TRANSACTIONS

OF THE

PHILADELPHIA ACADEMY OF SURGERY

Stated Meeting Held April 6, 1925

DR. EDWARD B. HODGE, the President, in the Chair

BULLET PERFORATING VENTRICLE OF HEART AND MIGRATING BY WAY OF ARTERIAL CIRCULATION TO SUPERFICIAL FEMORAL ARTERY

DR. JOHN H. JOPSON presented a colored man, aged thirty-nine years, who was admitted to the Polyclinic Hospital, August 28, 1924, on account of a gunshot wound of the chest just received at close range. He was a large, well-developed and well-nourished man in a moderate state of shock. There was a gunshot wound of the left thorax, the bullet entering at the third interspace, about one and one-half inches from the midline of the sternum. No point of exit could be found. There was a slight sanguinous discharge from the wound. Respirations were dyspnœic in character. His lungs revealed nothing abnormal. The heart rate was somewhat increased but was regular. The cardiac sounds were distinct. No murmurs were heard. There was no evidence of hypertrophy. The abdomen and extremities were grossly negative. He complained of some pain in the right leg. Wassermann was negative. Urine was negative.

He was given treatment for shock and then placed in Fowler's position with enough morphia to insure rest. A röntgenogram was taken in an endeavor to localize the bullet, but no signs of foreign body in the left chest could be detected. There was a density, throughout the whole left chest, about the consistency of the liver, which suggested fluid. The temperature was 103.2, pulse 120, respiration 40. There was slight cough but no bloody expectoration. Aspiration of the left pleural cavity on two occasions resulted in a dry tap. A re-ray of his chest on September 5, again failed to demonstrate any evidence of foreign body. The opacity in the left chest, resembling fluid was still present. As the patient complained of pain in the right lower leg, an X-ray was taken of the right tibia and fibula. This was reported negative.

Further röntgenographic study on October 10 disclosed many fibrous adhesions in the left chest. These were thought to be due to old exudate or blood, which had been absorbed. There was an adhesion of the left diaphragm but no foreign body was detected. The patient was transferred to the Medico-Chi Hospital on October 13, for further study. His temperature still remained elevated and a röntgenogram, taken on December 2 was reported as follows: No evidence of effusion at this date. Still abnormal widening in the mediastinal shadow. A bullet was detected at right thigh, internal mid-region.

On December 16, the bullet was localized by fluoroscope. It was situated in the right thigh, at the junction of the middle and lower thirds, on the inside of the femur. At this time all chest symptoms had practically disappeared. He had a slight elevation of temperature, which was apparently due to a cellulitis and abscess of the right leg, on the outer side, about the middle third.

There was an absence of pulsation in the right popliteal and anterior and posterior tibial arteries. There was no swelling or other evidence of defective circulation in the limb, except this absence of pulsation in the arteries.

A review of the history and study of the X-rays, and of the fluoroscopic findings, apparently show that the bullet, of 38 calibre, had entered the precordial region, had perforated the pericardium and entered, either the aorta, which was most probable from the situation of the wound, or the upper portion of the left ventricle, and was swept at once into the arterial circulation, finally lodging in and plugging the right superficial femoral artery, in the upper portion of Hunter's canal.

The collateral circulation had taken care of the nutrition of the limb below. Further study of the X-ray plates, along with the history, led to the belief that the shadow in the left chest was due to a large hemorrhage into the pericardium, although this has not been verified by repeated, careful examinations by the physicians, who saw him in consultation at the Polyclinic Hospital.

Aspiration of the right lower leg showed the presence of pus and a free incision was made in the outer side, middle third, and a considerable collection evacuated beneath the deep fascia and dissecting between the extensor muscles. Dakin's tubes were inserted two days later and active dakinization of the wound was begun. There was rapid improvement and the patient was discharged on November 4, with instructions to report to the dispensary for daily dressings. On November 12, he had some pain in the line of incision. The wound was incised and a quantity of pus was evacuated. He was readmitted to the hospital on November 15, for a more complete incision of the infected leg. His temperature, at the time of re-admission, was 99, pulse 110, respirations 24. An incision and drainage of the abscess was made on November 17, and the wound was again actively dakinized. Temperature remained slightly elevated until December 14, when it rose to 102°. Aspiration revealed the presence of a pus pocket, in the same region. This was incised and drained on December 19.

