to the right elbow. The patient then vomited. Immediately following this she began to have abdominal pain located over the left side of the abdomen. She became dyspnoëic at the same time. Her abdominal pain gradually became intensified until it was excruciating in type and the patient cried out due to its severity. Lips and fingers were cyanotic. Pulse was almost imperceptible.

Lottie G.

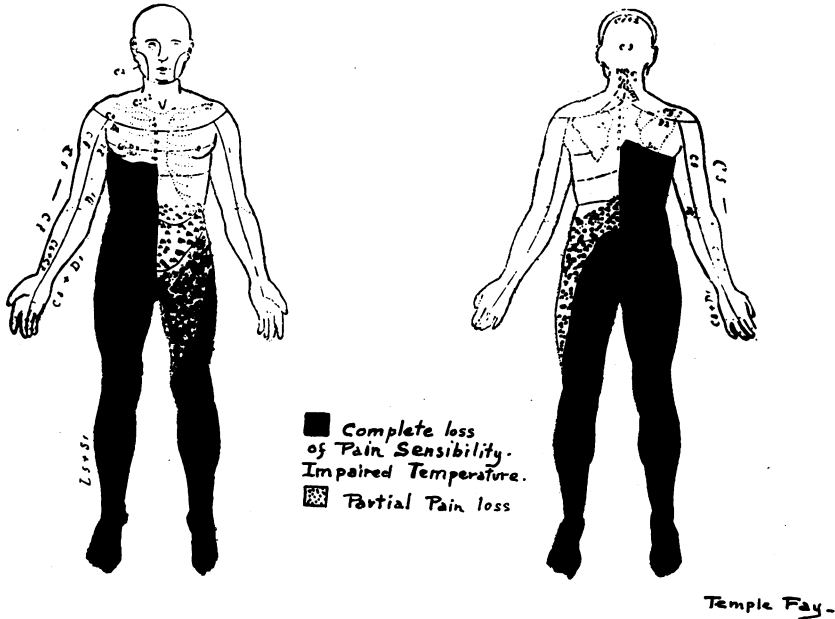


FIG. 1

Blood pressure 80/70 in each arm. Temperature 98°, pulse 110. Soft second sound almost inaudible. Urine contained myriads of leucocytes. Because of the sudden onset, low blood pressure, cyanosis, abdominal and brachial pain, coronary thrombosis or angina pectoris was considered. The plus four Wassermann made the impression of coronary sclerosis more probable. Doctor McMillan secured an electrocardiogram and ruled out an acute cardiac lesion. An abdominal complication was then suspected and Doctor Owen was called in consultation. The lack of rigidity of the abdomen, the presence of a tender mass in the upper abdominal area, with extreme pain; temperature 101, pulse 150, respirations 48; with incessant vomiting, not faecal in character, presented a problem for diagnosis. The abdomen was not distended, but on viewing the patient's abdomen from the foot of the bed, it could be seen that on the right side in the middle of the abdomen, there was a globular swelling. Palpation elicited some pain and tenderness, but neither the pain nor tenderness was acute in character. The mass was doughy in consistency, there was no rigidity or distention of the abdomen. The rectal examination was negative.

The diagnosis of intestinal obstruction was made and the patient was operated upon immediately by Doctor Owen. Incision was made to the right of the mid-line without the need of an anæsthetic. On opening the peritoneum, considerable blood-stained fluid was found in the free peritoneal cavity and immediately there presented itself a large obstructed coil of intestines. This large loop of small intestine, estimated between eight and ten feet, was found tightly bound by a band of adhesions around the mesentery, and the whole loop of gut was twisted on itself by torsion. The torsion was corrected and the thick band of adhesions was cut between two ligatures. The constricted area was well back in the mesentery, but the wall of the bowel was glistening and was brownish in color. No area of actual gangrene nor necrosis was found. Hot towels were applied and the color of the intestines was partially restored. The area of involved intestines was too great and the patient's condition too grave to warrant any thought of resection. The gut was returned to the abdomen, and the abdomen closed by through-and-through sutures, with one suprapubic drain to the pelvis. The operation was performed without any anæsthetic, with the exception of during the manipulation of the intestines, when a small amount of nitrous oxide and oxygen was administered. She was returned to the ward in grave condition, and died the same night.

