

TRANSACTIONS
OF THE
PHILADELPHIA ACADEMY OF SURGERY

Stated Meeting Held March 5, 1923

The President, DR. JOHN H. JOYSON, in the Chair

ACUTE INTESTINAL OBSTRUCTION DUE TO IMPACTED
ASCARIDES LUMBRICOIDES

DR. JAMES A. KELLY presented a girl ten years of age, who was admitted to St. Mary's Hospital, November 6, 1922, with primary diagnosis of appendicitis (acute) and diffuse peritonitis. On admission temperature was 100, pulse 120, and respirations 136. She had been indisposed for about two weeks, complaining of nausea, anorexia and constipation. These symptoms increased, until the day before admission, when the patient was unable to have a bowel movement, became very restless and abdomen became rigid, tender and distended. Physical examination on admission showed a moderate degree of abdominal distention with generalized tenderness, particularly marked over right lower quadrant of abdomen. Patient vomited after admission, vomitus consisting of dirty, grayish-black material, and fetid, which was not fecal in character. Under ether anæsthesia examination of abdomen showed considerable relaxation and the presence of several masses, suggesting a diagnosis of acute intestinal obstruction, acute appendicitis or tuberculous peritonitis. Examination of urine negative. Blood examination showed red blood cells 4,100,000, white blood cells 11,400 and hæmoglobin 90 per cent. Differential blood count polymorphonuclear leucocytes 80 per cent., large and small lymphocytes 20 per cent. No eosinophiles.

Operation.—Through a four-inch median line incision below umbilicus the abdominal cavity was opened and about six ounces of clear peritoneal fluid was found. Exploration showed two portions of the small intestines completely filled with irregular masses extending in one portion for a distance of eight inches and in another portion for a distance of twelve inches. Through two enterostomy openings the masses were removed and found to be closely packed groups of ascarides lumbricoides. The enterostomy openings were closed, a cigarette drain was placed in the pelvis and the abdomen closed by layered sutures. Patient made an uninterrupted surgical convalescence, and was later referred to medical service for the treatment of intestinal worms. The number of ascarides lumbricoides removed was one hundred and fifty-four. Examination of the fæces showed innumerable eggs of the above-mentioned parasite. Patient was discharged six weeks after entrance and at present date, March 1, 1923, has had no further trouble, although eggs are still present in fæces.

INCISED WOUND OF THE FOURTH AND FIFTH CERVICAL NERVES

DOCTOR KELLY presented a man, thirty-eight years of age, who was admitted to St. Mary's Hospital, June 27, 1922. This man on June 1, 1922, while doing some repair work at home, was standing on a table holding a putty knife. The leg of the table broke, throwing him to the ground, the putty knife piercing his neck. In the emergency room he was given a careful examination, laceration over right sterno-mastoid muscle being the only injury. Five sutures were inserted. When seen in his room he complained that his arm was numb from the shoulder (right) down, only motion he was capable of was at the wrist. Further examination showed palsy of right arm and forearm, slight numbness of right thumb. Inability to raise right arm or forearm. Flexes and extends finger and wrist. No wrist drop. Has power of partial pronation and supination. Grip in right hand good.

Motor Phenomena.—All motor power except flexion and extension of fingers and wrist and partial pronation and supination of arm and forearm lost. Cannot raise arm or forearm from bed.

Sensation.—All sensation, both superficial and deep in fingers, hand, forearm, and lower one-third of arm O. K. Almost complete anæsthesia over deltoid and lower portion of trapezius muscles, certainly superficial sensation completely lost. (Fig. 1.) Deep sensation impaired below deltoid to about middle of third of arm. There is undoubtedly a lesion in the cervical plexus, probably a partial severance of the fourth and fifth cervical nerves, affecting the spinal branch of the spinal accessory nerve, which supplies the circumflex which also begins at the fifth cervical nerve and supplies the deltoid.

Diagnosis.—Lesion of the cervical plexus, probably affecting the fourth and fifth cervical nerves and in all probability a severed nerve or partially so, rather than a hemorrhage, since the patient had a complete loss of function from the time of injury.

Operation.—Temporary sutures removed from wound of neck. It was then found that the skin incision was continuous with and parallel to the fibres of the sterno-mastoid muscle, just outside of the carotid sheath. This wound was enlarged through the sterno-mastoid muscle and after considerable difficulty and deep retraction there was found a complete severance of the right fourth and fifth cervical nerves. (Fig. 2.) This wound was so close to the vertebra that the periosteum from the right lateral process of the fourth cervical vertebra was chipped off. The cut ends of both nerves were approximated by two interrupted sutures of fine silk and the wound closed without drainage. Patient made an uninterrupted convalescence, and was in the hospital twenty-six days.

Condition six months later; examination by Dr. M. A. Burns, December 29, 1922.