Incision and drainage of pus pockets were again made on January 21 and January 31, 1925. The pulsation in the vessels returned several weeks after his transfer to the Medico-Chirurgical Hospital. He has been very ill, from time to time, from relapsing infection of the leg, cultures from which showed non-hæmolytic streptococci. At no time has there been any local reaction at the site of the bullet, and for this reason, no attempt to remove it was considered indicated. It is quite possible, however, that the infection travelled downward from the site of the bullet, as there was absolutely no portal of entry elsewhere as determined by repeated, exhaustive examinations by Doctors Rothschild and Farrell.

Examples of the entrance of foreign bodies, bullets or shell fragments into the circulation, while rare, have been noted with increasing frequency since the introduction of the X-ray and especially since the last war. Matas, in his article on Military Surgery of the Vascular System, volume vii, *Keen's Surgery*, gives a highly interesting résumé of the subject.

The cases may be divided into two general classes:

I. Those in which the foreign body enters the left heart and is carried through the aorta into the smaller arteries, being arrested at a point, where the lumen of the artery becomes too small to permit further passage.

Matas refers to six cases of this type, the oldest one reported in 1837.

II. Cases in which the foreign body enters a vein and progresses from the periphery to the right heart. Reaching the auricles, it may remain there, or progress further through the pulmonary artery to the lung, or it may pursue

a reversed course from the right chambers into the venous circulation against the current. Those cases, migrating with the circulation, naturally exceed in number those migrating against the current. They may even enter the pulmonary artery and travel against the current into the right heart.

ACUTE DILATATION OF THE STOMACH AND TETANOID CONVULSIONS FOLLOWING OPERATION FOR HERNIA

DR. JOHN H. JOPSON presented a man, aged thirty-seven, who was admitted to the Medico-Chi Hospital, February 1, 1925, for operation for a large right scrotal hernia. He was a well-nourished, rather stockily built man.

Operation was performed by Doctor Jopson, February 2, and a complete, indirect, inguinal hernia was found with the major portion of the small intestine in the sac. Radical cure was effected by the Stetten modification of the Bassini method.

The patient reacted well from the anæsthesia and slept the greater part of the day, vomiting once that evening. He had a fairly good night but was nauseated and vomiting the following morning. Temperature was 100.2, pulse 110, respiration 28. Gastric lavage was administered, but the vomiting continued and a Jutte tube was inserted through the nostril into the stomach and fixed in place with adhesive for constant drainage. The material obtained from the stomach consisted of dark brown, granular appearing fluid. The abdomen was somewhat distended and hiccoughing occurred at short intervals. Twenty-five minims of ether were given intramuscularly for the hiccoughs. The Jutte tube continued to drain this dark brown material, but as the fluid became clear, the tube was removed from the stomach. One thousand c.c. of normal saline solution were given per hypodermoclysis.

Vomiting again occurred and the tube was re-inserted into the stomach. Hiccoughing still continued and the abdomen remained somewhat distended. Asafætida enemas were given to relieve this condition and were effectual. The fourth day after operation, the patient's condition was decidedly worse. He became delirious, cried out at intervals, and began to have convulsive seizures accompanied by cyanosis and unconsciousness. These convulsions occurred at three-minute intervals and began as follows: The eyes would roll upwards and the pupils became dilated and would not react to light. Twitching started about the mouth, extending over the face, and the arms were raised and held up in tonic contractions. The hands were flexed at the wrists, but the typical tetanoid position was not observed. The respirations were rapid at first, and then held for ten to fifteen seconds in full inspiration. Nearly all of the body muscles appeared to be affected; the abdominal muscles became taut and the head was slightly extended. The leg and thigh muscles appeared to be only slightly affected.

The patient was extremely cyanosed with each attack and the fingers and hands remained somewhat cyanotic following each seizure. Oxygen inhalations were given, with the idea of combating the extreme cyanosis. and appeared to have a decided effect in checking the convulsions. When the inhalations were stopped, the convulsions would recur, and in consequence the tube from the oxygen tank was placed in the nostril and held there with straps. His temperature was 101, pulse 120, respiration 24.

