STATED MEETING, HELD DECEMBER 2, 1907.

The President, JOHN B. ROBERTS, M.D., in the Chair.

MELANOTIC SARCOMA OF THE SHOULDER.

DR. JOHN H. GIBBON exhibited a case of melanotic sarcoma of the shoulder and showed photographs of the patient before operation. The patient was a child of eight years of age, upon whom Dr. Gibbon operated last March. She had a large melanotic growth involving the skin over the shoulder and back. There was also a metastasis to the axillary glands. Numerous melanotic spots were observed in the skin all over the body and face. The growth was removed, together with the gland. Several skin grafting operations were subsequently performed. The wound is now all healed excepting an area about the size of a dime. The child has put on weight, and looks and seems perfectly well. There has been an increase, however, in the number of black spots in the skin. The clinical diagnosis was melanotic sarcoma and this was confirmed with the microscope.

FALSE ANEURISM OF THE FEMORAL ARTERY.

DR. GIBBON also exhibited a man with a large swelling in the lower third of the thigh; this man had been shot through the thigh twenty years previous. From the history it seemed that he had developed some years later an aneurysm in the neighborhood of Hunter's canal. Last February the swelling became much larger and has recently gradually increased, until it reached its present proportions. A bruit can be heard over the inner aspect of the tumor, but nothing can be heard over the outer portion of it. It extends across the posterior and two lateral aspects of the lower portion of the thigh. The veins over it are very much dilated. There was a question whether this was a pulsating sarcoma, or whether it was a ruptured aneurysm. Dr. Gibbon was inclined to think it was the latter condition.

(The patient has since been operated upon and a large false aneurysm due to gunshot injury of the vessel was found. A

Matas operation was done and several portions of the bullet and spicules of bone were found embedded in the vessel wall. The patient is making a good recovery.)

DR. J. CHALMERS DA COSTA stated that on examining this patient he had thought the condition was an aneurism, the result of injury in Hunter's canal, and that its situation had made the development slow. The fact which particularly attracted his attention was the sudden increase in size of the swelling, which the patient stated had occurred in a single sight. Since then the swelling has progressed slowly.

DR. OSCAR H. ALLIS said that he had had a case somewhat similar to the one exhibited, at the Presbyterian Hospital, and that the bruit was so distinct in the popliteal space that everyone who examined the case regarded it as one of aneurism, but it was shown to Dr. Samuel W. Gross and he immediately said it was not an aneurism, and it was later proved that it was sarcoma.

ENCHONDROMA OF CLAVICLE.

DR. GIBBON also exhibited a specimen of enchondroma of the clavicle. This growth, which was larger than two fists, was attached along the outer one-third of the posterior border. The tumor had grown down underneath the clavicle and underneath the scapula, it also filled the supraspinous fossa and covered the spine of the scapula and came forward over the clavicle. Because of its slow growth it was supposed to be an osteoma or enchondroma, but it was feared that a sarcomatous change might have taken place. The patient was an adult aged 49. The clavicle and scapula constricted the tumor in its centre, giving it the appearance of an hourglass and rendering its removal very difficult.

GUNSHOT WOUND OF BRAIN.

DR. J. CHALMERS DA COSTA reported a case of gunshot wound of the brain. The patient was 50 years of age. Six months before Dr. Da Costa first saw him he had attempted suicide by shooting himself in the head. The weapon was a revolver the calibre of which was No. 22. He shot himself back of the right ear and the bullet did not emerge. He is said to have been unconscious for hours after the infliction of the injury. He gradually recovered from the coma but was found to have