The reporter remarked that the interesting factors in this case include a method for determining the level of pain loss in cases where chordotomy is indicated, and this method can be accurately determined by examining the patient during the cutting of the anterolateral columns, under local anæsthesia. The sensory supply for pain to the peritoneum is another most interesting point in this case. It was not only possible to make an exploratory incision on the right side of the abdomen in this field of anæsthesia, without the patient's knowledge, but Doctor Owen noted the absence of any pain while manipulating or opening the parietal peritoneum. The visceral peritoneum, however, was painful, and required a slight gas anæsthesia in order to attempt surgical relief of the torsion and obstruction. This is evidence that pain fibres are supplied to the visceral peritoneum, either bilaterally from the side which still had pain sensation in the upper thoracic segments, or, that these pain fibres reach the cord at a level higher than the third thoracic segments; and hence that the pain experienced by the patient was carried by fibres which reached the cord; either on the left side or above the third thoracic segments.

Another interesting phase of this case was the masking of symptoms due to the chordotomy, and probably somewhat due to the presence of tabes. The absence of rigidity implies some factor associated with pain that was disturbed, or must be considered from the standpoint of her tabes. It is difficult to estimate whether the constriction of the mesentery by the band of adhesions first aggravated her abdominal pain; but in as much as her pains preceded her formal abdominal operation, and were not relieved by it, the possible source of adhesions following the former abdominal exploration does not lend sufficient weight to the consideration of intermittent obstruction as responsible for her pain. A clear-cut case of tabes makes the condition probably one of typical gastric crises; the sudden intestinal obstruction being an unusual complication.

DR. FRANCIS C. GRANT said that the indications for chordotomy in gastric crises are clean-cut paroxysmal pain of such severity and frequency that

CHORDOTOMY FOR GASTRIC CRISES

the sufferer is economically incapacitated. The term "economically" is used advisedly because infrequent attacks of abdominal pain are not sufficient indication for an operation such as chordotomy. In properly selected cases the results are quite satisfactory. In the past few years, he has performed six chordotomies for gastric crises. Three patients are alive, self-supporting and pain free. One death from luetic myocarditis occurred six weeks following operation as a direct result of the procedure. In this case vesical incontinence was noted. But in none of these patients was pyramidal tract involvement with impairment of motor function observed.

Doctor Fay has made an important observation in confirming Foerster's claims that the fibres for pain and temperature decussate promptly on entering the cord. It was hitherto supposed that these fibres travelled up the cord for several segments before crossing to the opposite side. Knowledge of this fact is of value for it indicates that chordotomy may be done at a lower level than hitherto supposed, provided that the section in the anterolateral columns completely severs all the fibres. It also obviates the necessity of sectioning posterior roots above and below the incision into the cord. The speaker has felt this latter precaution to be particularly indicated in relieving pain from gastric crises, since cord section at the fourth thoracic segment, the point of election, is not more than three or four segments above the region where pain fibres from the abdominal viscera presumably enter the cord. Doctor Grant believes that chordotomy under local anæsthesia is a little hard on the patient. To be sure he has only seen one case performed in this way. Although it was carried through by a surgeon skilled in the procedure and while every effort was made to prevent unnecessary distress, manipulation of the posterior roots caused considerable pain. In *tabes dorsalis* these roots are bound down by adhesions as is the cord itself, and considerable handling is necessary to free them so that the cord can be turned to perform properly the section of the anterolateral tracts. Curiously enough section of the cord itself is not painful.

The most interesting part of Doctor Fay's observations has to do with differentiation of the tracts for pain and temperature. As he states, it has been long suspected that the fibres subserving these sensations ran in separate areas. That he was able by careful sectioning to produce thermæsthesia without loss of pain sense confirms these opinions held heretofore on largely theoretical grounds. From the physiological and neuro-anatomical points of view this observation may justify the use of local anæsthesia. From the technical standpoint the speaker did not see how the method of section of the tracts described by Doctor Fay is an improvement on the method described by Frazier. In the case here reported, even with the use of local anæsthesia, motor weakness resulted, nor was the sensory level any higher than that obtained when a chordotomy hook is properly inserted into the cord and the section made.