The urine was acid in reaction and was otherwise normal. The blood picture showed 3,530,000 red cells, 9300 whites, and 70 per cent. hæmoglobin; 10 small lymphocytes, 4 large lymphocytes and 86 polymorphonuclears. The blood sugar was 149; creatinine 1.5; uric acid 4.1; urea 47; bicarbonate CO_2 88 per cent., and calcium 12 mgms. It was unfortunate that an estimation of

the blood chlorides was not made. Glucose solution was given per rectum but was expelled. The sixth day following operation, the patient began to improve and retained small amounts of nourishment given by mouth. Two thousand c.c. of normal saline were given per hypodermoclysis.

Convulsions again began to recur, coincident with the supply in the oxygen tank running out, but when the oxygen inhalations were renewed, the convulsions again ceased. There was incontinence of urine and fæces. The oxygen tube was removed on the seventh day, but the patient continued to have slight convulsions until the twelfth day following operation. Hiccoughing also occurred at intervals up to this time. During the course of his treatment he was given 8000 c.c. of normal saline solution per hypodermoclysis; also calcium chloride, ten grains intravenously for three doses.

A review of the history and symptoms in this case suggests that it is an example of the group of cases which are at present designated as cases of alkalosis. It corresponds in many respects to those which have been reporter rather frequently in the recent literature under this name.

The sequence was as follows: A very large hernia which was reduced with considerable difficulty because of the many coils of small intestine in the sac; acute dilatation of the stomach which required prolonged drainage; generalized convulsions, but which were not particularly of the tetany type, accompanied by delirium, loss of consciousness and marked cyanosis; a high bicarbonate CO_2 content of the blood plasma.

This condition has been attributed by some to rapid extraction of the HCl from the economy through the gastric juice. It, perhaps, furnishes a warning against the too prolonged use of the Jutte tube in cases of acute dilatation of the stomach, in intestinal obstruction and peritonitis. We have used the Jutte tube very frequently and have been enthusiastic over the results obtained in the class of cases mentioned. We have also noted in one or two other cases, what we thought were slight unfavorable symptoms from the very thorough drainage which it affords. These might have been due to dehydration. We have never seen such symptoms approach the danger line before.

It has been stated in recent literature that a ketonurea was observed in certain tetanoid conditions, ascribed to an alkalosis, because of the high bicarbonate CO_2 content of the blood plasma. This should emphasize the necessity of a thorough study of the blood chemistry, particularly with reference to the bicarbonate CO_2 content, in these cases, as the condition may otherwise be considered an acidosis and the wrong treatment instituted.

OPEN OPERATION IN AN ADULT FOR IRREDUCIBLE FRACTURE-DISLOCATION OF THE HIP

Dr. John H. Jopson described the history of a man, aged fifty-two, who was brought into the Polyclinic Hospital, November 11, 1924, with a history of having been injured in a street car accident. While getting off a street car, the car started, before he had alighted, throwing him to the ground and dragging him across the street. When admitted he was in a state of shock. His head and neck were negative except for a slight laceration of the nose. A few wheezing râles were heard on inspiration over both lungs. There was no cardiac enlargement and no murmurs were heard. His left leg showed limitation of motion at the left hip. The thigh was adducted and internally rotated and there was about 2½ inches of shortening. There was considerable swelling and ecchymosis about the hip and thigh. The right leg was normal.

A röntgenogram showed the left femoral head dislocated upwards, and

apparently backwards. There also seem to be small fragments of bone present, which may be due to fracture. The neck seems normal.

Reduction was then attempted by Doctor Rothschild under ether anæsthesia, but was unsuccessful, and a Buck's extension was temporarily applied with sixteen pounds of traction.

Reduction was again attempted by Doctors Willard and Rothschild on December 2, but was unsuccessful. Röntgenographic examination at this time, showed that the head of the femur was displaced upward and posteriorly from the acetabular cavity, and that there was a fragment of bone, probably from the head, in the acetabular area.