almost complete amnesia. He remembered his name and had some hazy knowledge of his life before he shot himself, but had no knowledge whatever of recent events and no memory of the suicidal attempt. Shortly after the accident he developed epileptiform attacks in each of which there was complete unconsciousness for a brief period and irregular generalized muscular spasm. The epileptiform attacks were occasional and irregular. On entering the hospital it was found that there were no distinct sensory phenomena, that the eye grounds were normal, and that the epileptiform seizures did not have a local beginning. Amnesia was complete as to all events subsequent to the injury and to most events before it. The registration element of memory was completely destroyed and the reproductive element was sadly impaired. Dr. Manges, by the X-rays, located the bullet beneath the parietal eminence of the left side. The patient was showed to the clinic as a case in which a bullet had crossed the brain and lodged beneath the cortex of the side opposite to the entry. A diagnosis of subcortical left-sided lesion was made. That very afternoon he developed status epilepticus of great violence. His life was thought to be in imminent peril and he was trephined over the supposed point of low gunshot. The dura was normal and when it was opened the cortex appeared normal. The cortex was incised and at a depth of one-fourth of an inch a cavity was entered. The cavity contained some partly clotted blood and some fragments of brain substance adherent to fibrous tissue and to the bullet. The bullet was removed. It was partly flattened and had a bit of fibrous tissue and some brain substance firmly adherent to it. It seemed that the projectile had been encysted but had been detached from its encompassing wall. A piece of gauze was inserted, the dura was sutured and the wound was closed.

For some days he was very delirious but he gradually recovered and now is vastly better. At this period (2 months after operation) his memory has notably improved and he remembers well all events antecedent to his suicidal attempt. Registration is again taking place and he remembers things from day to day, but has no memory whatever of the time between the shooting and the time at which he became fairly normal after the operation. Dr. Da Costa had hoped to have had him here at the meeting but his family had failed to bring him. The bullet was found in the exact position and at the exact depth indicated by Dr. Manges.

GUNSHOT WOUND OF THE SPINAL CORD.

Dr. Da Costa also reported a case of gunshot wound of the dural spine. This man had been shot by accident some weeks before. He had had a laminectomy performed upon him but the bullet was not found. On admission to the hospital it was found that he had the symptoms of a complete transverse lesion at the level of the third dural vertebra. Dr. Manges located the bullet with the X-rays. He developed a fever, due it was thought to cystitis. He died in a few days. The necropsy showed the bullet in the interior of the spinal cord. The cord was virtually destroyed at this level and the bullet could not be seen where the dura was opened. It could only be seen when the cord was incised. Dr. Da Costa exhibited the specimen and stated that it was no wonder that the bullet was not discovered by the surgeon who performed laminectomy.

LOCALIZATION OF FOREIGN BODIES IN SKULL AND SPINAL COLUMN.

Dr. W. F. Manges spoke as follows:

The apparatus, used to determine the location of the bullet in each of the two cases reported by Dr. Da Costa, is a modification of the Mackenzie Davidson cross thread localizer. It was devised by the Roentgen Mfg. Co. of Philadelphia, and is a detachable part of the tube carriage of their radiographic table.

All parts of the tube carriage are accurately graduated, and to the base of the tube holder are attached two spirit levels, so that it is possible to manipulate the X-ray tube in a definite and most precise manner.

The localizer has four adjustable rods, three of which are used to bring the localizer in a definite relation to the patient, and the fourth, to point to the exact location of the foreign body in relation to the localizer. There is a cross bar deeply notched at intervals corresponding to graduations on the cross bar of the tube carriage.

A clamp to hold the sensitive plate in relation to the tube carriage is attached to the edge of the table, and a shadowgraph of this clamp makes it possible to bring the developed plate back to the position it occupied at the time of exposure.

The relations, then, between the X-ray tube, the localizer, the patient, and the sensitive plate, are definite and can be manipu-

lated with mechanical accuracy at will, and regained with equal precision after the exposures are made.

The technique of localization by this method is briefly this: The position of the bullet, or, other foreign body, is first approximately determined by means of the fluoroscope, or by making a skiagraph or two.

A sensitive plate is then put on the table and held by the clamp above mentioned. The patient is placed on the table so that the region containing the foreign body will be in the field of radiation, and that the desirable field of surgical operation will be directed towards the X-ray tube.

The localizer is then attached to the tube carriage; the carriage brought to position, and lowered so that the localizer approaches near the skin surface; the three adjustable pointers are made to touch the surface of the body at convenient spots, and in this position they are firmly fixed; these spots are made indelible with silver nitrate; all readings of the tube carriage and the spirit level are carefully noted. The localizer is then removed; the focus point of the X-ray tube (the source of light) is brought to a position which exactly corresponds to the position of one of the deep notches on the cross bar of the localizer, when it was in position; an exposure of but few seconds is made; the focus point of the tube is then made to correspond with the other deep notch on the cross bar of the localizer, and a second short exposure is made on the same sensitive plate.

