were used in the two cases because two-thirds of the circumference of the colon was injured; in the other case the caecum had two or three small perforations. He had not used ether as a peritoneal dressing.

TWO CASES OF REMOVAL OF A BULLET FROM THE UPPER SURFACE OF THE DIAPHRAGM.

BY

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WHILST the lessons of war surgery have thrown much light on the immediate treatment of penetrating wounds of the chest and have prompted some most valuable additions to surgical literature, the later consequences of these injuries have received little notice.

It is a fortunate fact that not a few of these seriously wounded men recover, but some still carry in their chests the agent, whether shell or bullet, which caused the injury. These foreign bodies show a tendency to fall to the bottom of the thorax, coming to rest there on the upper surface of the diaphragm. In this position they may give rise to no trouble and no surgeon would suggest their removal. There are found, however, from time to time cases in which the foreign body is a cause of persistent and distressing symptoms.

In the first case which I report the man's life was made miserable by a constant "pricking" pain, and in the second case the soldier was quite incapable of any exertion, owing to the fact that an increase of respiratory movement beyond the normal produced at once a crippling amount of pain. The two cases are reported, not merely as examples of removal of foreign bodies from an unusual situation, but rather as instances of the help afforded to the surgeon by a simple method of "positive pressure anaesthesia." Thanks to this method, most ably handled by Major A. Wilson, the recovery of a bullet from the pleural cavity was carried out with perfect safety to the patient and was rendered, from the operator's point of view, little more than a minor surgical procedure. The details of the cases are as follows:

CASE I.

G. W. C., aged 24, was wounded in the right side of the chest by rifle bullet fired at long range. The bullet entered through the third right costal interspace three and a half inches from the middle line. Free haemoptysis occurred at once and continued in considerable quantity for twenty-four hours. He reached England at the end of five weeks, and during this time he had much pain in the lower part of the right chest, with frequent cough and daily haemoptysis. Although he stated, on admission to the 2nd Western General Hospital, that he had lost 2 st. in weight since his injury his general condition was excellent. The chest expanded well, and beyond a few moist sounds there was no physical sign of disease or injury. Cough was frequent, and the sputum always contained a little dark blood. The patient, though apparently well and comfortable in a sitting posture, was not able to lie down with ease, and was rendered very breathless by slight exertion. He complained constantly of a "pricking" pain, which he located deep to the sixth right costal cartilage.

Radiographic examination by Captain Bythell disclosed an intact rifle bullet lying on the upper surface of the diaphragm. The bullet was localized at a depth of two inches beneath a point marked over the sixth right costal cartilage and distant one half inch from the line of the right border of the sternum. As the pain continued after a month in hospital, and the patient's condition remained without change, save that the haemoptysis had ceased, it was decided to attempt the removal of the bullet.

Anaesthesia was induced by chloroform, and the tracheal catheter of the Ehrenfried's positive pressure apparatus having been introduced, the operation was carried out under ether vapour introduced under pressure by bellows. Through a curved skin incision the sixth and seventh right costal cartilages were exposed and denuded of their muscular and tendinous coverings, which were reflected downwards in one piece. A portion, $1\frac{1}{2}$ in. in length, of each costal cartilage was then excised. The opening thus made gave abundant access, and through it the parietal pleura was incised in a horizontal direction. A healthy, well-inflated lung presented itself on opening the pleura. The lung appeared and felt absolutely normal, showing no trace of adhesions.

On packing off the lung with a strip of gauze there was disclosed at once on the upper surface of the diaphragm a rounded eminence, in size and shape like the half of a small walnut shell. An incision into this yielded a few drops of turbid fluid, and the bright, unbroken nose of the bullet at once presented. This was seized and extracted without difficulty; it was lying

on the upper surface of the diaphragm, and had become covered and encysted by pale, friable fibrous tissue.

The gauze was removed and the parietal pleura closed tightly by a continuous stitch of fine chromic gut. The tendino-muscular flap was replaced by chromic gut sutures and the wound closed without drain. The colour and general condition of the patient were perfectly satisfactory throughout the operation.

Beyond a slight tracheitis, probably traumatic, which cleared up completely in three days, the convalescence was uninterrupted. The patient was discharged from hospital in four weeks. The "pricking" pain disappeared from the first and the man was able to move freely without breathlessness.

CASE II.

T. J. E., aged 21, was hit by a shrapnel ball at Suvla Bay. He stated that very free bleeding followed the injury—"blood running out of his mouth without cough." He gradually recovered, and does not appear to have suffered from any complications of the injury beyond occasional slight haemoptysis, which continued up to the time of his admission to the Manchester Royal Infirmary, six months after the injury. At this time the chest showed no abnormal physical signs and his general condition was excellent. The scar of the wound of entry lay over the inferior angle of the left scapula. The patient complained of much pain on exertion and located the pain at a point on the tenth left rib, a little in front of the mid-axillary line; he stated that the pain was very severe on deep breathing.

A radiogram by Captain Barclay showed an intact shrapnel bullet lying deep to the rib and fixed in the angle between the diaphragm and chest wall.

Anaesthesia was carried out, as in Case I, by Major A. Wilson with the help of Ehrenfried's apparatus. The operation was of the simplest nature. A portion of the tenth rib, about $1\frac{1}{2}$ in. long, was resected and the pleura opened by a horizontal incision. The bullet was at once evident and was picked without effort off the upper surface of the diaphragm. The edge of the well-inflated lung was well seen, and as far as it could be inspected through the limited opening the lung appeared to be quite healthy and free. The pleura was closed with fine chromic gut.

The after-history of the case was quite without incident; the patient was discharged in a fortnight in excellent condition, having had neither haemoptysis nor his former pain since the operation.

TIME IN SURGERY.

BY

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THE priceless value of time in surgery is often overlooked, and fleeting opportunities of successful action are frequently allowed to pass with disastrous consequences. Again and again diagnosis is delayed or operation deferred until it is too late either to save life or to secure the best result. For instance, the early signs of grave abdominal diseases are too often attributed to trivial ailments, and a "wait and see" policy adopted until such irreparable damage is wrought that complete recovery is impossible. In such cases the greatest vigilance is required to determine the proper time to "look and see."

Two typical cases of appendicitis serve to illustrate these points. They were very similar in their early signs, but treated differently and attended by very different results.

CASE I.

- (a) Diagnosis made within twelve hours.
- (b) Operation within thirteen hours.
- (c) Appendix removed, gangrenous, but not perforated.
- (d) General condition good.
- (e) Gridiron incision.
- (f) Abdomen closed.
- (g) Patient up from fourth day; taken to the country on the ninth day. Quite well three weeks from operation.
- (h) Patient has been in perfect health since the operation.

CASE II.

- (a) Diagnosis, abdominal influenza. After nine days, appendical abscess diagnosed.
- (b) Operation after ten days.
- (c) Large abscess opened. Appendix not found owing to the large size of abscess and the grave condition.
- (d) General condition very bad.
- (e) Battle incision, as the surgeon thought he could get more room in this way.
- (f) Drainage on and off for six months; then appendix removed at second operation. Drainage another two months.
- (g) Patient up after ten months. Large gap in abdominal wall with hernia at the end of twelve months. General condition too bad for operation to reconstitute the abdominal wall at present.
- (h) Patient has suffered much pain and misery.