BLIND SUPRADIAPHRAGMATIC THORACIC DUCT CYST

CASE REPORT*

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THE OCCURRENCE OF a supradiaphragmatic thoracic duct cyst is rare, though cysterna chyli cysts are not uncommon. The latter, however, are almost invariably subdiaphragmatic. To date, the only report to be found in the literature of a thoracic duct cyst diagnosed during life, was by Emerson.[2] Three thoracic duct cysts found at postmortem examination have also been reported. The previously reported cases were all aneurysmal dilatations of the thoracic duct, none of them being a blind, supradiaphragmatic, thoracic duct cyst, as was found in the case reported here.

Carbone,[1] in 1892, described the first case of supradiaphragmatic thoracic duct cyst, which was found accidentally at the autopsy table. The cyst was at the level of dorsal spine 10 to 11, and contained milky fluid.

Priesel[4] described the occurrence of two thoracic duct cysts in the upper half of the duct in a 76-year-old female who died of pyloric and thyroid carcinoma. The walls of the cysts were extremely thin and smooth, and showed intimal thickening and calcification on microscopic examination.

Kelbling[3] described multiple aneurysmal cystlike dilatations, unilocular and multilocular, found at the postmortem examination of a 71-year-old female who died of heart disease. On microscopic examination, these cysts showed intimal thickening, with calcification and atheromatous degeneration. Although the thoracic duct was obliterated, Kelbling noted the absence of lymph stasis, presumably due to the formation of adequate anastomotic channels.

Emerson's case was the first to be diagnosed antemortem and treated surgically. In his case, as in the one reported here, it is interesting to note that the cyst continued to refill with chyle, which welled up from a duct which could be demonstrated to be coming from beneath the diaphragm.

CASE REPORT

History. The patient (Adm. #634871) was a 42-year-old white male butcher, who entered the hospital complaining of sharp left upper quadrant pain, occurring 1 to 2 hours after meals, and relieved by milk and bicarbonate of soda. The pains were always aggravated, and occasionally precipitated by the ingestion of food. It was not affected by positional change, cough, or forced respiration, and strongly suggested ulcer pain.

In 1942, the patient had a "lung infection" for 3 months, which was characterized by low-grade fever, and cough which was productive of purulent blood-flecked sputum. The patient was well and without cough or expectoration following the original episode, save for one minor episode of hemoptysis in 1945.

Routine chest roentgenograms taken in the outpatient clinic revealed the presence of a right-sided mediastinal mass, for which the patient was admitted to the thoracic surgical service.

Physical examination revealed a well-developed, well-nourished, muscular white male, in no acute distress. Temperature was 99.4° F., pulse was 76, and respiratory rate was 20; blood pressure was 160 mm. Hg. systolic and 90 diastolic. Fundoscopic examination was negative. Examination of the head and neck revealed no abnormalities. The lungs were clear to percussion and auscultation, the mass being undetectable by physical examination. The heart was normal, and the rhythm was regular. Abdominal examination revealed a smooth and non-tender

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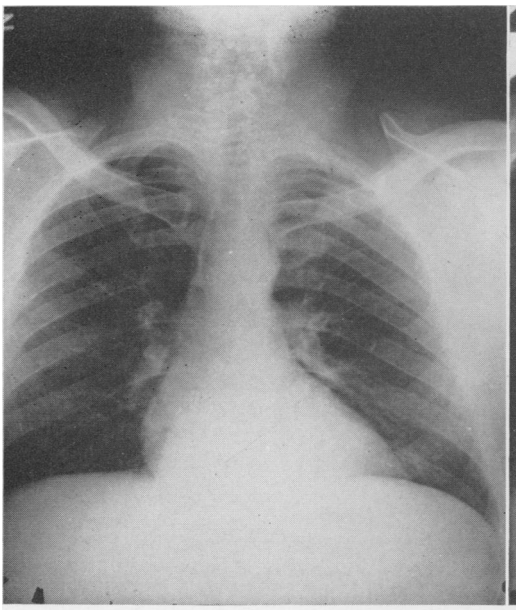