December 7, he was transferred to the Medico-Chi Hospital, where reduction under anæsthesia was again attempted by Doctor Jopson but without success. Twenty pounds of traction with Buck's extension was then maintained until December 23, when open operation was performed by Doctors Jopson, Willard and Rothschild. The anterior aspect of the capsule was exposed by a sub-periosteal elevation of the glutei muscles. The capsule was opened by an anterior, external vertical incision and three fragments of bone, broken from the head, were removed. Two of the fragments were about 2 cm. in diameter and were lying comparatively free and covered by cartilage. The third fragment, about 4 x 2½ cm. in diameter, was included in the capsule. The rectus tendon was divided to facilitate exposure and reduction. The head of the bone was further exposed by retraction of the glutei. Doctor Willard then manipulated by the Bigelow method, with Doctor Jopson directly manipulating the head with skids. Two other assistants made forward pressure over the trochanter. The upper undivided fragment of capsule acted as a hamstring and had to be cut.

The head was brought to the posterior edge of the acetabulum by adduction and flexion and upward traction on the knee. The edge of the acetabulum resisted re-position until further downward traction on the leg and further forward pressure on the trochanter, caused the head to slip into the acetabulum. Three or four small vessels were tied and the capsule was sutured with interrupted chromic catgut stitches. The large wound was approximated with buried catgut and superficial sutures of silkworm gut. A large, fenestrated, split rubber tube was placed in the posterior part of the wound for drainage and a long padded board splint was applied to the trunk and leg.

The operation was well borne. There was moderate shock and camphor and strychnia were given for stimulation. The patient reacted well from the operation and from anæsthesia. On the following day his condition was good. There was a slight discharge of sero-sanguinous fluid from the incision. The drainage tube was removed on the sixth day. Sutures were removed on the eighth. The patient had no further pain in the hip and a re-X-ray showed perfect reduction. Extension was maintained for three weeks, reducing the weight gradually. He began to complain of severe pain in the posterior part of the left knee on the twelfth day. This condition was believed to be due to a "splint arthritis." The board splint was removed and a Thomas splint, with an attached leg piece, hooked up to a Balkan frame, was then used to permit exercise of the knee.

The patient was forced out of bed on the forty-first day (it was difficult to secure his coöperation) and massage treatment was instituted. At the present time he is able to be about on crutches. He has some œdema of the leg and foot, which is lessening and the knee motion is slowly improving. There is a slight ulceration of the heel. Hip motion is fairly good.

DR. DEFOREST P. WILLARD remarked that the incision used in this case is one suggested by Dr. M. N. Smith-Petersen, of Boston, and is known by his name. It is used almost routinely in orthopædic surgery for exposure of the hip-joint. It consists of a reversed L-shaped incision beginning at the level of the lower border of the hip-joint, extending upwards along the outer edge of the rectus muscles to the anterior superior spine, then backwards for about four or five inches just below the iliac crest. Tensor fascia femoris and gluteal muscles are resected backwards and downwards sub-periosteally until the acetabular cavity is reached. The capsule can be opened either by incision along the neck of the femur or along the edge of the acetabulum. This incision gives excellent exposure to the hip-joint, and in such a case as that presented by Doctor Jopson, it is the only type through which results could be obtained.

DOCTOR JOPSON added that the result in this case still leaves much to be desired. The man is not young and they hesitated before resorting to the open method, but felt it was justified by his condition as he was hopelessly crippled. It was largely due to the wisdom and assistance of Doctor Willard that the operation was carried through and the reduction obtained. It took the combined efforts of four surgeons to lift the head over the posterior portion of the acetabulum. The exposure was ample. It has been difficult to get the coöperation of this patient and he is very easily discouraged; so much so that at times it has seemed as if we were making progress backward rather than forward. In describing the motion in the joint as fair, it is meant that it was about 20 per cent. He is still in the hospital, and under treatment by massage, etc.

DR. A. P. C. ASHHURST said that a good many years ago he assisted Doctor Harte at the Orthopædic Hospital in operating on a patient of this type. Doctor Harte excised the head of the femur and though this seemed rather radical treatment, the result was extremely satisfactory. The patient was above fifty years of age; he secured free motion, without pain, though of course with limp. The man returned to work and now is living on a ranch; he has been able to ride horseback and do just what he wants to for the last fifteen or eighteen years. Excision of the hip is a comparatively easy operation and it seems to have certain advantages, especially in elderly patients over open reduction of the dislocation, which may give a very prolonged convalescence, and leave the patient with a stiff and painful joint.

