TRANSACTIONS
OF THE
PHILADELPHIA ACADEMY OF SURGERY

Stated Meeting, held October 2, 1916.

The President, DR. CHARLES H. FRAZIER, in the Chair.

FRACTURE OF SKULL, DECOMPRESSION AND DRAINAGE

DR. NATHANIEL GINSBURG presented a youth, aged fifteen years, who was admitted to the Jewish Hospital, September 4, 1916, on account of a cranial injury sustained a half-hour previously. He was in partial stupor, with a rapid pulse which quickly slowed down to sixty beats to the minute while the examination was taking place. There was a large hæmatoma of the scalp to the right of the external occipital protuberance, with a rupture of the soft parts about two centimeters in extent, extending down to the bone. The pupils upon admission were equal, but within a short time, the right pupil became widely dilated, and the inequality remained marked. The skin was cold, and perspiration profuse. Vomiting at first of normal gastric fluid was quickly followed by fluid containing fresh blood, and was projectile in type. The oropharynx showed free bleeding from above. There was ecchymosis of the left upper eyelid, and a small hæmatoma was present over the left frontal region. The left ear was almost totally avulsed from its attachment. The patient had had one convulsive seizure.

He was immediately taken to the operating room, and lumbar puncture revealed intracranial hemorrhage, the fluid being deeply colored by blood. Under ether anæsthesia, the scalp was incised down to the bone, employing a vertical incision over the right occipital area, the incision extending equally above and below the line of the lateral sinus. A fissure fracture of the occipital bone was revealed with free bleeding externally. The skull was quickly opened by drill and rongeur forceps, the gutter in the bone extending to the superior limit of the break. The inferior extent of the fracture apparently passed into the foramen magnum and it was not deemed advisable to remove all the bone down to this point. Free bleeding from the diploic vessels was easily controlled by Horsley's bone wax. The extradural clots were wiped away and the dura was incised above and below the ten-

torium, avoiding the lateral sinus and exposing the cerebral and cerebellar cortices. Blood-tinged cerebrospinal fluid under much pressure escaped, and the dural incisions about two centimeters each in length were not sutured. A small piece of rubber tissue was introduced down to the dura in the lower angle of the wound and the scalp sutured by interrupted iodized catgut and silkworm gut sutures. The drain was removed twenty-four hours later. The wound was dressed with gauze moistened with solution (1–4000) bichloride.

The nasal and oral cavities were sprayed hourly with an antiseptic solution, no packing of the nares being employed.

Except for free vomiting and extreme restlessness and headache during the first twenty-four hours, convalescence was uninterrupted, and the boy left the hospital well on September 17, thirteen days after the injury.

The important features of this case are prompt operation with drainage above and below the tentorium cerebelli, by dural incisions, frequent washing of the pharynx, and final recovery.

Dr. Ginsburg said that he resorted to immediate decompression with drainage above and below the tentorium cerebelli in this case, because he regarded the presence of free blood in the cerebrospinal fluid as evidence of intradural hemorrhage. The symptoms of cerebral compression were indisputable, and prompt relief of intracranial pressure would give the best chance of recovery.

Although he could not say that this patient would not have recovered without the prompt occipital decompression and the drainage which was thereby established, it was true that at the operation, the bloody cerebrospinal fluid, which escaped when the dura was incised over the cerebral and cerebellar cortices, was under great pressure, and rapid recovery ensued following decompression.

FEMORAL ARTERIOVENOUS ANEURISM

Dr. Edward B. Hodge presented a man, twenty-three years of age, who was admitted to the Presbyterian Hospital, April 3, 1916, with an egg-sized pulsating swelling in the right thigh, with a history that three months before admission, in a machinery accident, a piece of steel about an inch in length, had been driven into the inner anterior surface of his right thigh. Two days later, he noticed a non-painful swelling, egg size, near the site of injury. This had varied in size, but was now larger than at first. In the last three weeks, there had been a peculiar sore feeling on the inner part of the lower leg. The general examination was negative. About seven inches below Poupart's liga-

ment and in line with the femoral vessels, was an egg-sized pulsating swelling. A plain thrill was felt here and also over the femoral vessels as high as Poupart's ligament and for three inches below the tumor. There was a loud continuous bruit heard over the mass accentuated with the beat of the artery. This was also heard from Poupart's ligament as far down as the popliteal space. There was no tenderness nor pain nor was there tenderness over the "sore" area in the lower leg. Proximal pressure obliterated the thrill, while distal pressure had no effect. There was a good pulsation in both tibials.

