was a clue that it, too, was falsely positive.[11] With borderline and weakly reactive FTA-ABS results, Sparling recommended repetition of the test and further confirmation with a TPI. Absorbing the test serum with an extract of whole Reiter treponeme can eliminate some false positives. Mackey et al used this modification to establish false positive FTA-ABS results in four of five problem cases.[11] In this case the non-reactive FTA-ABS nine months later finally negated the possibility of syphilis.

The patient's history in the present case was also difficult to perceive. When the VDRL and FTA-ABS were reactive (January), questions dealing with his sexual activity led to a list of fictitious contacts. While this story covered his addiction, it deceived his physician into treating him for syphilis and obliged the Health Department to undertake a useless search for contacts.

We cannot speculate on the mechanism by which narcotic addiction causes falsely reactive tests for syphilis. This case suggests a temporal relation between heroin usage and false serologic reaction.

Summary

Reactive VDRL and FTA-ABS tests led to treatment for syphilis in a 20-year-old heroin addict. He contrived a history that provoked a useless search for contacts. Further testing showed that each result was falsely positive.

REFERENCES

1. Boak RA, Carpenter CM, Miller JN: Biologic false positive reactions for syphilis among narcotic addicts. JAMA 175:326, Jan 1961

2. Harris WDM, Andrei J: Serologic tests for syphilis among narcotic addicts. New York J Med 67:2967-2974, Nov 1967

3. Harris AD, Brown L, Portnoy J, et al: Narcotic addiction and BFP reactions in tests for syphilis. Publ Hlth Rep (Wash) 77:537-543, Jun 1962

4. Cherubin CE, Millian SJ: Serologic investigations in narcotic addicts—I. Syphilis, LGV, herpes simplex, and Q fever. Ann Int Med 69:739-742, Oct 1968

5. Sparling PF: Diagnosis and treatment of syphilis. N Engl J Med 284:642-653, Mar 1971

6. Kraus SJ, Haserick JR, Lantz MA: Atypical FTA-ABS fluorescence in lupus erythematosis patients. JAMA 211:2140-2141, Mar 1970

7. Buchanan CS, Haserick JR: FTA-ABS test in pregnancy—A probable false-positive reaction. Arch Derm (Chicago) 102:322-325, Sep 1970

8. Cohen P, Stout G, Ende N: Serologic reactivity in consecutive patients admitted to a general hospital—A comparison of the FTA-ABS, VDRL, and automated reagin tests. Arch Int Med (Chicago) 124:364-367, Sep 1969

9. Hughes MK, Fusillo MH, Roberson BS: Positive fluorescent treponemal antibody reactions in diabetes. Appl Microbiol 19:425-428, Mar 1970

10. Apparent transient false-positive FTA-ABS test following small pox vaccination. J Okla State Med Assoc 64:372, Sep 1971 (No author listed for this report)

11. Mackey DM, Price EV, Knox JM, et al: Specificity of the FTA-ABS test for syphilis—An evaluation. JAMA 207:1683-1685, Mar 1969

12. Bradford LL, Tuffanelli DL, Puffer J, et al: Fluorescent treponemal absorption and Treponema pallidum immobilization tests in syphilitic patients and biologic false-positive reactors. Am J Clin Path 47:525-532, Apr 1967

Refer to: Leeds SE, Benioff MA, Ortega P: Pulmonary lymphangiomyoma with renal angiomyolipomas—Calif Med 119:74-78, Aug 1973

