

TRAUMATIC RIGHT DIAPHRAGMATIC HERNIA WITH EVISCERATION OF STOMACH, TRANSVERSE COLON AND LIVER INTO THE RIGHT THORAX*

J. WALTER NEAL, M.D., M.Sc. (SURG.)

RALEIGH, N. C.

DESPITE THE MECHANICAL AGE in which we are now living, traumatic right-sided diaphragmatic herniae are extremely rare. This rarity may be explained by the fact that the liver shields the dome of the right diaphragm, and an injury of the severity required to produce such a hernia may often cause death of the patient before surgical repair can be instituted. In reviewing the American literature, it was found that only ten such cases have been reported.^{4, 8, 9, 11, 13, 16} A few cases have been published in the foreign literature, chiefly by South American writers. The 430 cases of diaphragmatic hernia treated surgically by Harrington⁵ is the largest series reported, and he found only one hernia on the right side of traumatic origin. Numerous cases of congenital right diaphragmatic hernia in children have been reported.^{1, 2, 6, 12, 17, 19} Several reports of congenital right diaphragmatic hernia in adults have been published.^{3, 10, 14, 17, 20}

The various types of diaphragmatic hernia, the site of the openings through the diaphragm and the different methods of surgical treatment have been publicized.^{4, 5, 7, 15}

REPORT OF CASE

Case No. (237378). T. M., a 31-year-old colored male was admitted to the Central Prison Hospital in November, 1950, complaining of pain in the right lower chest radiating to the right subscapular region. His trouble dated back to April, 1946, when he was struck by an automobile while walking on the highway. About two hours later he

was admitted to James Walker Memorial Hospital, Wilmington, N. C., in shock and unconscious. He had received a severe crushing injury to the abdomen, pelvis, and lower extremities. At that time, it was noted that there was decreased breath sounds throughout the right lung field anteriorly. Roentgenographic examination of the right chest showed mottled density through the right lung, and marked elevation of the right diaphragm with a small amount of air seen beneath the diaphragm near the costophrenic angle. The left lung field appeared normal. Examination of the pelvis showed a comminuted fracture of the right pubis which involved both the ascending and descending rami of the pubis. There were bilateral compound comminuted fractures of both bones of the legs. Ten days after the accident, a thoracentesis in the right posterior axillary line at the site of the seventh interspace was performed, and a small amount of bloody serum was withdrawn.

After a stormy course of four weeks, he was discharged with a cast on each leg for bed rest at home. In six months he was allowed up on crutches, and at that time, he began to have pain in his right chest which he described as "something pulling inside his chest." He also experienced upper abdominal distress which he attributed to "gas." This distress was not relieved by sodium bicarbonate. He had attacks of nausea and vomiting, and at other times, obstinate constipation and symptoms of recurring partial intestinal obstruction. He stated that occasionally a full meal would cause epigastric distress and he would hear "gurgling" in his right chest. These symptoms were aggravated when the patient lay on his right side, and were relieved by vomiting or passing gas. Frequent laxatives were taken to relieve the gas and constipation. Following the accident, he was subject to frequent attacks of chest colds and episodes of coughing. He stated that at times he experienced a sense of fullness, dyspnea or suffocation on the right side, which he described as "something cutting off his breath." All these attacks and episodes were intermittent, there being long intervals,

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sometimes for several weeks, of complete freedom from symptoms.

Physical examination at this time revealed a well developed, fairly well nourished negro man, who was not acutely ill. His blood pressure was 120/80, temperature 98.6°F, pulse 74, and respiration 20. The right chest showed decreased expansion on inspiration. There was diminished to absent tactile fremitus over the lower one-half of the chest. Percussion note was tympanitic below the third interspace anteriorly, and dull over the lower one-third of the chest posteriorly. Breath sounds were absent anteriorly below the third interspace and were diminished to absent posteriorly over the lower one-third of the right chest. The left chest was normal. Abdominal examination revealed a healed right inguinal incisional scar. There were no palpable masses or areas of tenderness. The liver edge was not palpable.

