BRIEF COMMUNICATIONS

RELIEF OF POST-OPERATIVE MASSIVE COLLAPSE OF THE LUNG BY BRONCHOSCOPIC ASPIRATION*

TUCKER has recently reported two cases of post-operative massive collapse of the lung in which bronchoscopy with the aspiration of thick tenacious secretion caused immediate relief from symptoms, and restoration of the displaced heart and mediastinum to normal position. He believes that the collapse of the lung was caused by bronchial blockage from thick secretion and absorption of air beyond the point of obstruction and accumulation of fluid, as is seen in certain cases of foreign body impacted in a bronchus.

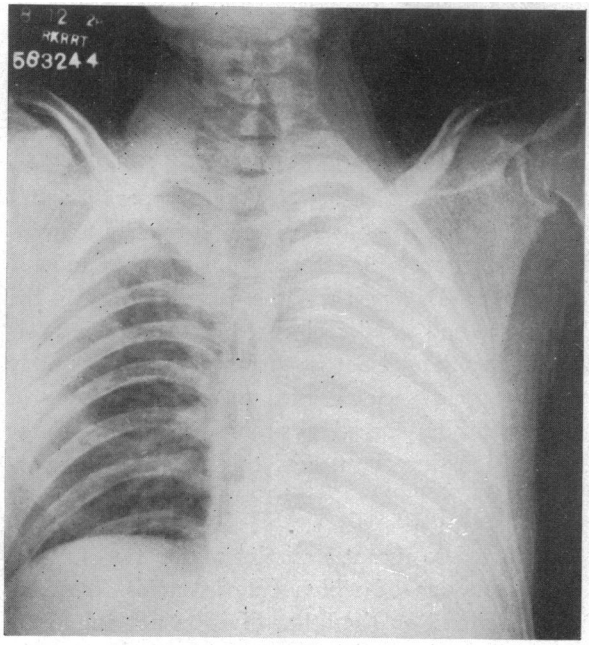

FIG. 1.—Initial röntgenogram showing massive collapse of the left lung and marked displacement of the heart and mediastinum.

There may be other factors in the production of this so-called pulmonary collapse. One factor that has received scant consideration is the post-operative posture of the patient. Webb, Forster and Gilbert have shown that if a normal person is placed on the right side for an hour there is marked displacement of the heart and mediastinum to the right with atelectasis of the right lung. When there is normal postural deviation of the mediastinal structures, it is easy to understand how, immediately after operation, stagnation of the secretions on the compressed side with respiratory embarrassment may develop. The case presented here supports the latter hypothesis and shows the value of bronchoscopic aspiration of the retained bronchial secretion.

A man, aged twenty-eight, was operated on August 11, 1926, for removal of a large infected hydronephrotic right kidney. Ether anæsthesia was employed. The operation was long and difficult because of firm perinephritic adhesions. After the operation the patient was placed in bed on the left side. The following morning he noted a burning sensation beneath the sternum and in the afternoon a very severe pain in the left side

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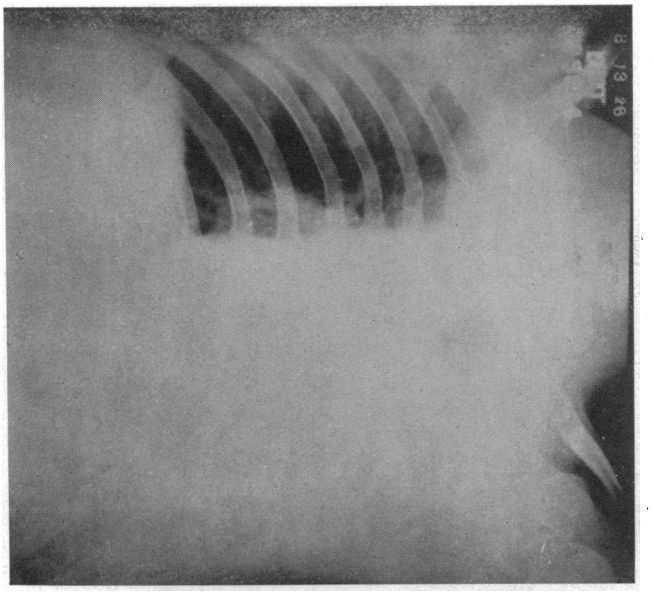

FIG. 2.—Twenty-four hours after first röntgenogram, showing marked increase in density.