Pulmonary Lymphangiomyoma with Renal Angiomyolipomas

SANFORD E. LEEDS, MD
MORTIMER A. BENIOFF, MD
PAUL ORTEGA, MD
San Francisco

LYMPHANGIOMYOMA IS A RARE DISEASE of the lymphatic system in which smooth muscle cells of the walls of the lymphatic vessels proliferate in the lung, mediastinal and retroperitoneal tissues. It is apparently benign, since metastasis has not been reported, but it may cause fatal pulmonary insufficiency. Cornog and Enterline[1] reported six cases of their own and collected 14 from the literature. They listed the following terms used to characterize this group of cases: lymphangioma, lymphangiomyoma, lymphangiopericytoma and leiomatosis. They favor the term lymphangiomyoma, as does Pamukcoglu.[2]* Cornog and Enterline described both a diffuse form of the disease and one which is localized to the mediastinum or retroperitoneum. Since their report of 20 cases, reports of nine more cases have appeared in current medical journals available.[2-10] To the best of our knowledge the present case is the thirtieth.[11]

Although the lesion is rare, new cases are being reported with greater frequency. Early diagnosis may aid in stimulating the development of new forms of treatment and in improvement in the poor prognosis of the diffuse form of the disease. The patient whose case is reported here had renal lesions (angiomyolipomas) such as have been reported in one other patient with lymphangiomyoma and not uncommonly with tuberous sclerosis.

From the Departments of Surgery, Medicine and Pathology, Mount Zion Hospital and Medical Center, San Francisco.

Submitted August 25, 1972.

Reprint requests to: S. E. Leeds, MD, Mount Zion Hospital and Medical Center, P.O. Box 7921, San Francisco, CA 94120.

*One reviewer of the manuscript considered lymphangioleiomatosis a better term since lymphangiomyoma suggests a localized tumor.

Report of a Case

The patient, a woman 37 years of age, was well until August 1964 when, after giving birth to her second child, she began to have shortness of breath and to tire easily. In July 1965, a respiratory infection associated with fever and cough developed. The cough and fever subsided, but she had persistent mild shortness of breath. An x-ray film of the chest taken at this time showed a small left pleural effusion. There were increased linear markings with a reticular pattern suggestive of honeycombing throughout the lower half of the right lung field and the lower two-thirds of the left lower lung field. No diagnostic studies of this pleural effusion were performed. By September 1965, the effusion had decreased and it then remained stable for several months.

The patient was first admitted to this hospital in June 1966, with shortness of breath, a slight cough and roetgenographic findings of an increased pleural effusion. She specifically denied chest pain, sputum production, fever and hemoptysis. Her weight was stable. The physical examination was unremarkable except for evidence of left pleural effusion.

On thoracentesis 450 ml of chylous fluid was withdrawn from the left side of the chest. The fluid contained 2,290 leukocytes per cu mm, of which 52 percent were filamented and 48 percent were lymphocytes. Total lipid content was 2,170 mg per 100 ml. Cultures of the fluid were negative for tuberculosis and fungi. A skin test with intermediate purified protein derivative was positive while histoplasmin and coccidioidin skin tests were negative. The patient was discharged without determination of the cause of the chylous pleural effusion.

For a time afterward shortness of breath lessened somewhat and the patient had no particular complaints until February 1967, when increased fatigability and shortness of breath again recurred coincident with a further increase in pleural fluid.

Early in March 1967 she was readmitted to the hospital and 1,000 ml of milky fluid was aspirated from the right side of the chest. The fluid reaccumulated and on March 27 another 1,000 ml of fluid, milky and pinkish, was removed. Physical examination and laboratory studies again were within normal limits except for the finding of left pleural effusion. There were no neurological signs or symptoms. Supraclavicular and femoral lymph node biopsy showed only mild fibrous scarring. An exploratory thoracotomy was advised for definite diagnosis and for control of the recurrent chylothorax.