The patient is removed, and the plate is developed. On the plate are then found two images, or shadows, of the foreign body and shadows of the two arms of the clamp which held the plate. When the plate has become thoroughly dry a piece of thin white paper is pasted as its corners to the film on the plate, and tracings of the several shadows are made. The plate with the tracings attached is then placed on the radiographic table in its original position with relation to the tube carriage and localizer; the tube carriage and localizer are also made to occupy their original position, so that the two deep notches on the cross bar of the localizer assume the exact positions of the focus point of the X-ray tube at the time of exposure. A thread with a weight attached to one end is passed through one deep notch, and the weight end placed on the centre of the shadow made with the tube in that position, and a second similar thread is directed from the other notch to its

corresponding shadow of the bullet. The point at which the threads cross is the location of the bullet in its relation to the localizer.

The fourth adjustable rod of the localizer is then placed in position so that its point touches the crossing of the threads, in which position it is fixed, except in the direction of its long axis and superficial to the location of the cross threads. At the time of operation for removal the localizer is sterilized, and the radiographer observes the rules of surgical cleanliness so that he may adjust the localizer to the patient.

The three fixed points of the localizer are placed on their respective marks on the patient, and then the fourth rod will point in the exact direction of the bullet and at the same time give the exact depth from that point of the surface which it touches.

If necessary, at intervals during the operation the localizer may be reapplied to determine the depth of the wound and bullet.

Dr. Manges claimed no part in the designing of the apparatus except the valuable addition of the spirit levels to the tube carriage, but he believed that the idea of sterilizing the apparatus and taking it to the operating table originated in the X-ray department of Jefferson Hospital, and that it was first put into practice in one of Dr. Da Costa's clinics during the winter of 1906–7. They had had its efficiency tested in five cases, in all of which the results have been most satisfactory, one of the cases having been determined on the postmortem table.

NAILING A RECENT INTRACAPSULAR FRACTURE OF THE FEMUR.

Dr. G. G. Davis said that a couple of years ago he showed a case before the Academy in which he had fastened the fragments together with a steel screw, which was allowed to remain in for approximately four weeks. He considers it an interesting question as to whether or not to operate in cases of recent fracture. He believes that the case he refers to was the first to be reported, and he advocated that method of procedure, that is, operative treatment in a recent intracapsular fracture. He considers the question as to the propriety of operative interference now lies in our estimate of the value of conservative measures. There are two ways of treating intracapsular fractures which have proven very successful; one, in which there is longitudinal traction together with lateral traction; the other is in the position of

forced abduction. The question hinges upon the desirability of introducing foreign bodies into these bones on account of the danger of sepsis. He said that Dr. Da Costa would recall a case which he had him see several years ago, where there were beautiful symptoms of active sepsis, evidently caused by steel pins driven into an old ununited fracture, and since then Dr. Davis has had other cases in which it has been desirable to remove the pins. In one case where he tried using ivory pins, these pins broke and therefore in some of his recent cases, instead of using pins or screws to fix the fragments he has resorted to placing the limb in very marked abduction in plaster-of-Paris. Most of his cases have been those of ununited intracapsular fracture, but the union has been so prompt that he is growing sceptical regarding the necessity of using pins or other means of fixation by foreign bodies in these cases of intracapsular fracture. In justice, however, he states that he has seen one case in which this method of abduction was tried in a recent fracture but union did not occur.