While this report has added distinctly to our knowledge of the course of the pain and temperature fibres within the cord, Doctor Grant is sure that most surgeons will feel that our present methods of local anæsthesia are

inadequate sufficiently to control pain produced by the manipulations necessary to free delicate structures like the posterior roots from the adhesions which surround them in tabes. Since the carefully standardized technic described by Frazier can be used so successfully with general anæsthesia, whereby unnecessary pain to the patient is avoided, it seems unwise to abandon it even if thereby obscure anatomical problems may be solved.

DR. TEMPLE FAY remarked that in most chordotomies, including several cases which he recalled on the Frazier service, and in his own experience, one does get a traumatic myelitis associated with motor weakness, following operation, which may last for one week or ten days. It is due to trauma of the cord at the time of the chordotomy and does not necessarily indicate the section of the pyramidal fibres. The return of motor function is evidence that it must be due to trauma, and not to section, as no return of function ever occurs after destruction of the fibres within the spinal cord.

As to the type of anæsthetic, there is no doubt the patient is less comfortable under local, and yet with it one knows exactly what he is doing and the neurologist is able to tell the operator when he has cut the desired number of fibres, which he wishes to select. In the other cases also described, Doctor Wilson and the speaker were able not only to do a chordotomy, but to take away only the supply of pain from the right hip and leg. They did not want to destroy pain any higher than the hip and therefore preferred this method. Whether there is a greater hazard of destroying more than one wants to under general anæsthesia, it is difficult to say. Doctor Spiller has added a further refinement of his operation, which, with improvement in our technic of local anæsthesia, will be even more acceptable.

GASTRIC CRISIS COMPLICATING CANCER OF PYLORUS

DR. HUBLEY R. OWEN reported the case of a man, fifty years of age, who was admitted to the Woman's College Hospital October 22, 1925, with the chief complaint of rapid loss of twenty-five pounds in weight, general malaise, weakness and abdominal pain.

For about six months prior to his admission to the hospital this man had been having pain in the upper abdomen. The pain was severe in character; it had no relation to the taking of food. There was a sense of constriction around the upper abdomen. The pain was not referred and was unassociated with nausea and vomiting until recently. During the three weeks prior to admission to the hospital, he had lost twenty-five pounds in weight. His pain, which was occasional at first, during the past three or four weeks, has been constant and he has been nauseated and has vomited at frequent intervals. At no time has the vomitus contained blood.

When admitted the abdomen was fairly well nourished but the appearance of the tissues indicated loss of weight. No tumor nor masses could be felt. Patient complained of subacute tenderness on deep palpation of the epigastrium. No tenderness in the region of the gall-bladder nor appendix. Rectal examination revealed no abnormality. The patient had Argyll-Robertson pupils; a fine tremor of his hands; slight exophthalmos; complete loss of knee-jerks. Romberg's sign present. Hæmoglobin 65 per cent., red blood cells 3,250,000, white blood cells 9600. Examination of gastric contents showed no free hydrochloric acid; presence of lactic acid. *Blood chem-*

POST-OPERATIVE MASSIVE ATELECTASIS

istry: Blood sugar 110, blood urea 18. Urine normal other than a trace of albumen. Wassermann was plus four in both antigens.

During the patient's stay in the hospital he had frequent attacks of severe girdle pain sometimes accompanied by vomiting. He frequently had the pain without either nausea or vomiting. *X-ray examination* was as follows: "There is a marked irregularity in contour about the pylorus with retention of the barium meal over seventy-two hours. No complaint of pain on manipulation of the stomach. Second examination of the stomach showed the same deformity and retention. The colon was negative."

The man was put on antiluetic treatment but continued to lose weight. He was operated upon October 30, 1925. A firm mass at the pyloric end of his stomach was disclosed; the stomach was dilated and thickened; the pylorus was greatly constricted and would not admit the end of the index finger; the mass was freely movable. No glands could be felt. As the mass was practically free of adhesions and as there was no evidence of metastasis, pylorotomy was performed. About one-third of the pyloric end of the stomach was removed. Following the operation the patient made a smooth recovery. He was discharged from the hospital November 16, 1925, and referred to the neurological service of the Medical Division, Department of Public Safety. At that time he was complaining of severe neuritis over the nerve trunks of the lower extremities. He reported for duty February 22, 1926, four months after his admission to the hospital. Shortly after this date, in spite of antiluetic treatment, his eyesight began to fail and the neuritis continued. He was admitted to the Philadelphia General Hospital February 19, 1927. It was found that he had advanced mitral and aortic lesions of his heart and a mass in the epigastrium. He had incessant vomiting, rapid emaciation and died in the Radiological Ward March 12, 1927.