Right postero-lateral thoracotomy was performed through the bed of the resected seventh rib. The right lung had a uniform cobbled surface (Figure 1) due to innumerable subpleural blebs. The pleural cavity contained about 1,000 ml of milky fluid. The mediastinal pleura was carefully examined and no chyle leak was found. The mediastinal pleura was opened between the diaphragm and the azygous vein and biopsy specimens were taken of the thoracic duct, which showed extensive intramural invasion by spindle-shaped cells (Figure 2). Approximately 3 to 4 cm above the diaphragm were two large succulent,

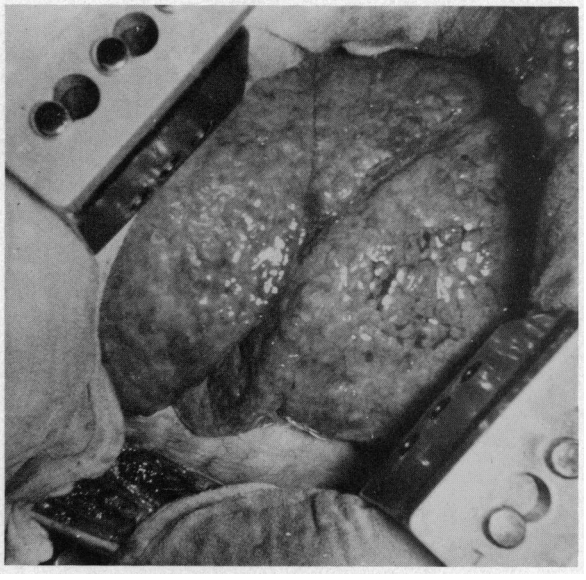

Figure 1.—Cobbled appearance of the right lung seen at operation. The nodules are formed by numerous small emphysematous cysts.

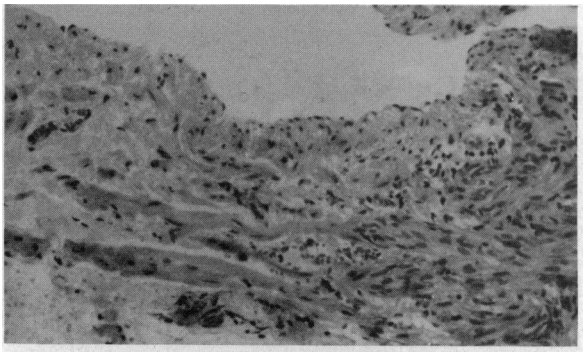

Figure 2.—Lumen of thoracic duct is lined by a thin endothelium. Encroaching cells in lower field of photograph are growing within the muscle layers as solid sheets of spindle cells. (125 ×. Hematoxylin and eosin stain.)

reddish-purple posterior mediastinal lymph nodes and these were removed for histologic examination. Finally, a biopsy specimen of the right middle lobe was taken before the chest was closed.

The patient continued to have respiratory distress and her condition progressively deteriorated because of respiratory insufficiency. She died ten weeks after operation.

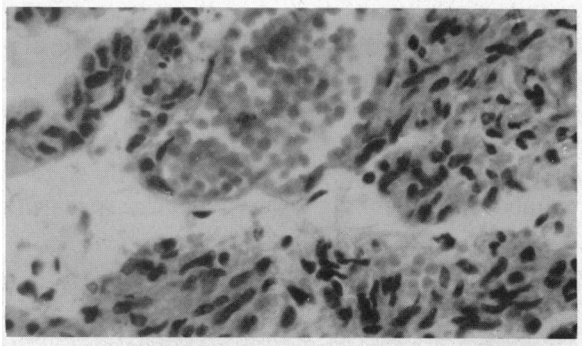

Figure 3.—Clusters of cells growing along pulmonary alveolar septa and around smaller pulmonary vessels. There has been a local total replacement of normal pulmonary tissue. (310 X. Hematoxylin and eosin stain.)

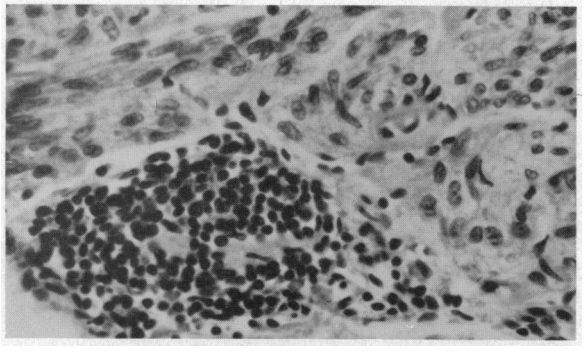

Figure 4.—Almost total replacement of mediastinal lymph node by spindle-shaped cells. Only a single residual collection of small lymphocytes is present. The infiltrating cells appear either elongate or circular, depending on angle of sectioning. (310 ×. Hematoxylin and eosin stain.)