Urinalysis showed a few pus cells. The blood, Kahn and Mazzini reactions were negative. The erythrocyte count, hemoglobin, white blood cell count and differential count were within normal limits. Roentgenographic studies revealed the following findings: Examination of the chest disclosed the heart to be displaced moderately toward the left side. The right leaf of the diaphragm was apparently defective, and elevated to the level of the fourth rib, anteriorly. There was a collection of gas just under the diaphragmatic shadow, laterally, to the level of the fourth rib, which was assumed to be the hepatic flexure. There was a triangular area of atelectasis in the right mid-lung field, near the hilus; the lungs were otherwise clear (Fig. 1). Further study was indicated in order to determine the source of the abnormality noted in the lower aspect of the right lung. Examination immediately after a barium enema confirmed the presence of the hepatic flexure, high up in the right chest. In the filled state, it reached to the level of the second rib. The ascending colon and part of the transverse colon had herniated into the right chest. It was noted also that barium was administered by mouth. The esophagus appeared essentially normal, except for the lower portion, which was displaced toward the right, and the gastric mucosa was clearly demonstrated in the herniated mass. The distal portion of the duodenum and jejunum were displaced medially; the left lung was clear; the trachea well demonstrated, and the main bronchi appeared essentially normal, except for minimal displacement to the left (Fig. 2).

The preoperative diagnosis was traumatic right diaphragmatic hernia with the right colon and stomach herniated into the right pleural cavity. We did not suspect the herniated liver.

Operation was performed under sodium pentothal induction and intratracheal nitrous oxide oxygen and ether anesthesia, on March 8, 1951. With the patient in the right lateral position, a curving incision was made along the course of the right eighth rib, from the sacrospinalis muscles posteriorly to the costochondral cartilage anteriorly. The periosteum was raised from the eighth rib, which was resected, and the pleural cavity entered through its bed. The rib spreader was inserted and gradually opened until an adequate exposure was obtained. The entire liver, the ascending and transverse colon, and the stomach were in the lower right chest compressing the lower and middle lobes of the lung. These structures had herniated into the chest through a 20 cm. radial oval opening in the posterior, medial leaf of the dome of the right diaphragm. The colon was slightly distended. The stomach, duodenum, liver and gallbladder appeared normal. The liver was rotated so that the inferior surface faced upward and anteriorly. The inferior vena cava was deflected posteriorly and medially. A few adhesions at the diaphragmatic opening were readily separated by passing the finger around the aperture. The stomach and colon were easily reduced, but after an earnest effort, it was found necessary to enlarge the opening about 4 cm. in order to replace the liver into the abdominal cavity. The phrenic nerve was crushed about 5 cm. above the diaphragm. Despite the relaxation induced by crushing the phrenic nerve, it was seen that the opening at the center would be under considerable tension when closed. By starting at each end of the diaphragmatic opening and suturing toward the center, using figure of "8" sutures of No. 0 cotton, the edges of the diaphragm were approximated nicely, apparently without tension. A mushroom catheter was brought out through a stab wound between the ninth and tenth ribs in the posterior axillary line, and attached to a simple water trap. The lung was re-expanded by positive pressure. The chest was closed in layers, using interrupted sutures of No. 2 chromic to hold the ribs together. The muscles were approximated in two layers with interrupted sutures of No. 1 chromic catgut. Bronchoscopic aspiration was performed at the end of the operation. During the operation the patient received 1000 cc. of whole blood.

The postoperative course was uneventful. The patient was allowed up on the third day following the removal of the catheter to the water trap. The wound healed by primary union. He was discharged from the hospital after two weeks, and resumed his normal activities at the end of two months. His former symptoms were completely relieved.

The six weeks postoperative roentgenogram revealed the following: Examination after administration of barium by mouth and by barium enema now showed the stomach to have been replaced into its normal position. The duodenum revealed no abnormality and the position of the colon was now considered entirely normal. It was noted that the right leaf of the diaphragm was still slightly elevated, and that the dome was on a plane with the tenth rib, posteriorly.

those herniae on the left. I am in full accord with the following quotation of Dr. River: "Closing a diaphragmatic hernia through the abdomen is like shingling a roof from the attic."²⁰ The writer has a strong preference for the transthoracic approach because it affords a wide and easy exposure of the diaphragm, and of the