FIG. 1

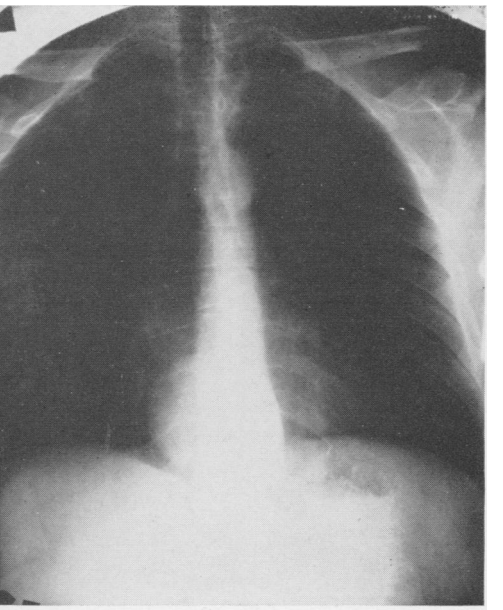

FIG. 2

FIG. 1. Routine P. A. roentgenogram of the chest barely reveals a rounded density behind the right auricular shadow of the heart. The density represents the supradiaphragmatic posterior mediastinal cyst.

FIG. 2. An overexposed roentgenogram more clearly demonstrates the cyst, and helps to differentiate it from the overlying cardiac shadow.

liver, which was enlarged to 3 fingerbreadths below the right costal margin. No other organs or masses were palpable. Rectal and genital examinations were negative.

Laboratory examination of the blood revealed: hemoglobin, 15 Gm.; white blood count, 7,500, with 62 per cent segmented neutrophiles, 1 per cent non-segmented forms, 35 per cent lymphocytes, and 2 per cent eosinophiles. The sedimentation rate was 5 mm. per hour. The urine was normal except for a one plus albuminuria, and the serology was negative. The blood urea nitrogen was 17 mg. per cent; fasting blood sugar was 80 mg. per cent; total protein was 7.2 Gm. per cent with an albumin-globulin ratio of 4.6/2.6; bilirubin was 0.2 mg. per cent; van den Bergh was negative; alkaline phosphatase was 7 King-Armstrong units, and the cephalin flocculation was 1 plus. The electrocardiogram revealed a small Q wave in AVF, but was without definite abnormality.

Chest roentgenogram revealed a rounded density with smooth contours within the cardiac shadow, just above the diaphragm on the right (Fig. 2). Tomograms of the lower mediastinum and hilar region demonstrated the mass very well. There was no evidence of pulsation, cavitation, or calcification. Above the mass, to the right of the spine, in the region of the lower portion of the right hilum, there appeared to be a moderately well-demarcated hemispherical homogeneous shadow, of lesser density than the mass previously described. On the planigram, taken 4½ inches from the back, the pulmonary vessels appeared to be continuous with this shadow, which therefore may have represented dilated pulmonary vessels, although the possibility that it was a second mass, adjacent to the one below, could not be excluded. Examination of the esophagus revealed the lowermost 3 inches to be displaced forward and to the left, by the spherical mass in the posterior mediastinum (Fig. 4). There was no evidence of an intrinsic lesion of the esophagus. There was no evidence of a communication between the esophagus or the stomach and the mass (Fig. 3). The region of the cardia was elevated in a somewhat triangular, tent-like fashion, which represented a small hiatus hernia. There was no evidence of an intrinsic organic lesion of the stomach. The duodenal bulb appeared to be complete, although its folds were somewhat prominent.

The preoperative diagnosis considered most strongly was a mediastinal cyst, either bronchiogenic or enterogenous.