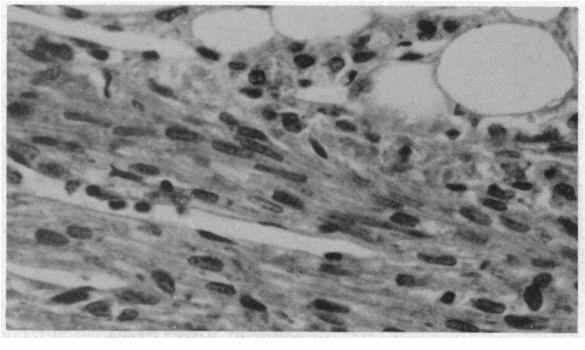

Figure 5.—Renal tumor composed of elongate cells admixed with mature fatty elements. There is a paucity of mitoses. (310 ×. Hematoxylin and eosin stain.)

Pathologic findings. The pleural cavities were almost completely obliterated by dense adhesions. There was a semiloculated collection of approximately 500 ml of a cloudy brownish fluid on the right.

The left lung weighed 800 and the right 900 grams. Innumerable small blebs covered the surface of the lungs, and cut sections of the lungs showed sponginess consistent with a multiplicity of small cysts. There was some focal interstitial condensation of tissue between the cysts, while the hilar structures and lymph nodes were grossly normal.

The heart weighed 260 grams. The left ventricle was normal while the right ventricle was decidedly dilated and contained an apical mural thrombus.

The kidneys were normal in size and configuration but within the cortex there were several small encapsulated white nodular masses which measured up to 1.5 cm in diameter.

The thymic region was unremarkable. Immediately anterior to the abdominal aorta there were several aggregations of a pinkish white tissue.

Permission to examine the brain was not given.

Histological findings. The alveolar structure (Figure 3) was distorted by an admixture of atelectasis and cystic transformation (honeycombing) interspersed with solid fascicles or sheets of cells which were spindle-shaped and contained abundant cytoplasm and slender regular nuclei. Mitoses were rare. Tumor infiltration showed a predilection for lymph nodes, for hilar lymphatic vessels (which were dilated), for pleural surfaces and for interlobular septa. There was a striking tendency toward formation of nodular tumors. The pulmonary parenchyma was extremely edematous and congested with areas of recent bleeding. The tissue from the left lower lobe contained many emboli and evidence of infarction.

Many lymph nodes from the chest and abdomen demonstrated a partial or complete replacement by spindle-shaped cells (Figure 4). These changes were especially pronounced in the retroperitoneal nodes about the celiac axis. The pink masses of tissue anterior to the abdominal aorta were lymph nodes which were massively replaced by proliferating bundles of spindle-shaped cells.

The renal cortical lesions were also composed of similar spindle cells plus mature fat cells, giving them the appearance of angiomyolipomas (Figure 5).

TABLE 1.—*Classification of 30 Cases of Lymphangiomyoma*

		No. of cases
I.	Diffuse lymphangiomyoma involving lungs, usually with mediastinal and retroperitoneal lymph nodes (nine of these cases also had lymphangiomyomatous masses in mediastinum or retroperitoneum)	18
II.	Diffuse lymphangiomyoma in the posterior mediastinum or retroperitoneum or both without lung involvement	1
III.	Circumscribed lymphangiomyoma in	
	(a) mediastinum	7
	(b) retroperitoneum	0
	(c) both mediastinum and retroperitoneum	1
IV.	Lymph node in	
	(a) mediastinum	2
	(b) retroperitoneum	1
	(c) both mediastinal and retroperitoneal	0
	TOTAL	30

Note: The only male was in Group III-c.[13]

In summary, autopsy findings showed diffuse smooth muscle cell proliferation with a multifocal distribution in lung, mediastinum and retroperitoneum. Severe generalized pulmonary alveolar septal involvement was associated with cystic transformation (honeycomb lung), pulmonary and pleural fibrosis and right ventricular hypertrophy. Some nodes were only partially infiltrated with spindle-shaped cells, suggesting an earlier stage of involvement.