Dr. H. Augustus Wilson said with regard to the disadvantage of driving the spike through the head of the acetabulum, that he considered that this was a proper mechanical procedure, for if the point of the spike went simply into the head it would have little opportunity of holding the head of the femur at the point of fracture. In one of his own cases he also drove the nail through the head into the acetabulum, and yet in two years' time there was perfect bony union; there was some restraint, however, to rotation, abduction and adduction, in which positions the point of the spike in the cavity in the acetabulum prevented these functions. Flexion was unimpaired. It seemed as though there were strong indications for the removal of the nail, but the patient was so well satisfied with the firm union that she declined to have the nail removed. The kind of nail used is of great interest. Nicolaysen drove in a steel nail, making no skin incision and without anesthesia, driving the nail into position through the skin, leaving the head outside. In 21 cases he removed the nail in three weeks' time and he states that in every case the nail was found loose. Since that time large numbers of various materials have been used and in all cases where steel nails have been used the nails have had to be withdrawn. Being impressed with the

fact that the nails were always found loose Dr. Wilson resorted to a method of barbing the nails; he has coin silver nails prepared in such a way as to make their entrance easy and their removal difficult. In one case this was found of decided advantage in that it held the nail fixedly in position and an X-ray taken two years after the insertion of the nail showed it in the original position. This method also got rid of the objection of drilling beforehand.

With regard to the old idea that old ununited fractures must have the edges freshened before they will unite, Dr. Wilson stated that in the January, 1908, number of the *American Journal of Orthopedic Surgery* he will make a report based upon the 35 cases on record. Comparatively few had the edges freshened, yet union almost invariably occurred. He believes that Dr. Da Costa is the first to resort to nailing a recent intracapsular fracture, as in all other cases reported considerable time had elapsed between the time of injury and that of operation.

Dr. Robert G. Le Conte wanted to know what practical value the nail could have if, as stated, it became loose a few weeks after its introduction. He thought its use might in a way explain the treatment of Bier for delayed union, viz.: that it produces enough irritation and exudation of blood around the fracture as to be the cause of the union, and that the success of the operation depends on this, and not the fixation of the fragments by the nail.

Dr. Oscar H. Allis said that the loosening of the nails was due to a certain inflammatory process by which they are absorbed, and that a nail as well as a screw acts as a foreign body. He believes that he was the first to put in an ordinary carpenter's screw in a fracture, and with only one exception has he ever had to search for the screw. After leaving it in for about six weeks it is almost ready to be picked out with the finger. In one case of fracture of the femur between the junction of the middle and upper third he turned the patient on the belly and cut right down on the posterior aspect of the thigh, and in that way he had absolutely perfect drainage. In this case, when he was ready to take out the screw, he found the wound entirely closed, and he believes that if the patient is still living she still carries the screw with her. Dr. Allis believes that in some instances the nail or screw acts as a dentist's plug in a tooth.

Dr. Allis stated that the cancellous structure of the head

of the bone is very much firmer and closer than in other parts. He believes oftentimes the good done by the nail or screw is in the presence of a foreign body.

RECONSTRUCTIVE ENDO-ANEURYSMORRHAPHY.

Dr. Francis T. Stewart reported the case of I. C., colored, laborer, aged 36, who was admitted to the Pennsylvania Hospital June 1, 1907, in the service of Dr. Le Conte, who assisted in the operation. Nine years ago he acquired syphilis, but otherwise has been in good health. About four months before admission he developed a painful swelling in the right popliteal space. He had received no injury, but just before this time, he had slept, on one occasion, with the affected leg hanging over the edge of his bed. Examination revealed a swelling about 4 inches long and 2 inches wide in the right popliteal space, giving all the intrinsic signs of an aneurysm. The knee was slightly flexed, the tibial vessels pulseless, and the leg free from swelling but the seat of severe pain. General examination revealed nothing abnormal except slight atheroma of the arteries. After exsanguinating the limb and applying an Esmarch band the swelling was exposed by a longitudinal incision; the internal popliteal nerve, which was stretched over the sac, drawn to one side; and the sac opened. The aneurysm contained a large quantity of clot, which was soft and black in the middle, and white, tough and cribriform on the walls. The aneurysm had grown at the expense of the postero-internal wall of the artery, and the antero-external half being represented by a groove two inches long. A catheter was placed in this groove and the walls of the aneurysm approximated above it with catgut sutures, the catheter being removed before the last stitches were tied. One small collateral opening in the sac also was sutured. The sac was then obliterated by approximating its walls as described by Matas and the skin sutured without drainage. Immediately after the operation feeble pulsation could be felt in both tibial vessels, which became stronger with the lapse of time. There was no bleeding during or after the operation. The leg was dressed on the twelfth day, the stitches removed, and healing found to be complete. The patient could extend and use his limb as freely as before the development of the aneurysm, but complained of the same severe

pain as before the operation. Some weeks after leaving the hospital he returned with a lacerated hand. Because of the pain a splint had been applied to the leg at another hospital and this had caused ulceration near the heel; otherwise the leg was in the same condition as at the time of discharge.