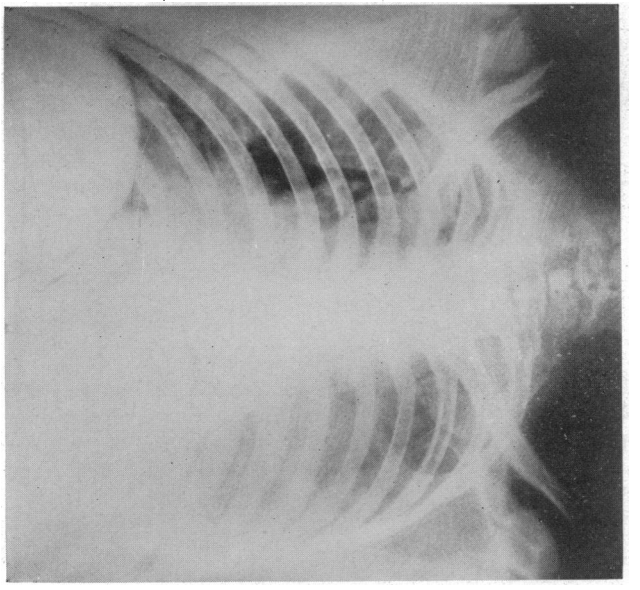

FIG. 3.—Examination of left lung showing marked clearing of left lung immediately after bronchoscopic aspiration, with restoration of heart and mediastinum to normal position.

of the chest. The temperature rose to 102°, the pulse rate to 110; respirations were 28. There was moderate cyanosis. The leukocytes numbered 7300.

Physical examination revealed displacement of the heart and mediastinal structures toward the left side, and marked diminution of breath sounds over the lower lobe of the left lung. Röntgen-ray examination revealed massive collapse of the left lung, and the heart and mediastinum pushed markedly toward the left (Fig. 1). The patient remained about the same for twenty-four hours, when dyspnœa and cyanosis became marked and the respirations were 48. Death seemed inevitable. The leukocytes had dropped to 4400. Röntgen-ray examination showed an increase in density over the left side of the chest (Fig. 2). Bronchoscopy was then performed under local anæsthesia, and on the introduction of the tube a thin serous secretion poured out of the trachea. About 300 c.c. of fluid was aspirated from the left lung. There was severe tracheobronchitis. Although all of the secretion seemed to come from the left lung, the consistency was not thick, as in cases observed by Tucker. The dyspnœa and cyanosis subsided immediately after aspiration of the fluid; a röntgenogram made fifteen minutes afterward showed the heart in normal position and marked decrease in the pulmonary density (Fig. 3).

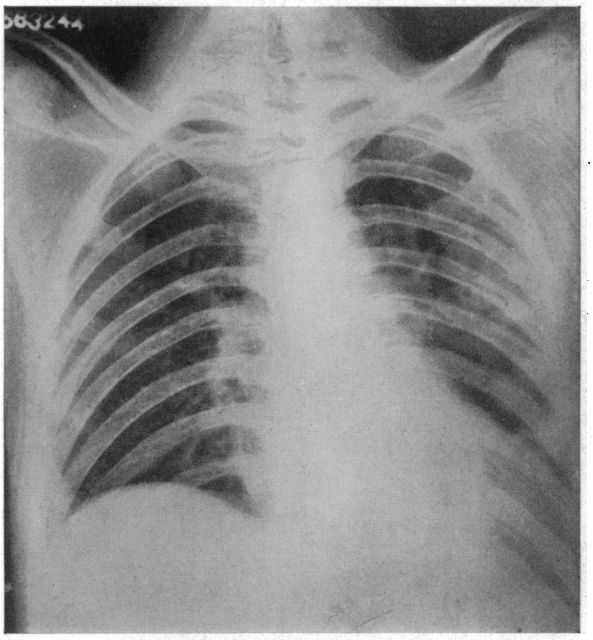

FIG. 4.—Condition of patient at dismissal.