Operation (April 7).—Under gas-ether. Tourniquet applied high upon thigh. On incising the soft parts, there was found much inflammatory reaction, matting the tissues together over and about the sac. The latter was located at the beginning of Hunter's canal. After considerable difficulty from the infiltration of the muscles and from oozing, the mass was cleared into healthy tissue above and below. Temporary tape ligatures were placed on both sides of the sac. The vessels were found tightly adherent for about two inches. The foreign body was felt posterior to them and was removed. It was found impossible to close the communication between vein and artery without opening the sac, as had been done in a previous case. The sac was incised and the vein found lying in front and to the inner side of the artery with a communication between the two about three-quarters of an inch long. There was considerable bleeding which could be checked by the provisional tape ligatures. An attempt was made to suture the communication from within the sac, but the tissues were so friable that the suture would not hold. After many attempts, this plan was abandoned and quadruple ligation with excision of the involved vessels was done. Hæmostasis was completed after the removal of the tourniquet and wound closed in layer suture. The operation was long, taking over two hours, due to the oozing and the many attempts to suture the opening. Patient had a rapid pulse at its conclusion, but soon reacted and had a normal convalescence, with a temperature of 100.2° for its highest. Two days after operation, the right leg was one and three-quarter inches larger than the left just above the knee. The elevated foot remained warm and of good color at all times, and on the eighth day, pulsation in the tibials was felt. He was discharged cured on the 17th day. The foreign body proved to be a piece of steel, shaped like an arrow head, about one-third of an inch long.

Dr. John H. Gibbon said that the application of a temporary ligature in the case of traumatic aneurism is feasible, but when dealing with an aneurism, the result of a diseased blood-vessel, the employ-

ment of such a ligature is dangerous. The failures and fatalities which have followed the performance of the Matas operation have been largely due to the injury produced at the site of the application of the temporary ligature. The most carefully applied temporary ligature may result in secondary aneurism or rupture of the vessel. He had operated upon a good many cases of aneurism of the popliteal and femoral arteries and in all he had used digital compression with the most satisfactory control of circulation. In one case of iliac aneurism, he first opened the abdomen and had an assistant control the circulation by digital compression. This is a safer and more intelligent method of control than either that obtained by ligature or tourniquet, as no damage can be done to the vessel. In cases such as Dr. Hodge reports, of course, the temporary ligature is less likely to do harm.

DR. J. STEWART RODMAN recalled a case in which he had the privilege of assisting Dr. Horsley, of Richmond, Virginia, operating at the Medico-Chirurgical Hospital.

This case was one of arteriovenous aneurism of the femoral vessels, in which Dr. Horsley, after much difficulty in freeing the vessels from surrounding tissue, performed a similar operation of separating artery and vein and restoring their calibre as reported in a previous case of Dr. Sweet and Dr. Hodge (ANNALS OF SURGERY, 1915, lxi, 367).

The operation lasted for three hours, was very tedious and as the vessels were friable there was considerable bleeding. Temporary ligatures were placed above and below the suture points in both vessels in case secondary hemorrhage should make it necessary to ligate these vessels. The patient had several small secondary hemorrhages which were controlled by packing.

On about the tenth day following the operation a furious secondary hemorrhage occurred making it necessary to ligate both vessels. A few days following the ligation, although the limb seemed warm and the collateral circulation fairly well established, the patient collapsed and died apparently from sudden failure of the circulation. Death probably resulted from embolism.

FRACTURE-DISLOCATION OF HUMERUS; RUPTURE OF AXILLARY ARTERY; GAS BACILLUS INFECTION

DR. JOHN SPEESE reported the following case: Mrs. M. K., aged fifty-six, was admitted to the Polyclinic Hospital, July 12, 1915, suffering from shock and injuries following a fall from a trolley car. On examination, numerous superficial abrasions were found, an extensive swelling over the left shoulder-joint was present, the patient was

unable to move the left arm or hand and absence of the radial pulse on this side was noted. Under nitrous oxide anæsthesia crepitus was elicited, but a dislocation of the humeral head could not be definitely determined because of the extensive swelling. An X-ray taken immediately afterward, showed fracture of the surgical neck and marked displacement of the head of the humerus.

On the following day as there was slight swelling and cyanosis of the hand, and no return of the radial pulse, operative interference was necessary as the axillary artery seemed to be either injured or pressed upon by the dislocated head of the humerus. An incision made in the line of the artery released a large amount of clotted blood, the almost completely detached head of the humerus was excised, and the irregular and jagged projections from the shaft of the humerus were removed. On sponging out some of the clotted blood in the region of the axillary artery, a completely detached portion of the vessel, three centimeters in length was found. The torn vessel contained a thrombus in both ends, from which there was no bleeding. End-to-end suture of the artery was impossible because of the amount of tissue lost and because of the torn and ragged condition of the vessel. The circumflex artery was noted immediately above the proximal end of the torn axillary artery, the thrombus apparently not interfering with its lumen for the vessel was pulsating vigorously and seemed already to have undergone some degree of compensatory dilatation.

