DIAPHRAGMATIC HERNIA OF THE ENTIRE STOMACH.

BY

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In the *British Journal of Surgery* for July, 1921, there is published a very full and interesting communication on injuries of the diaphragm, with special reference to abdomino-thoracic wounds, by C. W. Gordon Bryan, of St. Mary's Hospital, London. In this article all that has been written on the subject of diaphragmatic hernia has been reviewed, including a case of diaphragmatic hernia of the entire stomach and great omentum published by me in the *BRITISH MEDICAL JOURNAL*, 1919, ii, 412.

The following case is worthy of being put on record, as it presents some features differing from the cases already published:

On May 17th, 1921, Private R. P. was admitted to Bellahouston Hospital, Glasgow, under my care. He was wounded on September 2nd, 1918, in the left lower chest wall by a portion of an explosive shell which penetrated both the chest and the abdomen. At the casualty clearing station the foreign body was removed, and he was told that the spleen was so severely damaged that it had to be excised. He was discharged from the army on May 31st, 1919, with the wounds completely healed. He worked for nine months thereafter, but had to cease work on account of increasing weakness and of pain after food followed by vomiting. During the following year he was treated for gastritis.

On admission to the hospital he complained of pain in the epigastrium immediately after taking food of any kind, liquid or semi-liquid, and of vomiting of the food fifteen to thirty minutes after. He stated that he had vomited everything that he had taken during the last three weeks before admission, and that the vomiting had relieved the pain. His general condition was bad; he was very emaciated and exhausted, and weighed only 6 st. 7 lb. His face was earthy in colour, his cheeks were sunken, and the tongue was coated and dry. There was a healed indrawn scar in the lower left lateral chest wall, and the appearance as if a portion of the ribs had been removed. He suffered also from cough and had a muco-purulent expectoration. The percussion note was dull at both bases, though slightly tympanitic at the left base. Respiratory murmur, vocal resonance, and vocal fremitus were diminished at the right base and completely absent at the left base. Crepitation was audible at both apices. The abdomen was scaphoid in shape, and rigidity of the abdominal wall made palpation difficult. The stomach outline was impossible to make out by percussion. Pain, tenderness, and rigidity were most marked in the left hypochondriac region. As he vomited everything, even diluted milk, a few minutes after swallowing—the recumbent position made no difference—he was fed by the rectum. Nothing was given by the mouth. His pain lessened, the vomiting ceased, and his general condition slightly improved.

On May 27th, 1921, the abdomen was opened by a paramedian incision above the umbilicus. The entire stomach was found to have disappeared through a hole in the diaphragm; the cardiac and pyloric ends of the stomach met at the opening. The cardiac end appeared pouched as if the liquid nourishment had lodged there before its expulsion. The spleen was absent. The left rectus muscle had to be divided for better exposure. The stomach, which was adherent to the edges of the opening, was separated with some difficulty and drawn back into the abdominal cavity. The walls of the stomach were greatly atrophied, but bore no evidence of having been wounded; no cicatrization was visible on the serous coat. The gap in the diaphragm measured 2½ by 2½ inches, and was situated between the fibres arising from the left external and internal arcuate ligaments, and extended up to the left leaflet of the central tendon. The edges of the gap were firm, hard, and almost tendinous in character. As he was very collapsed, no attempt was made at this operation to close the opening in the diaphragm. The pleural cavity was lightly packed with flanne gauze and the ends of the packing were brought out at the upper part of the abdominal wound. As the defect in the diaphragm was closed by the packing the stomach could not for the present find its way back to the pleural cavity. The abdominal wounds were closed by through-and-through stitches. After a few days of liquid diet he was put on light solid food and relished everything he got. He had no discomfort after food and the cough became less troublesome.

It was decided (June 10th, 1921) to make an attempt to close the opening in the diaphragm from the thoracic side. An osteoplastic flap was reflected upwards, dividing the sixth, seventh, and eighth ribs in two places. This flap was temporarily stitched backward on to the thoracic wall and gave a very good exposure of the pleural cavity with its packing. The gauze was removed and the cavity disinfected. Two flaps of thickened pleura were then dissected from the undamaged portion of the diaphragm and reflected over the gap, completely closing the opening. Though the lung was collapsed it was seen to inflate partially during deep inspiration, and we decided to employ deep breathing exercises as soon as it was practicable. The osteoplastic flap was replaced in position, the periosteum of the opposing ribs stitched together, and the wound closed except for a few strips of gutta-percha tissue

for drainage. He stood the operation very well. His convalescence was uninterrupted. Both wounds were completely healed at the end of three months. The note at the base of the left lung had become slightly resonant in tone as if some expansion of the lung had occurred.