The case is reported in conjunction with the previous case because of the confusing symptoms of girdle pains associated with a luetic lesion. The symptoms were typical of tertiary syphilis. An operation was agreed upon before a prolonged course of antiluetic treatment could be tried because of the X-ray findings and the result of the gastric analysis. Neither ulcer nor malignant growth was at first suspected.

The pathological report on the specimen removed was adenocarcinoma of the stomach.

POST-OPERATIVE MASSIVE ATELECTASIS: BRONCHOSCOPIC ASPIRATION

DR. CALVIN M. SMYTH, JR., reported the case of a young woman, nineteen years of age, a student nurse, who was taken ill May 13, 1928. She was admitted to the nurse's infirmary on that day with the diagnosis of acute appendicitis. She had had occasional attacks of pain in the right iliac fossa during the past year. Aside from this, and two attacks of tonsillitis, her health had always been excellent. Appendicectomy was performed on the afternoon of the day of admission, ten hours after the onset of the attack. The operation was done under nitrous oxide and oxygen anæsthesia, no ether being employed. The appendix which was acutely inflamed and on the verge of perforation was easily and quickly removed through a small McBurney incision and the abdomen closed without drainage. During the operation the patient did not cough, strain, vomit or become cyanosed. There was no vomiting during the period of reaction from anæsthesia.

On the following day a slight cough developed and a few squeaky râles could be heard at the left apex. Forty-eight hours after operation the axillary temperature rose to 103.6° , and the pulse to 170. She became delirious. Examination of the chest at this time showed the apex beat to be displaced

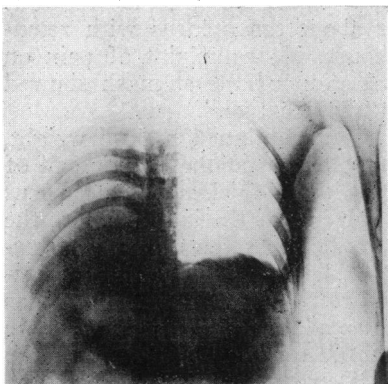


FIG. 2.—Appearance of chest immediately before bronchoscopic aspiration.

to the left anterior axillary line. The entire left chest was flat to percussion and the breath sounds were almost inaudible except at the apex. The patient was quite cyanotic, appeared to have great difficulty in breathing and complained of a tugging or dragging in the left chest. Early the following morning she had a severe attack of dyspnoea which was relieved when she coughed up a small mucous plug. The diagnosis of massive atelectasis having been confirmed by X-ray examination (Fig. 2), she was placed on the sound side and encouraged to cough. The condition failed to materially improve and the patient's general condition became weaker. On May 18, five days following the operation and three days after the development

of the atelectasis, X-ray failed to show any improvement and she was seen in consultation by Dr. Gabriel Tucker, who advised immediate bronchoscopic aspiration.

The bronchoscope was introduced through a laryngoscope; the right main bronchus was clear but the left was tightly plugged. Aspiration removed about five cubic centimetres of thick, tenacious material which later was found to contain the pneumococcus in pure culture. The reaction of the patient to this procedure was immediate and spectacular. The left chest which had been completely immobile expanded and the tugging sensation, of which she had previously complained, disappeared. X-ray examination made within fifteen minutes after the bronchoscopy showed the lung filled with air. (Fig. 3.) The patient passed a comfortable night and on the following morning coughed up several plugs similar to the one aspirated. The physical signs in the lung and the position of the apex beat rapidly returned to normal. There was no elevation of temperature after the aspiration and convalescence from the appendectomy progressed uneventfully to recovery. The patient was discharged May 29, nineteen days after the original operation and twelve days after the bronchoscopic aspiration.