Recovery from this time on was entirely uneventful, and the patient was able to leave the hospital on the sixteenth day. At the time of dismissal the röntgenograms of the chest revealed nothing abnormal (Fig. 4).

DRS. JAY R. COFFEY and PORTER P. VINSON were associated with the reporter in the care of this patient.

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TERATOMA TESTIS WITH METASTASIS

A man, aged thirty, was admitted to the National Military Hospital at Sawtelle, Cal., January 5, 1926, complaining of pain in the back and across the upper part of the abdomen. There was a large mass in the abdomen; also a lump in the scrotum.

He dated his present illness back to August, 1925, at which time he was forced to quit work. In September, 1925, at the Tacoma General Hospital, he stated that a tumor mass was found in his abdomen.

On admission at the Sawtelle Hospital the pains across the lower part of his back were practically continuous, sharp at times, at others dull and aching in character. They radiated from one side of the back to the other. Occasional similar pains across the upper abdomen were severe only after the manipulation of an examination. There had been some nausea but no vomiting. He had to take a cathartic every other day.

In January, 1924, there had been swelling, redness and soreness in the left testicle. There were no chills, but he thought he had some fever and he "felt badly all over." The swelling subsided every evening when he got off his feet. He could recall no trauma. Ten days later the condition had entirely cleared up. Three months later he noticed, for the first time, "a small, hard knot about the size of a large pea in the left testicle." It was not tender. The mass gradually increased in size until, at the time of admission here, it measured six by four centimetres. It had never been painful.

His weight and strength had held up well until August, 1925; since then there had been a gradual loss in both until he could scarcely walk across the room because of weakness and the pains in the back. He was poorly nourished, weighing 122 pounds (normal weight 158 pounds). The knees drawn up because this position relieves the pain in his back, especially of the left side. Moderate exophthalmos. The pupils round and equal, but react sluggishly to light. No pathology in the fundi.

There is moderate dilatation of the superficial veins of the chest. The superficial veins of the abdomen moderately dilated, more on the left. A large, firm, fixed, irregular, tender mass in the upper right quadrant, palpation of which makes the patient, "sick all over." The left testicle is hard, irregular, not translucent and not abnormally tender, and freely movable in the scrotum. Kernig 160 degrees right and left. Deep reflexes equal and hyperactive; the abdominalis absent. Slight tenderness in the lumbar and sacral regions; and bending backward causes pain.

Temperature subnormal, pulse 100, regular in force and rhythm. A trace of albumin in his urine. The blood findings: Hæmoglobin (Dare) 57 per cent., erythrocytes 4,024,000, leukocytes 9000, polymorphonuclear neutrophiles 75 per cent., lymphocytes 18 per cent., transitionals 6 per cent., myelocytes 1 per cent., Wassermann negative.

X-ray Findings.—The dorsal, lumbar and sacral spine show no positive evidence of injury or disease. Chest, both bases show marked annular, well circumscribed discrete shadows extending as high as the second interspaces. The lungs above and surrounding these areas show fairly good aeration. The apices are clear. Evidence of secondary metastasis. Gastro-intestinal tract, . . . in conclusion, malignancy of the antrum, first portion of the duodenum, . . . indirect evidence of malignancy of the liver.

He died January 26, 1926.

Autopsy.—Pleuræ adherent to chest wall most marked at the bases. Lungs interspersed with many grayish-white tumor masses well defined and regular in outline, varying in size from one and one-half to five cm. in diameter, more numerous at the bases. One of the larger ones showed necrosis. The liver a third larger than normal. Scattered through its substance numerous sharply defined regular grayish-white tumor masses ranging in diameter from one to four cm. The larger of these tumor masses showed necrotic changes.

The recto-peritoneal glands formed an irregular tumor mass extending along the left iliac vein from Poupart's ligament well up into the upper left quadrant, and across the midline in practically its whole extent. Two-thirds of the mass necrotic.