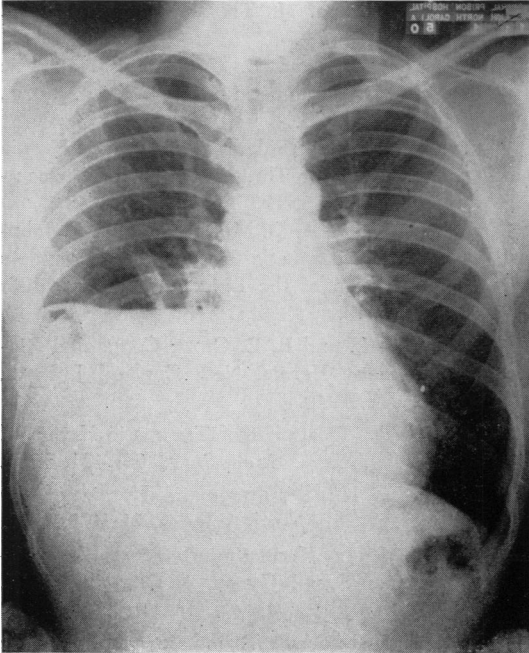


FIG. 1

FIG. 1.—This film suggests that the diaphragm is defective and elevated to the level of the fourth rib, anteriorly.

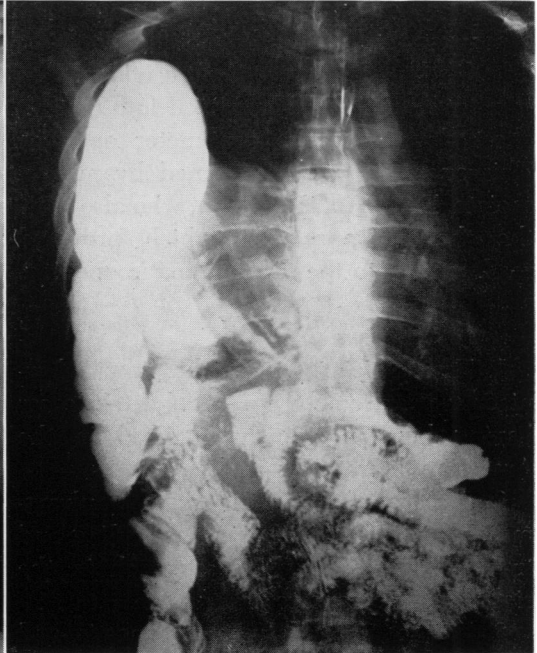


FIG. 2

FIG. 2.—This confirms the suggestion of Figure 1 and shows the barium filled hepatic flexion at the level of the second rib.

COMMENT

Although no typical clinical syndrome is apparent in a traumatic diaphragmatic hernia, this case serves to illustrate many of the findings frequently associated with this condition. Errors in diagnosis are not uncommon, but can usually be avoided by the proper use and interpretation of roentgenograms.

Most surgeons are in agreement with the thoracic approach for repair of right diaphragmatic herniae, but there are many who still use the abdominal approach for

herniated viscera. Adhesions which are often present can be freed more readily under direct vision. Approach from below, through the abdomen, will frequently necessitate much blind dissection. From above, the opening in the diaphragm can be closed accurately without fear of damaging the great vessels and esophagus. The phrenic nerve is easily accessible for crushing during the operation. The nerve should be crushed for temporary interruption in all cases, because it puts the diaphragm at rest and facilitates closure of the opening

as well as aids in healing. Even interruption of the phrenic nerve will not relax the diaphragm sufficiently for repair of some large defects in the diaphragm. In such cases, Harrington⁴ has recommended resection of the lower ribs at the angles by thorocoplasty.

This represents the second case of traumatic diaphragmatic hernia repaired in the Prison Hospital within two months. The other occurred through the dome of the left diaphragm from a bullet injury. The transverse colon had herniated into the left chest through a five centimeter opening. This operation was performed by my associate, Dr. Alfred Hamilton, who also used the thoracic approach, which provided ready access to the diaphragmatic opening.

SUMMARY

1. Traumatic right diaphragmatic herniae are extremely rare, only ten cases having been previously reported in the American literature.

2. A case of traumatic right diaphragmatic hernia with the liver, ascending and transverse colon and the stomach in the right chest is reported.

3. The clinical features, diagnostic and surgical management are discussed.

4. The writer advocates the transthoracic approach for repair of herniae through the dome of the diaphragm.

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