That the Matas obliterative operation is superior to all other forms of treatment in cases in which it is applicable seems, at least in this country, to be generally admitted. The only possible disadvantage, as compared with extirpation, of which we can think is that in cases in which the nerves are encompassed by inflammatory tissue or incorporated in the sac wall, the motor, sensory, or trophic symptoms may not be relieved. There is doubt, however, in the minds of many surgeons as to the advisability of the reconstructive operation. Excluding secondary hemorrhage, which in the absence of sepsis need not be feared, there are two reasons for this, viz., thrombosis at the seat of operation and recurrence of the aneurysm. Occlusion of the newly made vessel by thrombosis has probably followed most of the reconstructive operations. In our case the pulse in the leg reappeared immediately after the operation and persisted. It is possible that, although the first pulsations in the tibial vessels were due to blood flowing through the repaired artery, this soon became occluded, and that the pulse persisted because of the development of a collateral circulation, aided by the removal of the pressure of the aneurysm from some of the collateral vessels. With, however, the application of the principles of modern vessel suture, *i.e.*, fine needles, fine threads, close sutures, and the minimum of trauma, thrombotic occlusion should be less frequent. If it does occur, it may do so slowly enough to allow an efficient collateral circulation to form, but even though it occurs immediately, the same result would be obtained as in obliterative endoaneurysmorrhaphy. Recurrence of the aneurysm is the strongest objection to the reconstructive operation, as it has occurred twice in 16 cases. These figures do not include arteriorrhaphy for recent aneurysms following wounds of healthy arteries, in which there is no question as to the best treatment. They do, however, include the Matas restorative operations, as there is no essential difference between these and those of the reconstructive variety, except the size of the opening and consequently the number of sutures applied. As Binnie has pointed out, the aneurysm which

Matas calls fusiform is in reality a sacculated aneurysm whose mouth has extended for some distance along one side of the artery. No doubt with improved technic and larger statistics recurrence will be less frequent. A recurrence of course leaves the patient no worse than he was before and may be dealt with by any of the methods applicable to a primary aneurysm. As gangrene is inevitable in a certain proportion of all operations interrupting the circulation in the main artery of a limb, we believe that, despite the possibility of recurrence, the reconstructive operation should be encouraged.

DR. J. CHALMERS DA COSTA said that he had never done the reconstructive operation for aneurysm, but that he had done the obliterative, and in his case had found it impossible to use very fine needles. In this case there was a thick, tense sac and large needles had to be used. He obliterated the sac but could not completely close it, and had to pack gauze down upon it, and the result was a large cicatricial mass in the popliteal space which caused partial flexion of the leg. A number of months passed before it was possible to get the leg straight again. He believes the old Hunterian ligation still has a place.

RUPTURE OF THE LUNG WITHOUT COSTAL INJURY.

WITH THE REPORT OF A CASE.

BY ROBERT G. LE CONTE, M.D.,

OF PHILADELPHIA, PA.,

Surgeon to the Pennsylvania and the Children's Hospitals.

CASE.—James McG., aged eleven, white, was admitted to the Children's Hospital January 10, 1906, at 11.30 P.M. He had been run over by a rubber-tired brougham, the wheel apparently having passed over the the lower thorax. On admission the patient was cyanotic, with labored and rapid breathing; pulse rapid and irregular. He was unable to lie down on account of pain in the left side of the chest and difficulty in breathing. There was a slight lacerated wound over the left eye produced by the horse's hoof. The pupils were dilated and equal.

Thorax.—There was better expansion of the right side of the chest than of the left. Percussion note was normal throughout the right side, although the liver seemed depressed. There was dulness over the cardiac area. Over the left lung there was a tympanitic, hollow, drum-like note; fremitus was absent. Breath sounds were distant and breezy on both in- and expiration. The heart sounds were distant.