The left testicle measures five by three and a half cm. On section the lower pole made up of a rounded mass two and a half by two and a half cm. containing yellow caseous material.

The microscopical findings by Dr. Frank Sturdivant, Pathologist of the Pasadena General Hospital: "Sections from the testicle: The primary tumor in the testicle shows areas resembling typical carcinoma of the ducts, epithelium of the squamous type in islands, small areas made up of cartilage cells, and larger areas of degeneration. Sections from the liver show a metastatic tumor. It is entirely epithelial in character. Sections from the lung: The character of the cells in the metastatic tumors of the lung are, also, epithelial in character. Diagnosis: Teratoma testis, embryonal in type, with metastasis to the liver and lung. This is the usual site of metastasis of this tumor."

Sections sent to Dr. Frank Hinman * brought this reply: Sections of the testicular tumor show a confusion of structures, all more or less embryonal in character, representing all three germ layers. Most of the stroma is composed of rather embryonal connective-tissue cells. Occasional cells are seen that suggest nerve fibres. Smooth muscle cells are present in small numbers. Masses of cartilage, varying in structure from embryonal to adult types, are rather numerous. Ectoderm is represented by islands of squamous epithelium and by small cysts lined by squamous cells. Some of these islands show marked cornification. Many glandular structures of entodermal origin are present. Some of these have undergone malignant changes and carcinomatous areas are present everywhere throughout the sections. These carcinoma cells show relatively little variation in size and shape. Only an occasional mitotic figure is seen. Large areas of degeneration and necrosis are present throughout the tumor.

Sections of the liver show metastases. These metastases are entirely carcinomatous in character. Masses and strands of epithelial cells with some tendency toward alveolar and papillary arrangement are seen. The nuclei of these cells vary considerably in size and shape. Mitotic figures are fairly numerous. There is relatively little connective-tissue stroma.

Sections of the lung show similar metastases. There is, however, less tendency towards pattern formation and most of the cells are arranged in groups and diffuse sheet-like masses.

Diagnosis.—Teratoma testis, embryonal type, with carcinomatous areas of entodermal origin and carcinomatous metastases in the liver and lung.

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EXTRAPERITONEAL HERNIA OF THE BLADDER

THIS case is presented because of its diagnostic difficulties, increased surgical risk and unusual findings at operation.

E. L., colored male, Case No. 125,272, Wesley Memorial Hospital, was referred by the cardiac dispensary to the hospital on May 25, 1926, because of a painful mass in the right inguinal region.

This mass had been present for about thirty years but had not caused any trouble until several months ago, when the patient was seized with severe pain in the lower abdomen. This pain was located over the bladder and over the area of the mass. The pain was so severe that he was sent to the Cook County Hospital. In six days he got better and went home. The pain returned three days before admission and he was referred from the dispensary because of his cardiorenal condition to the local anæsthetic clinic.

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On admission a large well-developed, well-nourished, colored male was found. In the right inguinal region a soft, resilient, nearly fluctuating mass was found of the size of a goose egg. It was not reducible in size, could not be pushed back into the abdominal cavity, although it seemed to pass into the inguinal canal at the external ring. The palpating finger could not enter the external ring. It did not increase on coughing and pressing. The cord lay on the posterior lateral surface of the tumor. The mass could be separated from the testis.

On the day after admission, Doctor de Takats, with local anæsthesia, exposed the tumor by suitable incision. A resilient fluctuating mass was found here covered by the transverse fascia. The mass was distinctly separated from the cord, which lay posterior and laterally to it. On splitting the transverse fascia a fatty tumor of the size of a fist appeared which was isolated down to the external ring. The pedicle of this mass lay mesially to the epigastric vessels. On dissecting through the fat with two anatomical forceps, a thick muscular layer was found, which was identified as the bladder wall. The wall was hypertrophied and painful on pressure, because sacral nerves were not blocked. The opening through which the bladder prolapsed permitted only one finger-tip to enter. Several attempts to reduce the bladder through this opening were in vain because of the small opening. Therefore a laparotomy was made, starting from the external ring upward. It was now seen, that the prolapsed bladder wall is below the peritoneal reflection. Bladder could now be pushed back in place. There was no evidence of injury to the wall. The lateral vesical ligament was well visible. Peritoneum was closed. A transposition of the cord was made according to Bassini with duplication of the external oblique aponeurosis above the cord. Skin was closed with clips. Uncomplicated recovery.