On the following day the patient's arm was warm, did not exhibit any evidence of gangrene, although several blebs, in the region of the abrasions sustained at the time of the accident, were present and gave the crackling sensation characteristic of gas bacillus infection. Cultures and smears from the blebs were reported to contain the *bacillus aërogenes capsulatus*. Further attempt to save the patient's arm had to be abandoned on account of this complication, and a high amputation of the shoulder performed twelve hours after the blebs appeared. The flaps were not sutured, the wound was flushed thoroughly with peroxide of hydrogen and gauze soaked in this solution was packed loosely in the wound. The patient exhibited no other symptoms of infection due to the gas-forming bacillus, and the wound healed slowly by granulation.

DR. A. P. C. ASHHURST said that during the past summer he had had a similar case of gas bacillus infection under his care at the Episcopal Hospital. When he came on duty in the wards the patient had been in the hospital for a couple of days with a compound fracture in the upper part of the humerus (railroad crush). Two days later amputation was done for gangrene. In cutting through the deltoid, gas escaped. He put aside the knife he was using and completed

the operation with a second knife. Emphysematous gangrene spread up to the shoulder and partly along the chest; it then stopped and the patient got well. Cultures showed the presence of the *B. aërogenes capsulatus.*

ATLO-AXOID DISEASE

DR. J. T. RUGH read a paper, with the above title, illustrating it with lantern demonstrations.

ENDARTERITIS OBLITERANS

DR. D. L. DESPARD read a paper with the above title.

DR. EDWARD B. HODGE said that he had a patient during the summer who suffered the most distressing pain and was absolutely unrelieved by morphia. The great toe only was affected and the pain was of the spasmodic variety. The Ringer's solution was tried and after the fifth or sixth injection there was improvement, but afterward the condition relapsed and was worse than before. From sixteen to eighteen injections were given, and there was no improvement; neither was there relief from morphia, of which he could take any amount. The man was finally relieved by amputation of the toe.

DR. E. G. ALEXANDER said that it might be of interest to report that one of the cases upon which Dr. Müller did an arteriovenous anastomosis, and which he mentioned among his failures, came later to Dr. Deaver's service at the Episcopal Hospital with a beginning gangrene of the toes of his other foot. He refused to have anything done surgically. He was put to bed with the limb elevated and given potassium iodide internally. He made a good recovery. He stated that this foot had felt exactly as the other prior to his operation at the University Hospital, as his toes were cold and numb.

DR. P. G. SKILLERN, JR., said, with reference to the practice of Dr. Stewart, who had stretched the sciatic nerve in cases of endarteritis obliterans, after the method of Chipault, to be effective the stretching must reach the nerve-trunk in whose trophic area the diseased vessel is situated. It seemed to him that a more intensive reaction in these nerves may be obtained by Réclus's operation of "neurotripsis," or dissociation of the nerve-fibres by a metallic instrument. Comparing the effects of nerve-stretching with those of nerve-laceration (neurotripsis) Smits, who made use of these procedures in the treatment of *maux perforants,* varicose veins and varicose leg ulcers, says that without any doubt nerve-laceration is more efficacious than stretching operations at ordinary distances, since lacerating the sciatic nerve is sufficiently radical to be followed by an action on its most distant

branches, while simple nerve-stretching has by no manner of means such an effect. Not only has neurotripsis an indirect influence upon the sympathetic system, thus increasing the trophic energy of the tissues, but it also frees the axis cylinders from the effects of pressure, which may be due to involvement of the nerve by extension of the cicatricial process from the blood-vessel (popliteal space; leg; varicose veins and cutaneous nerves), or else to disease of the vessels of the nerve itself (*arteria comes nervi ischiadici;* varicosities of veins within sciatic nerve), thus often accomplishing a double purpose, and often relieving nerve-pain at its *fons et origo.* What segment of the sciatic (or anterior crural) nerve is to be subjected to neurotripsis must vary with the individual case.

DR. N. GINSBURG remarked that there is nothing specific in the treatment of endarteritis obliterans of the type termed Buerger's disease. These cases are usually seen when the process is terminal, and all surgical measures are purely palliative in nature. Conservatism, when possible, should be employed in dealing with the devitalized extremities. However, if impending gangrene is present, early amputation will spare the patient much suffering and the danger of mixed infection. He had performed ligation of the femoral vein on five occasions, one of the patients being an old diabetic in coma, and in whom the operation had no value. The other four cases were typical cases of Buerger's disease. In one patient marked relief has occurred, following the loss of the big toe and the adjacent metatarsal bone, the foot has been spared. He was not prepared to state that the progress of the disease in this case was inhibited by the performance of the operation. The other three cases were failures, and one patient died with every evidence pointing to an ascending thrombus, occluding the vena cava and the renal veins. This case was a poor operative risk, and died of suppression of urine.