PERSISTENT FECAL FISTULA TREATED BY ILEO-CÆCAL RESECTION AND ILEO-COLOSTOMY

DR. JOHN H. JOPSON presented a man, aged forty-six, who was admitted to the Medico-Chirurgical Hospital, February 9, 1925, for study and possible operation for a fecal fistula. Previous to an attack of appendicitis in 1905, he had always been unusually healthy. Since that date he had had thirteen operations, the first two for suppurative appendicitis and the remainder for fecal fistula.

At the time of his original operation for an acute appendicitis, a few days

later his abdomen was reopened to institute drainage. This was followed by an incisional hernia and a fecal fistula. He had several operations during the following years for adhesions. Operation again followed for incisional hernia and fecal fistula. This operation was unsuccessful and he had a two-stage operation performed in Rochester, Minnesota, for the cure of his hernia and fistula. The following year, he had a recurrence of the hernia with strangulation and was again operated, but had a recurrence of his fistula.

Two years later he had a further operation for adhesions, with good results, and his fistula closed for about two years. Three years ago there was a recurrence of the hernia, with strangulation, and he was re-operated. Four days after this operation, the wound broke down, with reformation of the fistula. The wound remained open for seventeen weeks, when an attempt at closure was made. Shortly afterwards, he noticed an opening in the incision, through which gas and fæces escaped. Four months ago, there was a prolapse of the bowel through the fistulous opening and this occurs constantly.

The patient stated that when he was able to keep the bowel in the abdomen, he passed fæces through the rectum, but when the bowel protruded, all of his fæces passed through the fistula. His abdomen was rather obese and showed an operation scar, extending diagonally (about 30°) from the pelvis to the costal margin, spreading to a width of two inches over McBurney's point.

At the widest portion of the scar, there was an opening lined with mucous membrane, about 1 cm. in diameter, through which the bowel prolapsed for about three inches. The length of the prolapsed gut sometimes was considerably greater. Fæces exuded through the opening.

Serial röntgenographic films made of the colon, outlined with barium, at the 15 and 24 hours in succession, revealed no X-ray evidence of fistula extending between any portion of the bowel, with special reference to the pelvic colon, nor into the peritoneal cavity. The cæcum was fairly, freely movable. The fistula was approximately 4 cm. above the cæcal tip. An opaque enema confirmed the above observation. This examination was made to determine whether any short-circuiting or resecting operations had been previously performed.

In a following study, barium was injected immediately through the fistula and, apparently, communication was directly into the cæcum. A plate was made fifteen hours later to determine if the bismuth moved with the normal colon channel, or if it was loculated. Subsequent examination showed that the bismuth was not loculated but was apparently free in the colon.

Under general anæsthesia, the fistula was first dissected free, down to the peritoneum and closed with a suture ligature. The peritoneal cavity was then opened and the fistulous opening, one cm. in diameter, and the bowel which prolapsed through it, was located in the cæcum. About three inches of the terminal ileum was then resected, together with the cæcum and the first part of the ascending colon. A lateral anastomosis between the ileum and ascending colon was made, and the defect in the abdominal wall, including a large incisional hernia, was repaired by layer suture. A cigarette drain was placed in the abdomen, down to the point of anastomosis. One thousand c.c. of normal saline solution were given per hypodermoclysis, during the operation, and camphor and digalen were given for stimulation. The patient reacted well, and his condition was good on the following day.

There was a slight serous discharge from the incision. The drain was removed on the third day. Three days after operation he had a liquid stool containing blood clots and some free blood. The wound healed by first

intention, with the exception of a small opening, through which drainage was established. This area gradually filled in with granulation tissue. His convalescence was uneventful. He was troubled for a few days with a persistent diarrhœa. His wound has solidly healed.

The temptation was great to close the small opening in the cæcum and drop it back without resection, but the cæcum had probably been shortened by repeated suture operations and resection of the atrophied margins of the opening. The necessary inversion would have brought the suture line very close to the ileocæcal junction. The bowel wall was very thin at this point.

For this reason, and in view of the failure of repeated operations of the conservative type at the hands of skilful surgeons, determined the decision to resect the entire cæcal area.

RHINOPLASTY

DR. GEORGE M. DORRANCE presented a young woman to show progress in the construction of a new nose, for which his "peak roof" method had been used. He considered the result satisfactory. The girl has a fairly good-looking nose, through which she can breathe freely.

