Clinical and other Notes.


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Wounds which are caused by the implements of war tend to differ in their site and severity from those commonly seen in civilian practice. War wounds involving the abdomino-thoracic region are often associated with a high mortality due to the importance of the organs involved and, because of the problems in diagnosis and treatment they present, they are of more than ordinary interest. The late results of such injuries are not often seen and this communication records such a case in the tentative hope that it may be of some value in the consideration of the inevitable future cases.

A soldier, aged 26, was stabbed by a knife in the left side of the chest and left hip on January 17, 1941. He was taken to hospital where examination showed a portion of the great omentum protruding through the chest wound. The following day laparotomy was performed under general anaesthesia, through an upper abdominal mid-line incision and the wound was found to extend from the exterior through the chest wall, pleura and diaphragm into the abdominal cavity. There was no intra-abdominal bleeding or visceral damage and, after excision of the protruding omentum, both abdominal and chest wounds were closed without drainage. The buttock was also sutured.

Though healing throughout was by primary intention the patient did not make the anticipated rapid progress. He developed a cough, and clinical examination showed left basal impaired resonance with diminished breath sounds but, though these findings later became less pronounced, they never entirely disappeared. X-ray examination on February 13, 1941, that is, twenty-seven days after the injury, recorded “the heart seen to be slightly displaced to the right, and the left side of the diaphragm raised.”

On February 24 vomiting occurred several times and the patient complained of pain behind the sternum. These symptoms continued for several days and were only partially relieved by the administration of alkalies. A barium meal examination was therefore carried out and the Radiologist reported “left side of the diaphragm raised, no evidence of obstruction in the stomach.”

It was shortly after this, on February 25, that the patient first came under my care at No. 16 British General Hospital. He was then complaining of intense “burning” pain behind the sternum, constipation since his operation five weeks before, and dyspnoea on exertion. When examined, his condition was fair only and pallor was noticeable. His temperature was 98.8° F, pulse 96, respiration 20; he had obviously lost weight and admitted this on further interrogation and he was still vomiting small amounts of frothy colourless fluid which last may have accounted, in part at least, for his well-marked exhaustion. There was a soundly healed supra-umbilical mid-line scar and
two healed stab wounds, both one inch long, one in the 7th left intercostal space in the mid-axillary line, the other in the left gluteal region 3 inches below the midpiont of the iliac crest. The only physical signs elicited were: in the abdomen, some tenderness below the left costal margin and, in the chest, impaired resonance with diminished breath and voice sounds at the left base posteriorly extending as high as the inferior angle of the scapula. The apex beat was not apparently displaced. There was, however, a noteworthy feature in the presence of a gurgling sound, audible by auscultation of the area, which showed the other abnormal signs. Furthermore, the minor exertion of being examined caused the patient to become markedly dyspnœic.

**Blood Examination Report.**—Blood pressure: Systolic 118; Diastolic 75. Blood examination: Hæmoglobin 96 per cent; R.B.C. 4.25; W.B.C. 8,200. Differential count: Polymorphs 49 per cent; Lymphocytes 43 per cent; Eosinophiles 3 per cent; Monocytes 5 per cent. Blood Group: “A.”

**Urine Examination.**—Specific gravity: 1020; Reaction: alkaline; Albumen: negative. No reduction of Fehling’s solution. Microscopic examination of centrifuged deposit: Negative.

From the history, symptoms and physical signs, I made a diagnosis of "left-sided traumatic diaphragmatic hernia." The patient’s condition steadily deteriorated. Vomiting increased in frequency until it became almost continuous and rectal saline was instituted to combat the resultant dehydration. The vomit resembled the brown frothy fluid usually associated with acute dilatation of the stomach and went on unabated but after twenty-four hours on intravenous glucose saline recovery was sufficient for a barium meal examination to be performed. The report, dated March 8, confirmed the diagnosis and read as follows: "distortion of the cesophageal entry to the stomach. Supra-fundus loculus supra-diaphragmatic. The loculus fills in the prone position."

The patient was now so ill that extensive surgery was on no account to be considered but, in an attempt to relieve his symptoms, the left phrenic nerve was crushed in the neck under local anaesthesia. The improvement was slight and only continuous intravenous glucose saline combined with half-hourly gastric suction through a Ryle’s tube succeeded in making the patient at all comfortable.

By March 11, the man’s condition was so desperate as almost to prohibit surgery which offered the only and forlorn hope. After thirty hours’ intravenous drip blood transfusion, he was taken to the theatre and anaesthesia was induced by pentothal sodium followed by intratracheal gas and oxygen.

The transpleural approach was chosen using a long incision in the 6th left intercostal space, the chest was opened, the lung allowed to collapse slowly, the 6th and 7th ribs were divided posteriorly, and there resulted an excellent exposure.