I wrote to him in December, 1922, and he answered that he was quite well except that he could not digest heavy food, and that his weight was 8 st. 2 lb.

Almost all the chronic cases published have an insidious onset. This man was wounded in September, 1918, and was operated on in May, 1921, two and a half years from the date of his wound. His symptoms were gradual in onset, probably becoming worse as more and more of the stomach passed into the pleural cavity. As in my previous case, he was treated for gastritis and the condition was not recognized until his admission to hospital. The situation of the wound and the experience gained in my former case led me to think of diaphragmatic hernia as a possible diagnosis. He was too ill to be submitted to a x ray examination and, moreover, would have vomited the barium meal. His general symptoms were similar to those published in other cases—pain immediately after food or drink, and relieved almost at once by vomiting, followed naturally by extreme emaciation, anaemia, and constipation. The intestines in this case were empty and their walls greatly atrophied.

To have attempted reduction of the hernia and repair of the defect in the diaphragm at the same sitting would have been to court disaster. The abdominal route of exposure at the first operation enabled us more readily to free the stomach from its attachments to the opening in the diaphragm and to examine its condition. In my former case I closed the opening in the diaphragm from the abdominal side; in the present case this would have been a matter of great difficulty. If the case be chronic and the operation of reduction of the hernia and closure of the opening can be done at the same time the thoracic route of approach has many advantages. The thoracic route is well spoken of in the article by Bryan already referred to.

I thank the Ministry of Pensions for permission to publish the case and Dr. William Cunningham, now of Monkseaton, Northumberland, for his able assistance at both operations.

HYDATID CYSTS OF LIVER

ASSOCIATED WITH GALL STONES AND EMPYEMA OF GALL BLADDER AND PLEURA: RECOVERY.

BY

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THE case which is here reported is that of a lady who was first seen in April, 1910; she was then aged 43, and has remained more or less under medical care and treatment for the past twelve years.

History.

When first seen she was suffering from acute pain in the abdomen and a burning sensation shooting up to her throat and into her back. She was vomiting a fair quantity of acid fluid. In aspect she was a soft flabby-looking woman, and stated that she had never been very strong.

Examination showed some tenderness in the epigastrium and also in the right hypochondrium. A provisional diagnosis of gastric ulcer was made. Under dietetic and medicinal treatment the attack gradually subsided in nineteen days.

In August, 1911, she had a similar attack, this time vomiting blood. Under the same treatment the attack subsided in ten days. At this time she was also suffering from nervous symptoms attributable to climacteric changes, and required treatment until February, 1912.

In February, 1913, she had a third attack of pain, referred to the right side of the chest. Breathing was painful, but no evidence of pleurisy was found. In July, 1913, the uterus was cured for menorrhagia. In May, 1914, she was treated for the fourth attack of pain and vomiting, which lasted a week. In June, 1916, she had a fifth attack, lasting fourteen days.

Between June, 1916, and June, 1919, she had repeated attacks of gastric pain and vomiting, each attack lasting ten to fourteen days. Thereafter she steadily improved in health, but always had to be careful of her diet for fear of so-called indigestion. At this period gall stones were suspected to be the cause of her repeated attacks of abdominal pain and vomiting. Examination of the abdomen always revealed the presence of marked tenderness in the epigastrium and some tenderness over the site of the gall bladder. On February 9th, 1922, during the night two urgent messages were received to attend this patient, who is now aged 55, but it was not possible to see her until 8.30 the next morning. On arrival at her

house she was found to be collapsed with severe abdominal pain, which, she said, began in the right hypochondriac region, radiating across the abdomen and up to the right shoulder-blade. She had had several loose motions and vomited several times, mostly a bile-stained fluid.