Discussion.—Hernias of the bladder are not rare. Brunner found one in every hundred hernias. They may be inguinal, crural, perineal, obturatory, sciatic or even in the linea alba. Most frequently, however, they are direct inguinal hernias, like our case. As to their relationship to the peritoneum, they are intraperitoneal, paraperitoneal or sliding and extraperitoneal. The sliding type is the most frequent. From the analysis of the reported cases it is apparent that most of these sliding hernias are artificial and are produced by the traction on the hernial sack during operation. The extraperitoneal type, to which our case belongs, is very rare. Of a series of 180 cases of bladder hernia, only six of this type were found.

Predisposing factors to bladder hernia can be:

(1) *Bladder distention* due to prostatic enlargement, urethral strictures, bladder stone and diverticulum. In our case a polyuria and a pollakisuria were present. A connection between these symptoms and the prolaps of the bladder is hard to establish. The mass, according to the patient's history had been there for thirty years.

(2) *Prevesical lipomata* have been reported in all cases of bladder hernia. Their rôle just as that of preperitoneal lipomata in hernia formation has often been emphasized and as a predisposing factor generally accepted.

(3) *A weak inguinal canal,* which factor involves the whole question of hernia disposition. It seems clear, that an overdistended bladder with prevesical lipoma pulling it forward could never pass a normal external inguinal ring.

(4) *Previous injections* at the site of the hernia resulting in scar tissue formation may cause an adherence of the bladder to the inguinal ring (Finsterer's case).

The diagnosis is usually only made at operation and sometimes only when the bladder wall has already been perforated. However, the pre-operative diagnosis is possible if one only thinks of it. Following are the main diagnostic points: a resilient, fluctuating mass, separable from cord and testis, irreducible, painful on pressure, is always suggestive of bladder hernia. If the mass gets smaller after urination, or if a metal catheter can be introduced into the mass through the bladder, the diagnosis is made. These symptoms were not present in our case. The colics are felt over the mass and irradiate to the region of the bladder. A cystoscopic examination will easily reveal the condition.

In our case the colicky pain, which meant bladder incarceration, irradiated over the whole bladder. This symptom has been noted by one of the staff (Doctor Mason). This symptom, together with the other findings, should have aroused at least the suspicion of bladder hernia, which could then have been confirmed by cystoscopy. The diagnosis during the operation is made by the appearance of prevesical fat, below which the typical muscle layer appears. In our case the first attention was drawn to the bladder by the pressure pain, which is unusual in the hernia. Had the diagnosis been made before the operation, a block of the sacral nerves would have easily anæsthetized this part of the operation. As it was, it gave a diagnostic lead.

The incarceration of the bladder into the external ring was only partial. The constricting tissues do not seem strong enough to cause a gangrene. In our case, during cystoscopy an œdema of the involved region, with a small submucous hemorrhage was seen. It is impossible to decide whether this was due to the incarceration or the surgical trauma.

Sometimes even the ureteral opening or one of the ureters may be in the prolapse. This may cause a kink and a hydronephrosis. In other instances a diverticulum was found or a stone had formed in the prolapsed part of the bladder. There cannot be a very free communication between the two separated parts of the bladder, as pressure on the mass, like in our case, seldom reduces the size of the prolaps.

Collective statistics with analysis of cases may be found at Imbert (1896). Brunner (1898 and 1909), and more recently Finsterer (1912).

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SURGERY OF COMMON DUCT OBSTRUCTION

Cholecystectomy is the logical treatment for chronic cholecystitis, with or without stones. The gall-bladder is the birthplace for the large majority of gall-stones, and when infected carries the infection in its walls, so that its removal destroys the infection as well as reducing the chances for recurring stones to a minimum. Removal of the gall-bladder in uncomplicated biliary disease is fraught with very little danger to life, less than two per cent., and from a practical viewpoint causes no inconvenience to the patient.