Motor Phenomena.—Patient has a partial palsy of upper right extremity. Grip good, unable to abduct arm very well, seems to annoy him at shoulder joint. Able to adduct very well and seems to have considerable power performing this movement; unable to flex forearm

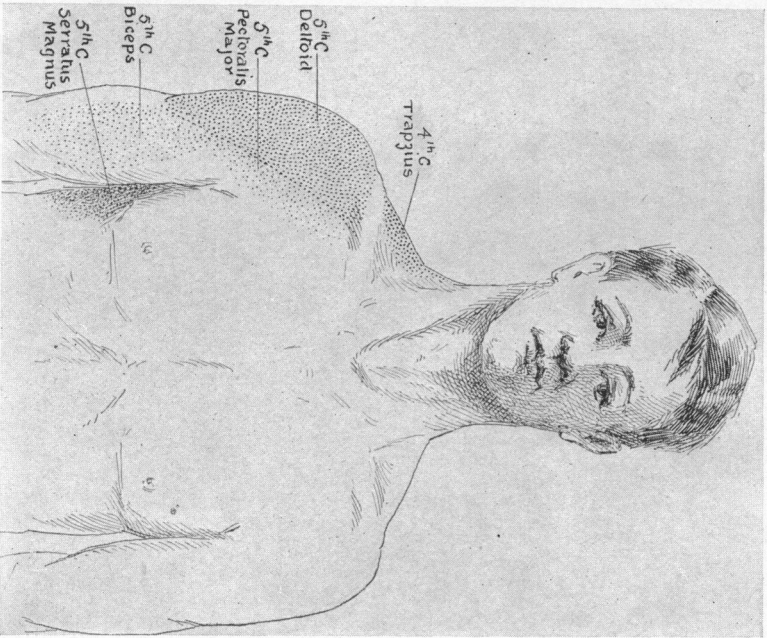


FIG. 1.—Showing area of distribution of muscular paralysis and loss of sensation.

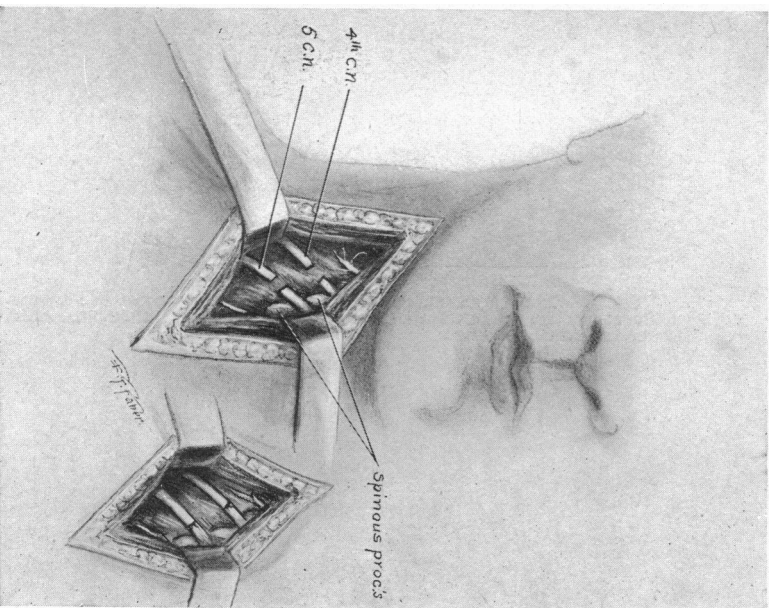


FIG. 2.—Case II, shows retraction of primary wound of skin, fat and sternomastoid muscle, exposing the severed ends of the fourth and fifth cervical nerves. Insert shows method of repair.