POST-APPENDECTOMY PYLEPHLEBITIS; WITH LIVER ABSCESS

DR. E. L. ELIASON reported the history of a boy, thirteen years of age, who was operated upon by him at the University Hospital for a ruptured gangrenous appendix. A spreading peritonitis had already developed. Drainage was instituted, and the usual technic for peritonitis inaugurated including an intravenous injection of 5 per cent. solution of gentian violet. The temperature dropped to normal on the third day, but fluctuated during subsequent days. On the ninth day a slight chill was felt. Temperature rose to 102. During the immediately following days evidences were noted of congestion in the right diaphragmatic region.

On the eighteenth day following operation it was noted that rigidity was present in the upper right abdomen. Tenderness to fist percussion over the liver. A very slight œdema was noted in the mid-axillary line extending over the eighth, ninth and tenth ribs. There seemed to be a slight engorgement of the superficial veins in this area. Palpation of the abdomen elicited a thick, irregular, doughy feeling. No fluid could be demonstrated in the flanks. Widal hæmoclastic crisis test indicated a reduction in hepatic function, and an intra-hepatic collection was suspected clinically in the right lobe, although the X-ray revealed a high fixed diaphragm on this side. A needle was introduced in the anterior axillary line between the ninth and tenth ribs. It was directed downward into the liver and pus was withdrawn. Resection of a piece of the ninth rib was performed. The parietal pleura was stitched to the diaphragm around the needle which was left *in situ*. An actual cautery was then passed down along the needle and an opening the size of one's thumb cauterized into the abscess cavity, which contained from two to three ounces of thick yellow pus. The patient's temperature promptly dropped to normal and remained there. A bismuth preparation was injected into the abscess cavity, which X-ray plates revealed to be within the liver. The patient made a subsequently uneventful recovery and left the hospital just one month from the day of admission.

DR. CHARLES F. NASSAU remarked that in cases of death from an appendix case in which secondary liver abscess had formed, it was the rule to find at necropsy, that the septic condition of the liver started with multiple

abscesses, which rarely break down to single abscesses before death. This is obvious to those who have had subphrenic abscess cases which were diagnosed as liver abscesses, the differential diagnosis being extremely difficult. If the abscess is amœbic, the formation of a single abscess is probable.

DR. A. P. C. ASHHURST favored the suggestion of Doctor Nassau that Doctor Eliason's case is one of subphrenic rather than of hepatic abscess. In 1900, Loison, a French surgeon, reported 12 fatal cases, and one recovery, after operation for hepatic abscess following appendicitis; but in the discussion of this report Tuffier said that he thought the facts presented were not sufficient to justify the diagnosis, and that the cases reported were instances of subphrenic abscess. Even before that date, however, Loison pointed out that Körte, in 1892, had recorded a successful operation for an abscess of the liver secondary to appendicitis. Moreover, in 1911, Quénu and Mathieu collected reports of operations on 14 such patients, with only 2 deaths; they said that in these very exceptional cases of operation for this complication of appendicitis, either single abscesses had been present in the right lobe of the liver, or, that multiple abscesses had fused or were readily drained through a single opening. So that it must be admitted that such cases though rare, may occur. But in Doctor Eliason's case the facts he has so far mentioned in his brief verbal report of the operation leave the exact situation of the abscess in doubt.

DOCTOR ELIASON rejoined that this abscess was in the liver. When the chest was opened near the lower end of the pleura, he could see when he opened into the diaphragm that the liver was free underneath it. The abscess was in the liver substance one inch away from the diaphragm; also the X-ray and the use of the bismuth preparation proved this was so. He had had two other cases in the last year that looked like simple single liver abscess, both of which were diagnosed liver abscess, and at operation an abscess in the lower surface of the liver was opened and drained. Unfortunately neither one of these cases was post-mortemed, so they may have had other abscesses as stated by Doctor Nassau.

LENGTHENING THE SOFT PALATE IN OPERATIONS FOR CLEFT PALATE

DR. GEORGE M. DORRANCE read a paper with the above title, for which see page 208.

DIVERTICULA OF THE JEJUNUM

DR. NORMAN P. ROTHSCHILD (by invitation) read a paper with the above title, for which see page 250.