Examination showed marked tenderness at the level of the tenth rib on the right side, and palpation caused pain to be felt in the back. There was a sensation of a tumour in the region of the gall bladder, but this was somewhat indefinite owing to the thickness of fat of the abdominal wall. There was no jaundice; no tenderness over the appendix. The breath sounds over the chest were normal. Temperature 99°, pulse 100.

A provisional diagnosis was made of a distended gall bladder (probably mucocele) with passage of gall stones into the common duct. Operation was advised, but the patient decided to wait events for a day or so. She was therefore treated on February 11th and 12th with fomentations and bromides, with no relief to symptoms of pain. Temperature 98°, pulse 100.

On February 13th, finding she was not improving, and before agreeing to an operation, she desired a consultation, and accordingly was seen by Mr. H. F. Vellacott. He agreed with the diagnosis made and advised immediate operation. The patient now agreed to submit to operation and was removed to a nursing home.

First Operation.

The same day, at 4 p.m., an operation was performed, Mr. H. F. Vellacott assisting. Dr. Rosa Bale gave the anaesthetic, first inducing with chloroform, followed by ether. An incision was made splitting the right rectus. On opening the peritoneum a large distended gall bladder was exposed and found to be full of small calculi (133 were subsequently removed). The gall bladder was adherent to the colon, from which it was freed. No stones were found in the common duct. As some difficulty was experienced in removing some stones in the cystic duct the gall bladder was opened. On opening the gall bladder a number of stones were removed and at the same time the liquid purulent contents came away together with the whole lining of the gall bladder, which was gangrenous—in fact the examining finger went through the necrotic muscular and serous coats of the gall bladder. The gall bladder was then resected, the cystic artery being tied separately. The appendix was then sought for and removed. The stomach, which was very much distended, was examined for gastric ulcer, but none was found. The wound was stitched up, a tube and gauze drain being put down to the site of the stump of the cystic duct.

Progress.—The patient made a rapid recovery, and was digesting an ordinary diet at the end of a week. She left the nursing home at the end of four weeks, having had a normal temperature for three weeks. The only complication was a stitch abscess, which healed up when some catgut came away. Whilst in the nursing home a report was received from the night nurse that the patient had had a rigor on the seventeenth day after her operation, and some vomiting; the temperature was 99°, pulse 100. Under treatment of hot drinks and a dose of aspirin the attack subsided, and it did not recur again. Not much notice was taken of this attack at the time, as the wound was healing well, and the general condition was otherwise quite good. It was regarded as of nervous origin. She left the nursing home on March 11th.

After being at home convalescing for three weeks, an urgent message was received on April 1st, seven weeks after the operation of cholecystectomy, because the patient had had a rigor, and also complained of excruciating pain in the right shoulder and neck; she was aching all over. Temperature 103°, pulse 110. Examination of the chest revealed nothing. The abdominal wound showed no tenderness. As influenza was in the house the attack was thought to be influenzal.

The next day the pain was in the left side of the chest. The following day the pain radiated down the right arm and right side of the neck (phrenic nerve pain). Examination of the chest revealed nothing.

By April 9th, examining the chest daily, it was noted that there was gradual diminution of breath sounds and increasing dullness up to the level of the seventh rib posteriorly. After the original rigor the temperature ranged from 98° to 99°; the pulse, however, was very quick—110, 120, 140, at times, accompanied by profuse perspiration. A diagnosis of subphrenic abscess was made.

On April 11th Mr. Vellacott again saw the patient and he performed an exploratory puncture, first in the tenth intercostal space, and, nothing being found, then posteriorly near vertebra, and pus withdrawn—the first syringe being pure pus and the second of a tomato colour. The patient's condition was very grave, and she was again removed to the nursing home.

On April 12th her condition rapidly became much worse and pain was very severe. She was gravely collapsed. Temperature 103°, pulse 120 to 130.

Second Operation.

Under gas and oxygen, given by Dr. Rosa Bale, Mr. Vellacott resected the tenth rib. After sewing the pleura to the diaphragm an incision was made into the liver. Large quantities of dark blood and clots escaped. The abscess was not at first found. Sinus forceps were pushed into a large abscess in the right lobe of the liver and about three pints of pus were evacuated. A large drainage tube was put in. Examination of the pus revealed the presence of numerous cysts.