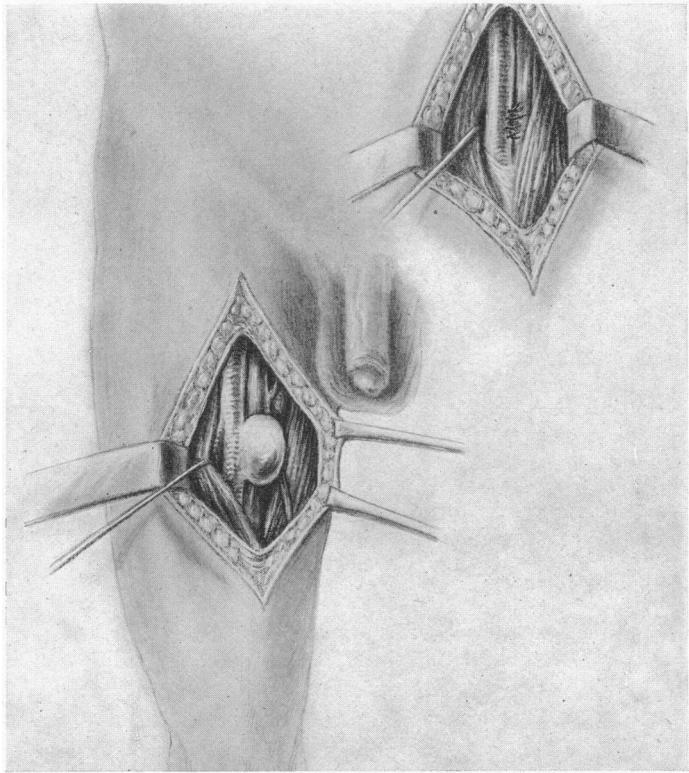


FIG. 3.—Case III, shows formation of traumatic aneurism. The sac was readily removed from the artery and the wound of artery closed by four interrupted sutures, as shown in insert.

BULLET WOUND OF THE THIGH

without aid of other hand, but after he gets forearm up, he can use hand very well. There is no evidence of wrist drop. The forearm is unusually well developed, but his arm shows evidence of considerable atrophy, especially over the deltoid and trapezius muscles. Patient still unable to raise arm of itself, but has considerable power in it after he flexes it with the aid of the other hand.

Sensation.—Sensation is normal over deltoid, and almost normal over the trapezius muscles, except there is some slight diminution in sensation just around the insertion of the deltoid. There is a very marked degree of sensation returned and perfectly normal over deltoid and trapezius, and also a marked increase in motor power, although there is some palsy still remaining.

Electrical Reactions.—It is impossible to take the electrical reactions at this time.

March 1, 1923.—Muscular power slowly increasing. Muscular atrophy disappearing. Patient has been able to drive his automobile for the past two months.

BULLET WOUND OF THE THIGH PRODUCING TRAUMATIC ANEURISM OF FEMORAL ARTERY

DOCTOR KELLY presented a man, twenty-three years of age, who was admitted to St. Mary's Hospital, October 31, 1922, suffering with bullet wound of the right thigh, accidentally received.

Examination on admission showed a bullet wound of the right thigh with wound of entrance on surface of thigh about the middle and in the line of the femoral vessels. Wound of exit on posterior surface of thigh level as wound of entrance. Considerable bleeding had taken place, but the patient was not in condition of extreme shock on admission. Wound of entrance and exit thoroughly cauterized and dry, sterile compression dressing applied and a prophylactic dose of anti-tetanic serum administered in the receiving ward. Blood examination on admission showed red blood cells 4,150,000, white blood cells 10,600 and hæmoglobin 80 per cent. As there was present pulsation over the popliteal artery after admission, it was considered probable that the femoral artery was not injured. The patient was carefully watched and after the sixth day there began to take place an evening rise in temperature, accompanied by a localized swelling around the wound of entrance.

Operation.—Ten days after admission, under gas anæsthesia, an incision was made through the wound of entrance, with the idea of probably evacuating a localized collection of pus. There was a considerable spurt of bright red blood. The wound was hurriedly packed with gauze and a tourniquet applied high up on the thigh. The gauze was then removed, the wound enlarged and the femoral vessels exposed. Surrounding the site of the femoral artery there was an organized blood-clot in the form of a saccular aneurism. This was carefully removed and it was then found there was a wound of the inner portion of the femoral artery, with a loss of about one-quarter of its calibre (Fig. 3). Four interrupted lateral sutures of fine silk were then used

to close the wound of the femoral artery and a small rubber tissue drain introduced to the site of the suture. Upon removing the tourniquet pulsation was then noticed in the femoral artery below the line of suture and there was no leakage from the line of suture. The wound was then closed in layers except at the point of rubber tissue drainage. The drain was removed on the fourth day and the patient made an uninterrupted convalescence. At no time during the convalescence was there noticed any evidence of obstruction at the line of suture. Examination on March 1, 1923, shows wound entirely healed and the only symptom the patient complains of is a slight referred pain down the thigh to the knee.

DR. ASTLEY P. C. ASHHURST said that about a year ago, in reporting to this Academy a somewhat similar case, Doctor Muller brought up the question as to whether or not in civil life it was proper to explore such wounds without waiting for the further development of symptoms. Doctor Muller said that all authorities taught that one should not operate unless there was active hemorrhage at the time. This is of course according to the traditional rule; and it does not appear that either Doctor Muller's patient or Doctor Kelly's patient suffered any harm as a result of delay in the operation. They did right in delaying it, because there was no proof that any large vessel was injured. The presence of pulsation below at the time of injury is in accordance with what was seen during the war, when with no bleeding from the wound and continued pulsation in the peripheral branches, exploration sometimes revealed injury to the vessel; the French surgeons well described these cases as "lésions sèches" of the arteries.