Abdomen.—Soft, but on percussion duller than normal; no tenderness. No movable dulness in the flanks. Urine was freely voided and contained no blood. There was a large normal movement shortly after admission.

There was no injury to the spine nor could a broken rib be demonstrated. The boy was conscious but very restless. I saw him five hours after the accident when the restlessness was perhaps not so marked owing to his having had bromides.

Examination of the chest at this time revealed the same physical signs as noted above, except that the entire cardiac area was tympanitic, apparently continuous with the stomach tympany below. The heart sounds were very distant. The pulse was still rapid and irregular; the abdomen was dull and the note in the flanks not clear. It was feared that abdominal hemorrhage was

taking place from injury to one of the solid viscera and the tympanitic note over the cardiac area, which seemed continuous with the stomach note, suggested a rupture of the diaphragm, with hernia of the stomach into the pleural cavity. Nausea was complained of but there was no vomiting.

The boy was etherized and an incision was made to the left of the median line in the epigastrium. The abdominal contents were found entirely normal. There was no rupture of the diaphragm and no hemorrhage. A slender needle was passed into the left pleural cavity and air withdrawn with a syringe. The diagnosis was then revised to rupture of the lung alone. The ether was well taken and both pulse and respiration improved under it.

At 7 P.M. the boy was resting quietly upon his back, the breathing much easier, though shallow, the pulse had improved and he complained of no pain. The following day it was noted that the heart dulness had moved to the right of the median line and the sounds were best heard at the xyphoid cartilage. There was apparently no increase in the pneumothorax, nor was any emphysema present. The patient was much more comfortable and respiration was less difficult. From then on convalescence was uneventful and the boy was discharged February 15th with the physical signs of a slight pneumothorax still persisting.

The patient was seen again November 26, 1907, when the only evidence of previous injury to the chest was a slight impairment of resonance over the lower border of the left lung, most noticeable in the axillary line.

In rupture of the lung the physical signs will depend, to a large extent, upon the degree and the situation of the injury produced in the lung. First. The contusion may be so slight as to produce only a rupture of a few capillaries and vesicles, with extravasation of very minute quantities of blood through the lung tissue. The diagnosis of such a condition by physical signs would be impossible, and unless infection took place later, with the production of a broncho-pneumonia, it would pass unrecognized. Second. There may be rupture of the lung substance without pleural injury. Then there would be no pneumothorax, and if air entered the loose areolar tissue from a

broken bronchiole it would dissect its way to the root of the lung, traverse the mediastinum and show itself at the root of the neck as a crepitant tumor. Third. In rupture of the lung with laceration of the visceral pleura, pneumothorax would probably be the immediate and prominent symptom. Fourth. When laceration is so extensive that a portion of the lung is almost severed from the rest, hemorrhage will be a prominent symptom in addition to the pneumothorax.

These various lesions of the lung may be produced in five different ways: 1. Bruising, where the force is not sufficient or not sufficiently concentrated to cause more than a slight subpleural ecchymosis.

2. Bursting, where the force is of such intensity that the lung cannot empty itself of air with sufficient rapidity. It has been likened to a paper bag inflated with air which receives a sharp blow. Whether it is necessary at the time of injury that the glottis should be closed to produce this result is a mooted point. Perhaps in some cases it is closed, for in times of sudden fear it is very common for an individual to take a short, quick inspiration and hold his breath. Yet it is easy to believe that if the force is sudden and violent the lung would not have time to empty itself of a sufficient amount of air even though the glottis were open.

3. Penetration from a green-stick fracture of a rib, where after the force has expended itself the rib returns to its normal position. Such fractures frequently cannot be diagnosed either by palpation or by the X-ray.

4. Compression of the lung against some more resistant tissue, as the pericardium, producing an injury resembling the wound of a dull, blunt instrument.

5. Tearing, where the lung has previously been glued to the chest wall by adhesions.

The condition of a lung in a cadaver and during life is so different that these injuries cannot be experimentally produced on the dead. In a dead body there is no rapidly circulating blood, and the results of a traumatism in a lung full of blood and air would not be the same as in an empty one, the

resistance to injury being different and perhaps lessened in the living lung.