Common bile duct obstructions are due to stones, post-biliary operations, malignancies, pancreatitis and peptic ulcers, in the order named. Stones by far predominate. It is logical to assume, therefore, that early removal of the gall-bladder in biliary disease will act in a large part in the prevention of duct obstruction.

Stone formation in the hepatic ducts is the exception, and whether or not stones can form in the biliary ducts is at present unknown. As far as is known, stone formation is dependent upon gall-bladder infection and an increase in the cholesterol content of the blood.

While surgery, of course, is the only method of dealing with common duct obstruction, surgery still carries an almost prohibitive mortality. G. P. Malley in a series of acute cholecystitis with common duct obstruction cites a mortality of forty per cent. In chronic cholecystitis with common duct obstruction his mortality was 19.2 per cent. It may be safely said that in all hands, the mortality of common duct obstruction to-day varies between fifteen and fifty per cent. Although transfusions, calcium chloride, glucose, reservation of heat, etc., may have reduced the mortality somewhat, still it is far too high for comfort.

The causes of the high mortality may be classified as follows: (*a*) Impaired liver function (back pressure) (toxæmia); (*b*) hemorrhage; (*c*) general peritonitis; (*d*) complications which may follow any surgical procedures. The last may carry a mortality of one per cent. or less. Therefore the first three carry by far the heaviest mortality.

If these three are the main causes of death therefore, it follows that if they can be eliminated, the mortality will be greatly reduced.

We have attempted to accomplish this in our recent work and now have a series of fifteen obstruction cases with one death, whereas formerly our mortality was very high. The death which occurred was in a case which necessitated a duodenostomy and died from general peritonitis.

The routine is as follows: First stage: Cholecystostomy. Second stage: Removal of duct obstruction. Third stage: Cholecystectomy. The first stage consists of exploration and drainage of the gall-bladder, care being taken to remove all stones in gall-bladder and cystic duct so that drainage will not be impaired. The tube for drainage is anchored to the gall-bladder with linen or silk and the wall is carefully invested about the tube to prevent leakage so as to reduce adhesions to a minimum.

The patient is then allowed to rest for several weeks or months if neces-

sary until jaundice has entirely disappeared and until blood-clotting, settling and viscosity are normal. Checking may also be made with the Vonden Bergh test—a very satisfactory test in this type of case.

When all these tests are normal the second operation is performed, removing the obstruction if possible, and always opening and draining the common duct, even in case of duodenostomy. The gall-bladder and its drainage tube from the first operation are not disturbed.

The tube in the common duct is removed in seven days and the tube in the gall-bladder removed several days later.

Whether or not to perform cholecystectomy, the third operation, is dependent upon the condition of the gall-bladder, found upon exploration. In my opinion it is advisable in all such cases to remove the gall-bladder, to prevent possible recurrences.

The above procedures, at first sight, might suggest difficulty in re-operating upon operated ground, but such has not been our experience. The few adhesions found at the second and third operation are readily dispersed to make way for the later procedures.

The procedures are not unlike preliminary cystotomy in advanced prostatic removal (two-stage operations). The advantages are as follows:

First: By preliminary drainage, back pressure on the liver, with return to normal function, is overcome. This in our opinion as the most frequent cause of death in these cases (toxæmia from low liver function).

Second: The danger of hemorrhage is absent by the removal of the bile pigments from the blood (removal of jaundice).

Third: Peritonitis is less apt to occur because of the walling-off process which follows the first operations—because of increased protective agencies of blood and peritoneum due to the removal of toxic substances from the blood—a certain amount of immunity produced (non-specific) following the first procedure.

Although our number of cases have been rather limited (fifteen), still it seems to me in following these cases that a condition which has hitherto carried a high mortality rate may be reduced in severity to one conforming with other surgical procedures, and should carry a mortality not to exceed two per cent.

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