At the time of injury a distinction is to be made between (*a*) lesions sèches; (*b*) pulsating hæmatomas (or diffuse traumatic aneurisms); and at a later stage, (*c*) traumatic aneurism (circumscribed). In military surgery wounds which may involve large blood-vessels are explored as soon after injury as possible, because *débridement* is required to prevent infection, and because the patients must be transported and cannot remain constantly under surgical care. In civil life infection is little to be feared, and the patients do not have to be transported. In both civil and military surgery, however, the presence of a pulsating hæmatoma demands early operation. But a circumscribed traumatic aneurism should be left alone. Even where it is possible to do a Matas operation, it is desirable to leave it alone for several months, at the end of which time the walls lining the cavity will be in a condition where the operation can be done with comparative safety. If one does it too soon after the injury, there is nothing to hold the sutures. Whether the return of pulsation in the peripheral arteries that has taken place in Doctor Kelly's case is due to collateral circulation or to persistence of the lumen of the femoral artery, it is of course impossible to tell.

DR. D. L. DESPARD said that he had a case of a man who was shot, the bullet passing between the artery and vein, cutting both. He immediately had tremendous swelling and cutting off of the circulation below. Operation seemed to be at once imperative; the wound in the artery was found and

GUNSHOT FRACTURE OF THE FEMUR

closed; the vein he had to tie; pulse returned and was present for a larger part of the next day. It was very faint, however, and the evening of the second day after operation it could not be felt at all. It returned in three or four days, evidently reestablished through collateral circulation. The man had complete recovery of circulation in the leg.

DR. HUBLEY R. OWEN showed again a case which he reported to the Academy some time ago of gunshot wound of the popliteal artery. At the time he reported it as a popliteal aneurism.

Since then he had operated on the man and found no aneurism but an aneurismal varix. There was a small opening between the artery and the vein, so small that he did not have to suture. He put in ligatures and the man made a good recovery. He had some swelling of the lower leg and had to wear a canvas stocking. Two or three weeks later he did a second operation and made a search for the small piece of bullet, but it could not be found. His Wassermann was negative.

GUNSHOT FRACTURE OF THE FEMUR AND WOUNDS OF THE FEMORAL VESSELS REQUIRING AMPUTATION

DR. DAMON B. PFEIFFER presented a negro man, aged twenty-nine, who was admitted to the Presbyterian Hospital at 10.30 P.M., December 25, 1922, on the service of Dr. John H. Jopson. About an hour previously he had been shot with a .38 calibre automatic pistol loaded with steel-jacketed bullets. He was hit twice, the first bullet causing a tangential wound of the anterior abdominal wall. The wound of entrance was in the right rectus just below the costal margin and the wound of exit over the left rectus at a point symmetrically situated. A transverse ridge, indicating the course of the bullet could be seen and felt between the two except where the tract had passed through the muscles. Examination showed no abnormality of the abdomen; he was not shocked; he presented no sign of loss of blood. Temperature was 99; pulse, 80; and respirations, 20 per minute. He complained of some dull pain in the right thigh, but on the whole was fairly comfortable and in good condition. The right thigh was enormously swollen throughout and the tissues were tense and hard. The thigh was warm but below the knee the leg was cold and no pulsation could be detected in the anterior or posterior tibial arteries. Sensation in the leg was present but diminished. There was a bullet wound of entrance on the outer aspect of the thigh at the junction of the middle and lower third. At this point the thigh was fractured. It was evident that a wound of large vessels was present and the situation made it probable that the femoral vessels were concerned. No thrill or bruit was present.

DOCTOR PFEIFFER, realizing that the condition probably called for amputation, decided, however, on account of the excellent condition of the patient, to determine whether a reconstructive operation could be done. He accordingly debrided the wound of entrance down to the site of fracture. As soon as the fascia lata was incised the muscle herniated through the wound under great internal pressure. The femur was extensively comminuted. The tissues in immediate relation were pulpi-

fied, and a large cavity was present filled with blood-clot, detached splinters of bone, and surrounded by infiltrated connective tissue and muscle. At the upper limit of this cavity the femoral artery could be felt pulsating. Below this point no pulsation could be detected. Release of tension and disturbance of the cavity resulted in active hemorrhage. The tourniquet which had been placed about the thigh was therefore tightened and an incision made on the inner aspect of the thigh to afford better access to the vessels. So great was the infiltration of the tissues that difficulty was experienced in locating the vessels and it was noted at about this time that the patient was showing signs of shock which made it doubtful whether he could endure any unnecessary prolongation in the operation. He therefore decided to amputate without delay. The lead core of the bullet was found in the large cavity and the steel jacket which had become detached lay beneath the skin on the inner side of the leg.