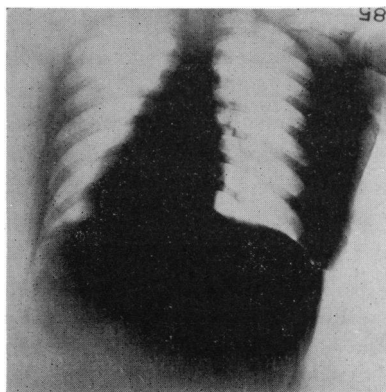


FIG. 3.—Appearance of chest fifteen minutes after aspiration.

The thing which impressed everyone who saw this patient was the complete absence of pain or shock occasioned by the bronchoscopy. The patient herself said immediately following the procedure that, while of course it was uncomfortable, the relief was so great that she would not hesitate to have it done again. Doctor Smyth remarked that he was reporting this case not on

POST-OPERATIVE MASSIVE ATELECTASIS

account of anything unusual in the condition, but to again call attention to the fact that massive atelectasis could be relieved immediately and with complete safety by bronchoscopic aspiration. Treated by expectant and more conservative measures it usually required about three weeks for the lung to be restored to its normal condition.

DR. CHARLES F. NASSAU said that he wondered if these conditions of collapse of the lung are ascribed to the anæsthesia. He had a patient seven weeks ago who was operated upon under spinal anæsthesia, and who developed massive collapse of the lung the day following operation. He went down as fast as though struck with an axe. Doctors Clerf and Tucker were not available so he had to turn the patient on his good side and trust to luck. The following evening, after thirty-six hours, he was so much better without bronchoscopy that Doctor Clerf said to let him alone. He made a good recovery.

Regarding local anæsthesia, the speaker remarked that he had been doing a great part of his work with this form of anæsthesia for twenty-five years and had never seen massive collapse of the lung following it.

DR. WALTER E. LEE said that it is generally admitted statistically that the incidence of post-operative pulmonary complications is as great, if not greater, following local anæsthesia as occurs after general anæsthesia.

The first bronchoscopic drainage of a case of post-operative massive collapse was done by Doctor Tucker at the Germantown Hospital in 1923. Since that time nineteen cases has been drained bronchoscopically by Doctors Tucker and Clerf of the Chevalier Jackson Clinic. We must admit that we are peculiarly favored in Philadelphia in having available trained bronchoscopists to treat these emergencies, and the immediate relief that has been obtained in every one of these cases has more than justified the treatment. In only one of them was it necessary to repeat the drainage. In the hands of a skilled bronchoscopist we can testify that it is not as formidable a procedure as one would imagine. It is usually completed in three to five minutes and the immediate relief experienced by the patient has convinced them of its value and all of them have said that they would willingly have it repeated, if necessary. In a recent case by Doctor Clerf, when threatened with a second bronchoscopic drainage, because the patient refused to cough up the obstructing bronchial secretions he said: "Bring on the bronchoscope, I would far rather have that than the pain of coughing."

It must be remembered that the purpose of the bronchoscopic drainage is not to completely remove the masses of bronchial secretions, but to relieve the point or points of bronchial obstruction and establish an airway beyond these obstructions, and thus restore the cough reflex and stimulate the patient to expel these masses of secretion. That the obstruction is due to the sticking of the tenacious material to the walls of the bronchi has been demonstrated time and time again at the time of the bronchoscopic examination. Undoubtedly, in the large majority of cases, this obstruction is overcome by the patients themselves and they will give you the history of coughing up

large quantities of sputum following some change of position, or some sudden excitement, and after the expulsion of the secretion their subjective symptoms will be immediately relieved. Doctor Santee has actually observed this relief of obstruction under the fluoroscope when he was examining a patient, and his suggestion that we turn the patient on the opposite side is at times all that is necessary.

Doctor Scott, of Rochester, has suggested a very valuable procedure in the use of inhalations of carbon dioxide to increase the depth of inspiration, thus restoring the cough reflex and promoting the expulsion of the tenacious secretion. If one understands the mechanism of post-operative collapse and appreciates that the therapeutic indications are the relief of bronchial obstruction and the establishment of an airway so that the cough reflex will be restored, he can intelligently employ these measures. In the early stages, deep breathing or a change of posture may be all that is necessary. In the same period or a little later, the deep inhalations of carbon dioxide, may suffice but after a lapse of several days, because of the gradual increasing viscosity that follows the loss of the fluid content of the secretion, bronchoscopic drainage should be considered. In the later stages, the simpler procedures are rarely successful, while bronchoscopic drainage gives immediate and positive relief.