Symptoms.—1. Shock. Shock is always present, and its degree seems to be proportionate to the amount of injury in the lung, and to the temporary derangement of the nerves which control the heart action.

2. Dyspnœa is always present and its degree will depend to a large extent upon the compression of the lung from the pneumothorax and to the derangement of the heart action. The more rapidly the pneumothorax forms the greater will be the dyspnœa.

3. The heart action will be interfered with owing to the traumatism of its nervous mechanism, the pneumothorax and the increasing resistance to the blood current from a collapsing lung. The pulse is therefore rapid and often irregular, and the aeration of the blood having been interfered with there will be cyanosis of the skin.

4. Cough will always be present, in part due to the compression of the lung, in part to the irritation of the injury itself. It may be short and hacking, without expectoration, or there will be hæmoptysis when the extravasated blood finds its way into an open bronchus.

5. The symptoms of pneumo- and hæmothorax will depend upon the lacerated visceral pleura communicating with an open air passage and upon the size of the vessels which are torn. With pneumothorax there may be absence of heart dulness at first, followed later by displacement of the heart. Hæmothorax will show movable dulness.

6. Emphysema. Emphysema may appear in two different localities. If it appears first in the region of the injury it would be conclusive proof that there had been a fractured rib, for it would show a laceration of the parietal pleura as well as of the visceral, with the escape of air through this avenue to the subcutaneous tissues. If it shows itself at the root of the neck as a crepitant tumor the air dissects its way in the loose areolar tissue surrounding a bronchus into the mediastinum and from there to the neck. From either of these positions it may spread over the entire body producing an annoying complication.

Diagnosis.—In the majority of cases the diagnosis of a ruptured lung is not difficult; the physical signs present will clearly indicate the injury. There is one condition, however, in which an error in diagnosis may easily be made, viz., rupture of the diaphragm with displacement of the stomach or large intestine into the pleural cavity. In this condition there would be the same shock, dyspnœa and cyanosis, with rapid heart action, as would be present in rupture of the lung. The tympanitic note of the hollow bowel could hardly be differentiated from a pneumothorax, and metallic tinkling, two coin test, etc., might also be present. There would probably be a dry, hacking cough on account of compression of the lung. The tympanitic note, however, should not extend to the apex of the pleura as the lung would be crowded upward, and there should be breath sounds at the apex as well as over the root of the lung. Nausea and vomiting should be prominent symptoms in rupture of the diaphragm on account of the compression, perhaps strangulation, of the gut, and as the case progressed these symptoms would become more and more marked. In rupture of the lung nausea and vomiting, when present, appear soon after the accident and do not continue after the stomach is emptied. In both rupture of the diaphragm and of the lung there may be displacement of the heart to the right side, and in both in the beginning there may be entire absence of heart dulness.

The two main differences then would be the prominence of vomiting in rupture of the diaphragm and the fact that the tympanitic note would not be universal over the pleural cavity. However, if the lung is partially glued to the chest wall from a previous attack of pleurisy, we may have breath sounds present over certain areas, with vocal fremitus and resonance, even when the lung has ruptured and a portion of the pleural cavity is filled with air.

I have never been able to place a just estimate upon the value of auscultatory percussion. In the case just reported

this method of examination gave to my ear a tympanitic note continuous with that of the stomach, and I therefore made the error of diagnosing a rupture of the diaphragm. I have seen several acute observers make a similar error in diagnosing intestinal perforation where the abdomen was distended and tympanitic, relying upon the clear transmission of sound from a distance as proof positive of the presence of air in the peritoneal cavity.

Treatment.—For the most part the treatment is symptomatic. Absolute rest in such position as is most comfortable to the patient, whether it be prone in bed or semi-recumbent; stimulation of the heart and sedatives for the nervous system. As a rule opium should not be given on account of its slowing effect upon the respiration. When respiration is very difficult from the pneumothorax pressure, aspiration of the pleura will usually give great relief and may be repeated from time to time. This should be done with a rather slender needle, as any amount of air may be drawn out through a small opening. If a needle of large calibre is used there will be danger of producing emphysema on its withdrawal. Strapping of the chest has been recommended for the control of the pneumothorax, but I cannot understand why it should do any good. It can only slightly decrease the capacity of the chest and it can in no way control or overcome the pressure exerted within the chest from the escaped air. The size of the pleural cavity is of no consequence; it is the pressure within which needs to be relieved. Strapping can do no good and it may impair the expansion of the uninjured lung.