After an intravenous infusion of salt solution the man rallied well and made an uncomplicated recovery, excepting for a slight stitch infection of the uppermost sutures, which fortunately did not become communicated to the field of amputation. The vessels were later dissected and it was found that both the femoral artery and vein had been almost completely divided, being held together by only a narrow bridge of the posterior portion of the vessel walls. In addition there was a punctured wound of the femoral artery about one inch distal to the large wound. The reporter remarked that although vascular surgery has now reached the point where it is indicated to consider repair rather than ligation or amputation as primary procedures, this case violated all the conservative rules laid down by Makins for the performance of suture. There was no reasonable probability of maintaining the wound in an aseptic condition. The wounds of the vessels were multiple and extensive. Circular suture would have been required and immobilization in a position to secure freedom from tension was impossible because of the fracture.

Concerning the necessity for amputation it should be realized that ligation of the femoral vessels at the point of origin of the anastomotic magna would be likely under any circumstances to be followed by gangrene or such damage to the leg that its usefulness would be abolished. The added danger introduced by the comminuted fracture made the risk to life prohibitive. Preliminary exploration, however, was indicated by the fact that wounds of the branches of the femoral artery may at times cause a hæmatoma of great dimensions simulating a wound of the parent vessel. In such a case simple ligation would probably save the leg.

REPAIR OF THE MUSCULO-SPIRAL NERVE

DR. D. L. DESPARD presented a boy, aged thirteen years, who was admitted to Abington Memorial Hospital, May 11, 1919, having been injured by receiving a load from a gun at 12 or 15 feet distant. The outer and posterior part of the triceps was carried away and with it the musculo-spiral nerve for about four inches. The skin wound was so extensive that efforts toward primary repair of the nerve were not wise.

REPAIR OF THE MUSCULO-SPIRAL NERVE

On October 15, five months after the injury, the wound having completely healed, the ends of the nerve were exposed, and by stretching, the gap of four inches was reduced to two inches, the bulbous ends were freshened up and both ends sectioned half through about an inch and one-third from their extremities and split longitudinally to within a third of the ends, the flaps thus formed were approximated, bridging the gap. The exposed nerve was then snugly surrounded by a cuff of fascia lata from the thigh. The wound healed by first intention, and in about two months there was some evidence of the reestablishment of function.

The progress was very slow for a while, and he lost sight of the patient until June of 1921, when he then saw him his recovery was very satisfactory.

His reason for reporting this case is that this method has not been of late years generally popular, and to show that in some cases it is justifiable, especially in the very young, where nerves available for bridging the gap are so small as not to be suitable.

DR. DE WITT STETTEN (of New York) commented on the result obtained in this patient with musculo-spiral paralysis. He was especially interested in this case because he had done the same operation once himself and because the method is one that is universally condemned by neurological surgeons to-day. Eleven years ago he saw a case of complete musculo-spiral paralysis secondary to an operation for osteomyelitis of the humerus. The nerve had evidently been severely damaged during the bone operation because he found a dense scar in the nerve which he resected, leaving a defect of about an inch and a half. He then did exactly the same operation that Doctor Despard had performed, turning down the flaps from either end of the resected nerve to bridge the gap. A few days after the operation, in glancing through Sherren's book, "Injuries of Nerves and Their Treatment," he was much shocked to find that this method was described as one only to be condemned and that the results were as unfavorable as the method would lead us to expect. The author referred to other methods to be used in such cases and laid particular stress on the auto-transplantation of relatively silent sensory nerves—for example, the radial nerve from the forearm in musculo-spiral paralysis. He felt that he had made a very serious blunder and was more or less convinced of that fact after a year had passed without any return of function. But after fourteen to sixteen months, the patient began to show some restoration of muscular power in the extensors of the wrist and fingers and within the next four to six months he made a complete recovery. The method may be a bad one, but certainly it sometimes works rather well—even better than the recommended methods—as these cases have demonstrated.

DR. ASTLEY P. C. ASHHURST said that at the first joint meeting of the Academy with the New York Surgical Society (ANNALS OF SURGERY, 1920, vol. lxxii, p. 408) he reported three cases of nerve suture, two of the patients having been treated in this way with flaps turned down from the ulnar or

median nerves, with perfect recovery. The neurologists say recovery is not possible by this method and that the patients get regeneration of the nerve in spite of the operation. Perhaps they might claim that the nerve impulses in Doctor Despard's patient do not come through the collateral circulation, as it may be called, which was established by the operation; but that the nerve fibres have eventually perforated the bulbous scar and have found their way to the distal end of the nerve along the channel established by the tube of fascia lata. But in his own two cases, where the neuroplasty was a primary operation, for recent injury, no fascial tubes of any kind were placed around the nerves.

SPLENECTOMY FOR ADVANCED SPLENIC ANÆMIA

DOCTOR DESPARD recited the history of a boy, aged thirteen years, who was admitted to Methodist Hospital, March 13, 1922, with an enlarged abdomen and swollen legs.

His general health had been good until 1914, when he developed acute mastoiditis and was operated upon for it. He was reoperated upon November the same year for a recurrence of the trouble.