Present experience shows that bronchoscopic drainage is not a formidable procedure, and after simpler measures fail, the patient should always be given the benefit of such a procedure.

BULLET WOUND OF INTESTINES AND KIDNEY WITH NEPHRECTOMY

DR. BENJAMIN LIPSHUTZ presented a man, thirty-eight years of age, who was admitted to the Mt. Sinai Hospital January 19, 1929. Twenty minutes before admission to the hospital while bending over, a revolver dropped from his pocket and discharged, the bullet entering a little below and to the left of the umbilicus. He immediately complained of violent abdominal pain and began to feel faint; the speaker saw him one hour later; he was in shock. The pulse was feeble, rate about 90, blood pressure 70; examination of the abdomen showed diffuse tenderness and rigidity, and palpation over the back showed the bullet below between the eleventh and twelfth ribs. Immediate operation was carried out under local anaesthesia, supplemented with nitrous oxide and oxygen. An upper left rectus incision was made; on opening the abdomen free blood clots and intestinal contents were disclosed. Examination of the spleen, pancreas and liver disclosed no injury. The intestine, namely, the upper ileum and jejunum as far as the duodenal-jejunal junction disclosed fifteen perforations; these were closed with interrupted Lembert sutures, care being taken to avoid any occlusion of the lumen. Bleeding still continued, and examination of the root of the mesentery showed a point of rupture which was oozing blood; the bleeding points were ligated and the rent in the mesentery closed with ligatures. The root of the mesentery of the jejunum also disclosed a site of oozing and an increasing hematoma; the latter was opened and found to contain blood clot. Bleeding points were ligated and the mesenteric wound closed. Bleeding still persisted from the posterior part of the abdominal cavity and the presence of a large dark red swelling over the region of the kidney indicated evident accompanying injury to the kidney or one of the so-called massive hæmorrhages of the renal bed. The parietal peritoneum was separated from the abdominal

OPERATIONS ON GALL-BLADDER AND DUCTS

wall laterally and posteriorly in order to gain access to the kidney through the abdominal incision. Here it was found that bleeding was violent and active. The renal artery was not ruptured but the vein was injured and the kidney was torn to a pulp. A rapid nephrectomy was performed. The abdominal wound was closed and a stab wound made posteriorly through which a gauze pack was introduced. Convalescence was smooth except for the first forty-eight hours when liquids were limited and marked slowing of absorption was noted. The wound healed by first intention with the exception of stitch infection at the upper angle of the incision. He recovered satisfactorily and is now returned to work.

This case is an excellent example of the value of intraperitoneal exposure of the kidney in an acute injury involving the abdomen and kidney. It permits the surgeon with relatively little loss of time and no danger from increased shock, to handle both the abdominal injury and the renal injury.

In going over the statistics of associated abdominal and renal injuries, those available are largely concerned with cases the result of war injuries and it seems hardly fair to compare them with civil injuries. The prognosis is almost hopeless. In the British war statistics of 2121 cases of abdominal wounds, 155 were associated with a kidney injury. In Læwen's statistics of 159 cases, twenty-nine had accompanying renal injury, and he stated that from his personal experience of thirty-four cases of combined renal and intestinal injury, but three recovered and he thinks the prognosis almost hopeless. In the German literature, Most reported seven cases and all died. In the review of the American experience as to whether to explore the kidney first and then the abdomen or *vice versa*, the opinion was for the former because of the danger of carrying infection from the intestinal contents into the retroperitoneal tissue. But with the technic followed here, the danger of contamination is little.

Doctor Lipshutz has had three cases of this type of injury; in two other instances the kidney was not injured but there was the so-called massive hæmorrhage of the renal bed with a large hematoma, and the same method of approach was used. Exposure is rapid and the presence of the hematoma aids the surgeon to rapidly detach and separate the peritoneum.