A diagnosis was made of hydatid cyst of liver, and Dr. Wordley, pathologist to the South Devon and East Cornwall Hospital, reported that he had found numerous hooklets.

Progress.—The patient was very critically ill for the next fortnight, but the tongue began to clean and appetite slowly came

back. On April 21st it was necessary to aspirate the right base, and about 8 ounces of serous fluid were withdrawn. The wound discharged large quantities of pus and fragments of cysts and cyst wall. It was treated by frequent irrigations of Dakin's fluid (two-hourly). Her general condition, however, was not satisfactory; she had an irregular temperature—102° to 103°—with a rapid pulse of 120 to 130, and a respiratory rate of 30 to 50. Dullness of lung increased and fluid was diagnosed as present up to the level of the sixth rib. Believing she was going to die, and wishing to be at home, she refused to remain in the nursing home, and was consequently removed by ambulance to her own home on May 3rd. That evening the temperature was 103°, pulse 126, respirations 40.

On May 4th she permitted an aspiration, and 40 ounces of purulent dark bile-stained fluid were removed. This gave some relief. Examination of the fluid by Dr. Wordley showed no hooklets to be present. She consented to be operated on again.

Third Operation.

On May 5th, under gas and oxygen administered by Dr. Rosa Bale, the third operation was performed, assisted by Mr. Vellacott. The eighth rib was resected and from the pleural cavity a few ounces of pus were drained. Considering her grave state she stood this operation very well. A large tube was left *in situ*. That evening the temperature fell to 97.6°, pulse 110, respirations 25.

From this date she began rapidly to improve and the temperature never rose again. The pleural sinus was healed six weeks later and the lung had recovered from its collapse. By June 14th she was able to be out of bed, and ten days later to go for a drive. The sinus in the liver is now reduced to about 1½ in. and admits a fine probe. Some pus still discharges at times, but it is lessening. She is able to perform some of her household duties and goes out for walks daily.

A large measure of the success attained in this case was due to the patient being given gas and oxygen (Boyle method) by Dr. Rosa Bale, which thereby reduced the severe shock of the last two operations. The original source of infection has not been ascertained.

THE RADIATION OF PAIN IN LESIONS OF THE FALLOPIAN TUBE.

BY

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The physical signs of diseases of the Fallopian tube have been described with great minuteness, but less attention seems to have been paid to a description of the subjective symptoms, and particularly of the radiation of the pain which occurs in these conditions.

The pain arising from an affection of the tube is rarely distinguished from that due to involvement of the neighbouring parietal peritoneum. Thus, as symptoms of salpingitis, are mentioned pain and tenderness on pressure in the iliac fossa, in the mid-line in the hypogastrium, and also posteriorly in the loin—that is, the pain of salpingitis is confused with that due to the local peritonitis. But the Fallopian tube, like other hollow viscera, reacts to disease by pain which is referred to the skin over an area dependent upon the spinal segments from which it receives its innervation. From a consideration of the cutaneous hyperaesthesia in a case in which the tube was involved, Head¹ considered these to be the eleventh and twelfth dorsal and first lumbar segments. This view appears to admit of some modification, for in the cases described below of various lesions of the Fallopian tube the pain complained of was felt in an area wider than that governed by these three segments. It was felt in the loin, in the iliac fossa, and was said to pass down the anterior surface of the thigh to the knee. This distribution appears to be peculiar to the Fallopian tube, and its recognition may be of value in arriving at a topographical diagnosis.

Case 1.—A married woman, aged 21, complained for some time of pain "like a toothache" of great severity in the left iliac fossa. She suffered also at times from pain of slighter intensity round the umbilicus and in the right iliac fossa. At operation (by Dr. Tenison Collins) there was found a large left-sided hydrosalpinx and cystic ovary, and a long appendix.

The following cases show the typical radiation of pain down the thigh.

Case 2.—A married woman, aged 22, complained for a year of irregular menstruation, menorrhagia, metrorrhagia, and dysmenorrhoea. She suffered from pain in the right iliac fossa, which passed down the front of the thigh as far as the knee (information volunteered); occasionally pain was felt also in the small of the back. The pain was very severe, shooting in character, and sometimes lasted for the whole day. Pain was also felt in the