In the spring of 1916, he had pneumonia; following this he developed acute appendicitis, was operated upon, an abscess drained, and the discharge continued for four months. During this time he was said to have had an abscess of the liver. The stools contain pus.

Present Illness.—About six months after the appendiceal wound had healed, he felt badly, and it was noticed that the abdomen was swollen and he had lost a good deal of weight.

In the summer of 1920, after eating raspberries, he had an attack of acute indigestion and vomited blood and the abdomen was swollen at this time.

In 1921, he had a similar attack, and while he did not vomit blood, he passed it in the stools. The abdomen was swollen at this time, but this soon disappeared.

In December of 1921, he fell while playing and hurt himself, was nauseated and passed dark tarry stools. He has been losing weight, looked anæmic and felt badly since then. For the past three weeks he had been in bed. The abdomen is gradually getting larger, but he had not had tarry stools since being in bed.

Physical examination showed a very emaciated looking boy, slight œdema under eyes. Head, ears, eyes and teeth normal. Tonsils are not enlarged. The lungs and heart are normal. The abdomen is greatly distended with fluid, which embarrasses the respirations. Scar of previous operation below the umbilicus and to the right. The extremities are slightly œdematous and the reflexes are normal.

Clinical Notes.—Abdominal paracentesis March 16, 1922, and six quarts of turbid straw-colored fluid removed.

March 14, 1922, blood examination: hæmoglobin 60 per cent., red blood cells 3,040,000, white blood cells 3000, polymorphonuclear cells 50 per cent., small lymphocytes 30 per cent., large 20 per cent. Stools were negative for blood.

SPLENECTOMY FOR ADVANCED SPLENIC ANÆMIA

Chemical Examination of Blood.—Sugar, 0.1000 per cent.; urea, 18 mg. per 100 c.c.; creatinin, .9 mg. per 100 c.c.; chlorids, 6.25 mg. NaCl per L.; uric acid, 1.5 mg. per 100 c.c. Wassermann negative.

Examination.—Ascitic fluid March 16, 1922, color pale yellow, turbid, no coagulation, albumin 1.9 per cent. After paracentesis the spleen was found to be enlarged and to extend 6 or 7 cm. below the costal border.

April 4 paracentesis again performed, yielding 196 fluid ounces, temperature is ranging between normal and 100 degrees.

Blood Examination.—April 4, 1922, hæmoglobin 55 per cent., red blood cells 2,800,000, white blood cells 2400, polymorphonuclears 60 per cent., small lymphocytes 28 per cent., large lymphocytes 8 per cent., monomorphonuclears 4 per cent., coagulation time 3 minutes.

April 6, 1922.—Splenectomy through a left rectus incision. The spleen was very large, extending to the crest of the ilium. The number of adhesions to diaphragm were few and easily broken up; the liver was enlarged and relatively smooth. A large amount of milky fluid was liberated on making the incision.

Before closing the wound an extensive epiplopexy was done. The patient was somewhat shocked from the operation and an immediate transfusion of 500 c.c. of blood by direct method was performed. The wound healed by first intention, but notwithstanding this the temperature range was from 100 to 103 degrees, gradually subsiding, but in the neighborhood of 100 at the time of discharge from the hospital.

The blood examination nine days after the operation on April 15, 1922, was hæmoglobin 68 per cent., red blood cells 3,200,000, white blood cells 11,000.

A guinea pig killed one month after inoculation with ascitic fluid showed no evidence of tuberculosis.

Continued favorable reports of his progress have been received and he has gained weight, is going to school and seems to be well.

The reporter remarked that the reason for presenting this case was to call attention to the fact that in very serious cases of splenic anæmia, operation may under certain conditions bring about apparent cures.

The function of the spleen may be grouped under three heads: (a) Destruction of worn or feeble red cells, white blood cells and platelets. (b) The production of lymphocytes. (c) Filtering toxic substances and bacteria from the blood.

Normally the blood supply is vastly more than required for its own needs. Under the stimulation of toxins, possibly not always bacterial, this function becomes perverted, as evidenced by the wholesale destruction of red blood cells, the leucopænia, and the resultant injury to the liver in the production of a portal cirrhosis.

It would not seem illogical to assume that detrimental substances other than those that are known, might have their origin in an organ that had departed so far from the normal.

The removal of the spleen does good by diverting toxins from the blood,

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or possible toxins originating in the spleen from the liver, which if continued, result in fibrosis of that organ and ultimate destruction of the liver cells.

It is for these reasons that the best results are obtained in the removal of large spleens that are sending immense quantities of blood to the liver laden with poisons, and the operation must be relatively early before irreparable injury has been done to the liver. It must be borne in mind that the liver has powers of regeneration, and may in time recover from considerable injury.

Small spleens are not so charged with possibilities for damage, and their removal is not accompanied with such marked improvement, even in hæmolytic jaundice.