On direct inspection, two openings were seen in the diaphragm; a smaller one, the lateral, 1 inch in diameter, in the muscular portion, 2½ inches from the exterior in the mid-axillary line and a larger one in the tendinous portion, 1 inch medial to the first, 1½ inches in diameter. A piece of omentum protruded through the lateral opening and through the medial a loculus of stomach greatly dilated and atonic. Both stomach and omentum were adherent to the edges of the apertures, to each other and to the base of the lung.

The adhesions were divided, those between the loculus of stomach and the diaphragmatic aperture proving the most difficult. The protruded
portion of the omentum and the herniated loculus of stomach were returned to the abdominal cavity through their apertures in the paralysed diaphragm. Then these two apertures were converted into one by division of the intervening strip of muscle, and the actual closing of the new larger opening was effected, after the fashion of Mayo's repair of an umbilical hernia, by overlapping the cut edges. The chest was closed without drainage.

The patient withstood such a major procedure surprisingly well and intravenous drip saline proved beneficial for the next forty hours. The next day, 7 ounces of blood were transfused, but there was a moderate reaction, with rigor, tachycardia, sweating and laboured breathing, so that this treatment was stopped. The salient effect of the operation was dramatic. Vomiting did not occur again and two-hourly feeds of half milk and half water could be increased so rapidly that an almost full diet was ordered within a week.

On March 15, the patient developed a cough with sputum but this was cured completely within ten days. Also, during the early post-operative days, he had attacks at frequent intervals in which the cardinal features were profuse sweating with intense dyspnoea, but inhalation of an oxygen-carbon dioxide mixture gave complete relief. A small effusion developed in the left chest but it was not necessary to aspirate this as complete absorption occurred in ten days.

Beyond these minor episodes recovery was wholly uneventful, the wound healed by primary intention and the patient was allowed out of bed within a fortnight.

X-ray examination on March 28 showed almost complete collapse of the left lung and a course of breathing exercises was ordered. A series of X-rays of the chest, at approximately fortnightly intervals, showed that the lung was expanding and the last examination, on May 4, showed the lung expansion to be complete. The general condition of the patient improved immeasurably and, at the time of writing, he is gaining weight at the rate of 9 pounds a week.

DISCUSSION.

(i) The diagnosis was established with comparative ease from history, symptoms of dyspnoea, dyspepsia and retrosternal pain, together with the physical signs in the chest. The radiological examination merely served to confirm it.

(ii) Immediate cure would, I think, have resulted from suture of the diaphragmatic wounds if undertaken at the first operation but the abdominal approach makes such a procedure difficult. Moreover, if laparotomy is performed as an emergency for injury of the abdominal viscera, a small wound in a moving diaphragm is easy to miss.

(iii) The constant respiratory excursions of the diaphragm militate against spontaneous healing of its wounds and the negative intrathoracic pressure tends to suck the more mobile abdominal organs into the pleural cavity. Such appears to be the mechanism of herniation in this case.

(iv) Two apertures were found in the diaphragm and experience in this and other similar cases suggests that such a number, rather than a solitary opening, is not infrequent. This fact can be explained by the straight line course of weapon or bullet travelling from below upwards, cutting across the concavity of the diaphragm, with or without associated visceral injury in the abdomen.
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(v) Constriction of the herniated portion of the stomach, with its consequent subacute dilatation and the fact that, for anatomical reasons, the Ryle's tube could not reach the loculus to drain it, resulted in a condition of unrelievable vomiting. This corresponded with the clinical experience and the dramatic response to operation.

(vi) The crushing of the left phrenic nerve in the neck failed as a palliative measure because it was the tendinous part of the diaphragm which constricted the loculus of stomach and I suggest that the tendinous part cannot undergo muscular relaxation.

As a means of paralysing the diaphragm for purposes of easing the operative technique, crushing is best done at the time of the major procedure at the point where the nerve crosses the left auricle.

(vii) The post-operative attacks of dyspncea with sweating seem to defy explanation. The response to oxygen-carbon dioxide mixture was very rapid and relief was always complete within an hour. There was never a concomitant cyanosis so that I postulate a nervous rather than a mechanical cause.

Conclusions.

(i) Transpleural surgical approach described above for repair of diaphragmatic injury yields an excellent exposure, and the technique of suture is not then difficult.

(ii) When a wound appears to involve the abdomino-thoracic junction, the examination carried out at operation should include careful palpation of the diaphragm; this is because two wounds should be suspected in that organ when the direction of the track of the wound is from below upwards, on account of the anatomical considerations already put forward and corresponding with clinical experience.

I would like to express my gratitude to Colonel D. C. Monro, Consulting Surgeon to the Middle East Force, for invaluable criticisms and suggestions.

TROPICAL BUBO OR LYMPHOGRANULOMA INGUINALE.

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To the Medical Officer newly arrived in the Tropics the first few cases of lymphogranuloma inguinale are liable to be most puzzling. These few notes are based on an experience of well over one hundred and fifty cases and may be of help to those serving on the West Coast of Africa for the first time.