With regard to intravenous injections of sodium citrate solution, experience is too limited to definitely state what value can be placed upon this form of treatment.

DR. DESPARD, in closing, remarked regarding the salt solution, he did not use it in the cases reported. He had used the method in only one case and that was unsuitable for a fair test, for which reason he did not report it.

In reference to the neuritis, he thought that it is an ascending one. Whether all the pain and distress these patients suffer and the symptoms referable to the nerve are of secondary or primary origin he did not know. We have no evidence at this time from which to draw definite conclusions. There is something more than simply a clot in the vessels.

AUTOGENOUS FASCIAL RECONSTRUCTION OF THE BILE-DUCT

DRS. NATHANIEL GINSBURG and JOHN SPEESE read a paper with the above title.

DR. JOHN H. JOPSON spoke of the first method of anastomosis, the direct suture of the divided ends of the common bile duct, in which there is no loss of substance, in order to place on record a case in which he did this operation with success. The patient was referred by Dr. John H. Musser, Jr., for operation for carcinoma of the pylorus. He had had an old ulcer and the carcinoma was thoroughly engrafted upon it. The gastro-hepatic omentum was extensively infiltrated, there was strong adhesion to the pancreas, and in resecting the stomach he got beyond the line of safety and cut completely across the common bile duct. He immediately clamped it off, completed the partial gastrectomy and did an end-to-end anastomosis of the bile duct with chromic catgut, suturing the union with a mattress stitch of linen anteriorly. The region was drained. There was profuse leakage of bile on the second and third days, which then stopped suddenly, and the man made a good recovery. He was in excellent health thirteen months later.

DR. P. G. SKILLERN, JR., called in question the permanency of the patency of the lumen of the bile duct, for the fundamental reason that the operators failed to provide an epithelial lining to their exotic duct. It is a law in surgical pathology that when the epithelial lining of a soft-tissue tube is destroyed or absent, and does not regenerate, the tube becomes involved in stricture-formation at the site of the missing epithelium. This law applies to the Eustachian tube, the œsophagus, the stomach (hour-glass stomach), the intestines (especially the rectum), the bile duct, the ducts of salivary glands (including the pancreas), the Fallopian tube, the ureter, and urethra. Taking the urethra, for example, the first stage of stricture-formation is destruction with permanent loss of epithelium followed by the formation of a granular patch and ultimately the inevitable cicatricial constriction; and no plastic operation for the permanent restoration of a patent lumen succeeds unless the exotic tissue transplant bears with it an epithelial lining. Another illustration is afforded by the behavior of intestinal fistulæ. Nothing closes so surely and rapidly as the large intestine fistula (cæcum) when not lined by epithelium; nothing is so sure to persist forever as a similar fistula when lined by epithelium from bowel to skin. Witness the persistency of branchiogenic fistulæ! Commenting upon Sullivan's method of reconstruction of the bile-ducts by

union by rubber tube of common or hepatic duct to duodenum, W. J. Mayo says, " This is by all means the simplest method of restoring the bile-channel, but unfortunately the newly-formed channel is not mucosa-lined, and we must expect that eventually contraction will take place . . . ." This is one reason why Walton's method of reconstruction, which was referred to by the essayists, appealed to him, for restoration is made by a pedicled duodenal flap. The second reason why he preferred Walton's method is based upon what seems to him to be irrefutable logic, namely, the pedicled duodenal flap is lined by mother epithelium from which the anlage of the hepatic bud is derived, so that by this method the place of the missing common duct is taken by homologous tissue lined by homologous epithelium, and provided epithelial edge of the graft has been accurately contacted with epithelial edge of duct-stump, with this proviso the chance of stricture-formation should be practically nil. Whether or not, in the plastic of the essay-ists, epithelial regeneration will spread from the duct-stump along the exotic fascia duct to the duodenum is problematic; if so, the situation would be saved; if not, the inevitable constriction which forms the basis of Mayo's argument against Sullivan's method will occur. In any event the interesting problem offers first-class opportunities for experimental investigation.

Dr. Ginsburg replied, with reference to Dr. Skillern's contention that fascial reconstruction of the bile duct might be followed by sub-sequent stenosis, owing to the fact that the newly-established biliary tract is not lined by epithelium, that it must be borne in mind that the fistulous tracts most difficult to close are those which do not have an epithelial surface. We all know that perineal fistula, abdominal fecal fistula, and fistulous tracts about joints will persist indefinitely as long as there is the pressure of fluid for drainage. What they aimed to create, by the use of an autogenous fascial transplant, is a closed biliary fistula bridging over the gap in the bile duct as the result of injury or disease.

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