The specimen removed is a spleen markedly enlarged, moderately soft and dark in color. On sectioning there is noted a considerable thickening of the capsule with much fibrosis throughout the entire organ. The pulp is soft and wet and much blood exudes from the cut surface. Weight is 1460 gms.

Sections show spleen in which there is considerable dilatation of the sinuses which are filled with blood. There is a distinct increase in connective tissue throughout the section. Some sclerosis of the splenic vessels is found and the capsule shows a marked thickening. The trabeculæ are also much increased in size. The gross and microscopic appearances of the spleen are consistent with those of an early Banti's disease.

TECHNIC OF INGUINAL HERNIOPLASTY

DR. DE WITT STETTEN, of New York, read a paper with the above title, for which see page 48.

DR. JOHN H. JOPSON said there are two or three fallacies in the general belief regarding hernia. A great many failures are due to the fact that the individual case has not been studied at the time of operation. The operation for hernia is a plastic one and there are varying conditions to be met just as in any other types of plastic operation. Failure is due to the fact that many surgeons simply go through the motions of the operation. He thought the Fergusson operation was a great step backwards in hernia work. Again, one can get muscle to adhere to fascia by suture, in spite of statements to the contrary. He knew that it will grow there because he recalled two cases where he operated for femoral hernia through the inguinal route, after an inguinal hernia operation had been performed, doing Ruggi's operation, and found the fibres of the internal oblique and transversalis so closely adherent to Poupart's ligament that one might have thought they had been implanted there originally instead of sutured by the surgeon.

DR. HUBLEY R. OWEN said that a couple of years ago he read a paper on hernioplasty before the State Medical Society; and, on looking up data for this paper, he found only two papers which gave statistics which were accurate. It was because these surgeons or some member of their staffs had personally examined the cases for recurrences.

TECHNIC OF INGUINAL HERNIOPLASTY

Doctor Ashhurst in his surgery cited Coley's statistics and said recurrence occurred in very few cases. Blake quoted 25 per cent. recurrences. In the Mumford series of 97 there was one recurrence. Da Costa quoted Coley's figures. Rosenthal quoted 10 per cent. Masson, of the Mayo Clinic, out of 17,017 cases in a series, less than one per cent. recurrences. There are few statistics which differentiate the direct from the indirect, and statistics without this differentiation are of little value. Taylor of the John Hopkins reported a series of 230 cases for indirect with 46 recurrences or 5.6 per cent. and 256 indirect with 18.08 per cent. recurrences.

Bruner reports 21.4 per cent. recurrences and Moscovitz 6.86 recurrences. Earle operated on 38 cases with no recurrences.

Unless a man examined his own cases at regular intervals of six months to two years he can't give accurate statistics. Taylor reported that of his cases examined at the hospital, there was recurrence in 29.7 per cent. and of those heard from by letter 6.3 had recurrences.

The speaker had performed Doctor Stetten's operation on 28 cases. Among these he had had but one recurrence. This recurrence was in a patient fifty-one years of age, operated on for bilateral hernia. There was a recurrence on the left side before he left the hospital. He could not definitely claim, however, that the other 27 cases had been cured, because some of these cases were but recently operated upon. None of them have been operated upon for a length of time to consider the cure absolute.

There was an excellent article in a recent *ANNALS OF SURGERY* by Erdman, giving the statistics of hernia on Pool's service. The great value of these statistics was that every case was examined by Doctor Pool or by a member of his staff. Of Erdman's cases there were 664 oblique hernias with 3.15 per cent. recurrence and 313 direct hernias with 16.61 per cent. recurrence. There were 255 indirect hernias with 17 per cent. recurrence.

From his own experience he believed that Doctor Stetten's operation has been more satisfactory than any other operation for direct hernia. Doctor Stetten discussed the question of age in so far as recurrence is concerned, Doctor Taylor of Johns Hopkins reports that 50 per cent. of the hernias recur after forty years and 25 per cent. after fifty years of age. Doctor Stetten does not agree with Doctor Pool that the operation is inadvisable after fifty-five years of age. The speaker agrees with Doctor Pool, if he finds a patient of even fifty years of age can wear a truss and the truss holds his hernia satisfactorily, he advises him to wear a truss, providing that the wearing of a truss does not interfere with his work. If he elects to be operated upon, he operates upon him, but tells him frankly the statistics regarding recurrence. The oldest case of his series was a man seventy-one years of age with a bilateral hernia. His hernia on the right side was of the type which is claimed to have "lost the right of domicile." He was unable to purchase a satisfactory truss. He has had no recurrence as yet, but the operation was only performed six months ago. Statistics are of no value until two years after an operation for hernia.

He did not think that Doctor Stetten's operation to be necessary in all cases. We should be guided by the type of case. An indirect hernia, especially in a child, requires only the ordinary Fergusson operation. The Stetten operation is advisable for a direct hernia and one where the muscles are weak.