If aspiration of the air from the pleural cavity is not giving the relief desired, for it will not be sufficient in cases where a fairly large bronchus has been opened, an incision between the ribs may be made or a portion of a rib excised and a drainage tube introduced. This will also permit the removal of blood from the pleural cavity and will tend to control the bleeding from the lung. Should the hemorrhage still persist after opening the pleura, a resection of one or more ribs will be necessary, with ligation, suture, or packing of the bleeding

area. When the blood which is retained in the pleural cavity becomes infected through an open bronchus, the treatment will be the same as in ordinary empyema, *viz.*, drainage.

The three principal complications or sequelæ of this injury are broncho-pneumonia, empyema and gangrene or abscess of the lung. The mortality for this injury is somewhere in the neighborhood of 75 per cent.

Dr. Oscar H. Allis considered that the mechanism of the lung might be explained as in the mechanism of a lacerated intestine; such laceration depends on the condition of the intestine at the time of injury, whether full or not, and if laceration occurs it will be at the point where the mesentery is shortest. With regard to the lung, this organ is never seen at postmortem in its normal condition; it is heavier under ordinary circumstances than at postmortem. Hence, it seems there might be enough weight to tear it entirely away. Dr. Allis considers this adds another argument with regard to the mechanism of that lesion.

Dr. Astley P. C. Ashhurst said that it might be of interest to know that about one-sixth of the cases of rupture of the lung without injury of the thoracic parietes have been reported by Philadelphians. In 1871 (Trans. Path. Soc., Phila.) his father had collected 20 such cases, 14 of which are not included among the 20 instances of this injury recently analyzed by Schwartz and Dreyfus [Revue de Chir., 1907]. If these tables be combined, and there be added to them the cases reported by Le Conte, and by Stewart, as well as a second case reported in 1894 by Prof. Ashhurst, there would be 47 cases in all, 33 of the patients recovering. Dr. Ashhurst does not believe the mortality rate has been altered in recent cases, as practically no changes have been introduced in the treatment. He said that there had been a number of cases of traumatic rupture of the diaphragm reported, where laparotomy was done, but that in these cases the mortality rate was high. Mortality after a thoracotomy, however, he states is very much less than after abdominal section for all forms of diaphragmatic hernia, and thoracotomy is also a much easier operation, especially for stab wounds and traumatic rupture of the diaphragm.

DOUBLE-FACED SURGICAL ADHESIVE PLASTER.

DR. CHARLES LESTER LEONARD presented samples of a double-faced adhesive plaster. This plaster has a double coating. On one side zinc oxide and on the other plain rubber adhesive. Thus the plaster can be applied directly to the skin and covered with a bandage or can be made to hold the initial end of the bandage in place. It can also be utilized to hold compresses and splints in place insuring absolute fixation in their original position. Applied in strips between the layers of bandage it adheres to both fixing them intimately together preventing any displacement and increasing their rigidity, and consequently the support obtained for the parts. It is very serviceable, neat and effective as a method of fixing the loose end of any bandage, a transverse strip, the width of the bandage in length, beneath the end holding it firmly and neatly in position, a very desirable result, especially in dressings on the head and face. Local dressings, as in boils, abscesses or ulcers, can be held in place by strips, concealed beneath the final layer of gauze.

Other applications of this form of surgical adhesive plaster will readily suggest themselves to the surgeon when employing it in practical work, where it will be found particularly useful in fixing dressings, pads or splints to the skin.

Its only use has heretofore been in the retention of wigs and toupes and has not been utilized in surgical dressings or previously made in a form suitable for surgical application.

It is now manufactured in five-yard rolls one inch, one-half and one-fourth inch wide, and can be furnished, if desired, in sterile packages.

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