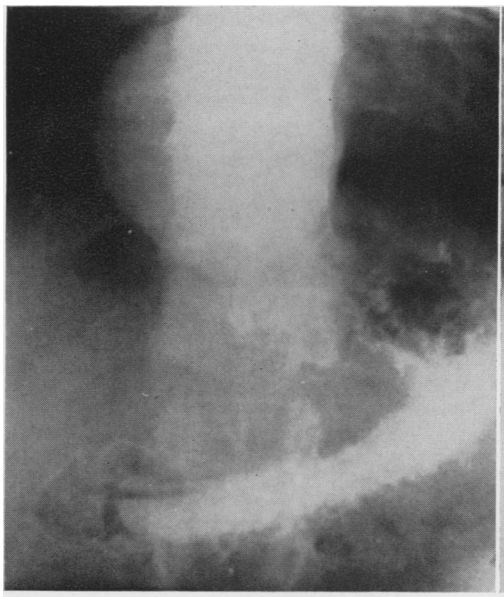

FIG. 3

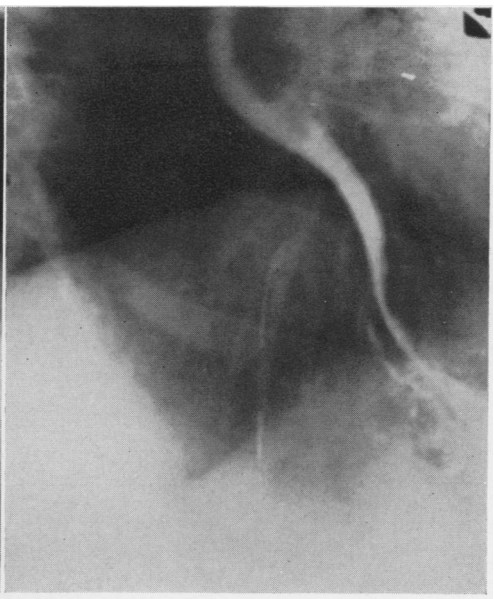

FIG. 4

FIG. 3. Barium swallow demonstrates no connection between the cystic structure and the gastro-intestinal tract.

FIG. 4. An oblique projection demonstrates the position of the cyst in the posterior mediastinum. There is a displacement of the esophagus anteriorly and to the left by this tumor.

On December 26, 1951, a right exploratory thoracotomy was performed, with the patient in the left lateral decubitus position. The eighth rib was excised, and the right pleural cavity was entered through its bed. In the posterior mediastinum, just above the diaphragm, a cyst, measuring 6 cm. by 8.5 cm., was found. The overlying mediastinal pleura was incised, and the cyst was easily mobilized, using blunt and sharp dissection. A pedicle was found at its inferior aspect, which extended behind the posterior portion of the diaphragm. The cyst was opened, and found to be filled with thin, milky fluid, which was seen to well up through a small opening at the inferior aspect of the cyst. This opening was probed, and found to extend for a distance of at least 4 cm. below the diaphragm. The pedicle was clamped, and suture ligated, after which the cyst was excised. The mediastinal pleura was closed over the pedicle stump, a soft rubber tube catheter was inserted through a stab wound in the posterolateral aspect of the tenth interspace, and the thoracotomy wound was closed in the usual manner, with interrupted silk sutures.

Upon gross examination, the specimen was described as the wall of a collapsed cyst, the external aspect of which was covered by hemorrhagic connective tissue. The internal aspect presented a peculiar granular and nodular appearance, grayish tan in color, with many areas presenting an unusual folded appearance. At one end, a suture was found around what was stated to be the pedicle. Microscopically, the cyst showed no specific lining. The inner two-thirds of the wall was composed of rather acellular connective tissue; the outer portion was composed predominantly of muscle tissue, with a small amount of elastic tissue. The histology was compatible with the structure of the thoracic duct.

Culture of the chylous fluid revealed *B. Coli* and enterococcus. Chemical examination of the cyst fluid revealed the following: specific gravity 1.0175; sugar, 140 mg. per cent; cholesterol, 80 mg. per cent, with esters of 60 mg. per cent; proteins, 3.8 Gm. per cent. The fluid took a Sudan III stain, but examination for neutral fat was not done.

The postoperative course was uneventful and the patient was discharged on the tenth postoperative day. It is interesting to note that at the routine two months' postoperative follow-up examination the patient continued to complain of his original left upper quadrant pain.

SUMMARY

During the routine examination of a patient complaining of upper abdominal pain a mediastinal tumor was found on the chest

roentgenogram. At exploratory thoracotomy a supradiaphragmatic thoracic duct cyst was found. It originated from a duct which entered the thorax from behind and below the diaphragm. Superiorly the cyst ended blindly. It contained chylous fluid which continued to pour from the duct during the surgical removal. The histological examination of the cyst wall showed it to be compatible with the structure of the thoracic duct. The patient made an uneventful postoperative recovery, but his original abdominal symptoms persisted.

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