As to anæsthesia he had not been able to get good results with local anæsthesia. The Johns Hopkins statistics show a larger percentage of recurrences in cases done under novocaines than those under general anæsthesia. He uses nitrous oxide gas, often infiltrating the line of incision with a little gas, and when he cannot do that he gives spinal anæsthesia.

Concerning the time in bed, he tries to keep all his cases in bed for two weeks, and direct hernias for 21 days. In the police and fire departments the men are not allowed to assume duties of any kind until four weeks after discharge from the hospital after a hernia operation and no active duty until three months after discharge from hospital.

DR. ASTLEY P. C. ASHHURST said that he did not know what his own results were, but he believed the statement quoted in his text-book from Coley's statistics to be correct concerning recurrences, and that after a properly done Bassini operation, 95 per cent. of indirect hernias do not recur. In the other figures quoted just now by Doctor Owen, the recurrences were approximately five per cent. after the Bassini operation where special attention has been paid to high suture of the neck of the sac. In direct hernias every one knows there is a much greater proportion of recurrences. The conjoined tendon is never absent. It may be defective but it is never deficient: there is always some place where the lower fibres of the internal oblique and transversalis muscles are inserted, and that is the conjoined tendon.

DR. DE WITT STETTEN (in closing discussion on his paper): In regard to Doctor Owen's remarks he could not quite agree with him on the age question. A man fifty-five or even older, who is troubled by a hernia is as much entitled to relief as one of thirty-five. This is especially true when the operation is done under local anæsthesia and the risks of general anæsthesia are eliminated. Although it is a fact that the two recurrences he had observed were in men of fifty-five and fifty-six years of age, respectively, in general, his results certainly do not seem to indicate an unusual tendency to recurrence in older individuals. In his last series there are from twenty to thirty cases in men of fifty or over who seem cured, and he had made it a rule to examine these patients about once a month. This last group is composed mostly of private patients over whom he had relatively good control, and while not all have appeared as ordered, the large majority have reported regularly. To be sure, as Doctor Ashhurst has indicated, it is a bit too early to pass judgment in some of the cases. One should wait at least two years after operation before being certain of a non-recurrence.

Doctor Owen has pointed out that this particular technic is more complicated than the old Bassini operation and has suggested that it is not absolutely necessary in every case. He is quite correct. In a child, say of ten years

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of age, suffering from a simple congenital hernia, with a small, thin sac and a ring the width of a lead pencil, the usual Bassini operation is almost certain to effect a permanent cure and this more elaborate operation may be dispensed with. He had been using this technic in practically all cases for purposes of practice and study, but its main indication is in old, large herniæ, especially in the direct variety and in recurrences, particularly in the types that were formerly considered incurable without some form of rectus muscle, anterior rectus sheath or free fascia transplantation.

With the rarest of exceptions, he had had splendid success with local anæsthesia. In this last series there was only one case in which he was forced to switch to general anæsthesia because the patient was so neurotic. He was so unreasonable that he began to cry out at the first needle prick and he really should never have tried to continue with local anæsthesia. Formerly he frequently took out the appendix in a right-sided hernia under local, infiltrating the mesenteriolum before ligating. He had found, however, that the search for the appendix and the drag on the mesentery during its delivery gives the patient an uncomfortable colic and now, when he does an appendectomy, he gives the patient a few whiffs of nitrous oxide while locating and removing the appendix.

He had found that, just in those cases where the conjoined tendon is defective, the overlapping of the external oblique aponeurosis beneath the cord compensates for that lack of development. In fact, it was to take care of this type of case that the idea originated. In these cases the external oblique aponeurosis is often well developed, sometimes actually hypertrophic, and the suture of the conjoined tendon to Poupart's could really be disregarded altogether.

He agreed with Doctor Jopson concerning the many current fallacies in views on hernia and he seconded his opinion as to the Fergusson type of operation without cord transplantation, especially as regards direct hernia. If it is admitted that non-transplantation of the cord is wrong in principle and favors recurrence in practice, then the maximum transplantation possible, as in the technic advocated, should be right and should offer the best chance of a permanent cure. Another fallacy that has persisted is the idea that covering the cord with the external oblique aponeurosis, allowing the cord to emerge obliquely, is necessary as a part of the hernial repair. Now when this is done and a recurrence develops, the new sac protrudes under the aponeurosis, indirectly through the old internal ring, or directly, medial to the epigastric vessels, irrespective of and in no way influenced by the aponeurotic covering over the cord. His plan is therefore to use everything available to strengthen the weak spot, which is all medial to the point of exit of the cord, whether the hernia be direct or indirect. It is of much more important to hug the cord, at its exit, as closely as one can with safety than to have it emerge obliquely. If there is a more or less straight emergence of the cord, without kinking or angulation, the snugest possible suture of the ring may be made with the least chance of interfering with the testicular circulation.