DR. CHARLES F. NASSAU said that the most important thing in this case was the recognition of the damage to the kidney or renal vessels. Whenever one opens the abdomen for gunshot wound and finds considerable hæmorrhage back of the peritoneum, it should be determined by one method or another (stripping the peritoneum or drawing back to expose the kidney) how much hæmorrhage there is and its origin. Otherwise one may do a wonderful operation on the intestinal perforation and still lose the patient from a kidney injury.

REVIEW OF THE OPERATIONS DONE ON THE GALL-BLADDER AND DUCTS

DR. JOHN H. GIBBON read a paper with the above title for which see page 367.

DR. JOHN H. JOPSON remarked as to the choice of operation, that he had a well-defined practice of his own, which he has modified in recent years fol-

lowing disasters in older people; he agreed with Doctor Gibbon that 70 per cent. of diseased gall-bladders can be removed with benefit to the patient. In patients over sixty, however, where there is some question as to the condition of the myocardium and where the operation of cholecystectomy seems to have a reflex action on the circulation, post-operative death has occurred, due to a failing myocardium; and so he has come to look with a doubtful eye upon cholecystectomy as a routine procedure in these older patients. Of course, after cholecystectomy he has had recurrences and in one case he removed the gall-bladder ten years afterward.

Following cholecystostomy in younger patients, he believed about 50 per cent. would have recurrence; but in patients sixty or over, unless there is some organic change in the gall-bladder which clearly calls for its removal, he is satisfied with cholecystostomy. In certain other cases of gangrene or virulent infection of the gall-bladder, the less done the better (just as in other parts of the body), and it has always seemed that quick drainage and quick retreat were in order. In the cases between these two groups, with the thick and cedematous gall-bladder which will probably never return to a normal and healthy condition, the speaker had in several instances practiced with satisfaction the subtotal operation, resecting the gall-bladder and leaving about one-fifth of it into which a tube for the drainage of bile is sewn. As to the recurrence of symptoms after operation for obstruction of the duct, whether this is due to operative injury or to stenosis following ulceration of the duct from pressure of calculi, he noted that Doctor Gibbon believes it may be due to ascending infection from the gastro-intestinal tract. One knows that the further down the anastomosis is made, the more frequent subsequent infection usually is. There is probably no difference in this respect between stomach and duodenum, and the most successful result the speaker has seen followed the implantation by him of the injured duct into the stomach. The results have been excellent and the danger of injury to the ducts is minimized.

DR. GEORGE P. MULLER said that he performed cholecystostomy in most cases of empyema, because he feels that when one has ripped the gall-bladder from the liver and opened up the connective tissue spaces to find the cystic duct, one has opened up avenues for infection, because all the lymph from an infected gall-bladder must be infected, and it adds to the spread of infection. Some time ago he performed cholecystectomy in most cases of empyema, but last year reversed the procedure and performed cholecystostomy. The mortality was lower. On the other hand, dilatation of the common bile duct following cholecystectomy does not occur unless a normal gall-bladder has been removed. Doctor Gibbon thinks that a compensatory dilatation has already occurred and that the patient has had time to become used to such a phenomenon. This may be so, but when definite pathology is present in the gall-bladder with the jeopardy of life from acute infection, the speaker cannot see the wisdom of doing anything but cholecystectomy, except in old

people, because in them the period of time in which gall-stones may recur is limited and the number of times must necessarily be small.

DR. J. STEWART RODMAN said that while he had never seen an attempt of the gall-bladder to reform from the stump of the cystic duct, he would ask Doctor Gibbon if he has done so. He recalled that Doctor Sweet reported some experimental work a few years ago to this Academy showing that such might happen.

DR. CALVIN M. SMYTH, JR., said that the work of Sweet, referred to by Doctor Rodman, had been done by Doctors Hartman, Wood and himself in Sweet's laboratory in 1916 and had been published in the ANNALS OF SURGERY in a paper entitled "The Results of High Ligation of the Cystic Duct in Cholecystectomy." Two cases of reformation of the gall-bladder were reported; in one of the cases reformation of stones had occurred. Attention was also called at that time to the generalized dilatation of the common bile duct and all of the branches of the hepatic duct which occurred following cholecystectomy.

DR. ASTLEY P. C. ASHHURST remarked that he was what might be called a "cholecystectomist." He recalled receiving, a few years ago, a questionnaire asking how many cholecystostomies he had done in the previous two years. On looking up his records to reply, he found he had not done any in that length of time. Since then, he has done four cholecystostomies. The speaker looks upon the diseased gall-bladder as a menace and thinks it deserves to be removed, especially if it has stones in it.

Doctor Gibbon had left several impressions on his mind: *First* that he thinks the recurrence of symptoms after a cholecystostomy may be due to the escape of stones from the common duct (where they were overlooked) into the gall-bladder. Doctor Ashhurst does not believe this can occur, and probably misunderstood him. *Second*, that he thinks the existence of a dilated common duct means obstruction to the duct and that it should, therefore, be explored. In cases of functionless gall-bladder, the common duct is already dilated and as the dilatation means that the gall-bladder is of no use, the gall-bladder should be removed. The speaker is not in the habit of opening the common duct unless there is evidence at the time of operation that it has been or is still diseased.

DR. JOHN H. GIBBON said that Doctor Jopson's statement that the higher the anastomosis with the gastro-intestinal tract, the less likelihood of infection is interesting. Most of the speaker's cases have been with the duodenum. In the experimental work with dogs, the anastomosis was to the stomach and yet they all developed this type of infection.

The object of his paper was to encourage the exercise of judgment, of brains, and of thought in the performance of an operation and its selection and not to go at it mechanically. Doctor Gibbon did not wish to leave the impression that in common-duct disease due to non-function of the gall-bladder, the duct should be opened; what he wanted to make clear was that

when stones are found in the gall-bladder and the common duct is dilated, one ought not to be content with palpation, because one cannot always feel stones in the presence of dilatation, and it is wiser to operate in such cases. His point was for the removal of any stone rather than with the idea of opening the dilated duct. Also, he said that he did not know that this dilatation of the duct is harmful. Judd at an American Surgical Association meeting showed a case of dilatation of the entire biliary tract after removal of the gall-bladder, so that it would seem that dilatation does take place where the gall-bladder is out of commission due to disease. Removal or obliteration of the gall-bladder causes a compensatory dilatation of the duct. Division should be done down close to the common duct; a number of operators think the only thing necessary is to take the gall-bladder out and they often overlook this important point and do a great deal of harm. It must be taken out close to the common duct, regardless of the situation.

STATED MEETING HELD MAY 7, 1929

The President, DR. ASTLEY P. C. ASHHURST, in the Chair,
CALVIN M. SMYTH, JR., M.D., Recorder

COLORED MOTION PICTURES OF SURGICAL OPERATIONS

DR. WALTER E. LEE demonstrated a film of motion pictures of operations, made in colors. These pictures represented the first attempt to make colored reproductions with the artificial light of the operating room. A great handicap has been that in looking at a black and white picture, one keeps trying to interpret the film in colors and this makes it an effort to follow the technic. The speaker did not consider the demonstration perfect but presented the film because it seemed to be the first evidence of success in attempts to employ this method of teaching surgical technic.

TENDON TRANSPLANTATION FOR WRIST DROP

DR. DE FOREST P. WILLARD presented a man who was injured September 27, 1926, when he received ten fractures of the right upper extremity and an injury to the musculo-spiral nerve. At least three of the fractures were compound. He was treated at St. Luke's Hospital, Bethlehem. Open reduction of the fractures of the radius, ulna and humerus were done. All the fractures healed without infection. In April, 1927, a bone-grafting operation was performed for an ununited fracture of the middle of the humerus. In May, 1928, the musculo-spiral nerve was operated on for persistent wrist drop. The nerve was found to be a mass of fibrous tissue, and union of the nerve tissue was found to be impossible. During the past winter he was examined by neurologists in New York and Philadelphia, and further nerve operations were considered useless. Tendon transplantation was suggested. After full discussions of his needs, it was decided that individual extension of his fingers was not necessary, but that strong extension of the fingers to the 180° position and sufficient extension of the thumb extensor and one to the common extensor. This procedure usually functions well for a short period of time, but the weak flexor often proves inadequate for the necessary work and the tendon stretches and the finger flexion recurs. In this patient scars of the operative incisions on the bones of the forearm