Comments

Recent reviews and case reports have described in detail the varied clinical and pathologic features of diffuse lymphangiomyoma[1-11] with emphasis on the association of chylothorax, honeycomb lung and posterior mediastinal and retroperitoneal lymph node infiltration with smooth muscle cells. A striking sex incidence (29 of the 30 reported cases were in women) suggests that hormones may have a place in the treatment of the disease. In fact hormones were used in one case.[8]

The most common roentgenographic finding is pleural effusion, which may be unilateral but is frequently bilateral. On thoracentesis chylous fluid is obtained. Spontaneous pneumothorax occurred in one-fourth of the patients. The lungs show a fine reticulonodular interstitial infiltrate distributed diffusely and uniformly throughout the lung fields. At a more advanced stage small cysts are formed, giving the appearance of "honeycomb" lungs.[11] With publication of the paper of Laipply and Sherrick[12] in 1958, this disease entity became more clearly distinguishable from the relatively more frequently occurring smooth muscle hyperplasia of the lung (honeycomb lung) associated with chronic pulmonary infection or granulomatous disease. Cornog and Enterline[1] described the pathologic changes in detail and considered the lesion a hamartoma, often of multifocal origin. The lesions in the lungs and mediastinum bear a striking resemblance to lesions found in certain cases of tuberous sclerosis. However, there is only one report[6] of tuberous sclerosis of the brain in a patient with lymphangiomyoma.

The 29 cases reported to date,[1-10] and the present case fall into four groups (Table 1) when classified by pathologic findings. In some cases the information about the patient is incomplete and therefore classification cannot be exact. It is possible, as Bush et al[8] have pointed out, that the diffuse disease (Group I and II) is a different disease entity from localized disease (Group III and IV). Group I is characterized by muscular disease of the lung frequently accompanied by chylothorax, and by a peculiar type of mediastinal or retroperitoneal lymph node involvement. Eighteen of the reported cases are in this category, and in nine of them there were also lymphangiomyomatous masses in the mediastinum or retroperitoneum. The single patient in Group II had diffuse involvement of the retroperitoneum without involvement of the lung. Groups III and IV include the cases in which the lesions are encapsulated or are in isolated lymph nodes in the mediastinum or retroperitoneum. Such cases may be treated curatively by surgical extirpation. The only case in a male was in Group III(c).

There were 12 patients in Groups II, III and IV. One had died, eight had been living for from one to fourteen years at the time of report, and the outcome was not mentioned in two. The single known death in Groups II-IV was in the only male patient; it occurred after development of bilateral pneumonia thought to be due to aspiration of fluid.[13] However, diffuse pulmonary infiltrate had been present before the operation, and after operation roentgenographic evidence of interstitial pneumonitis developed. An alternative interpretation is that the pulmonary disease was secondary to lymphangiomyoma rather than to aspiration.[1]

Of special interest in the present case were the renal cortical tumors which have been reported in one other case of lymphangiomyoma (reported by both Cornog and Enterline; Case 6, and Vadas

and coworkers; Case 3). Renal angiomyolipomata occur rarely in the general population but are not uncommon in patients with tuberous sclerosis.[14-16] This tumor is of special interest to urologists, since it may displace the pelves and calyces of kidneys and simulate a malignant tumor, or, when multiple and bilateral, may simulate conditions associated with polycystic kidneys.

Summary

A case of diffuse lymphangiomyoma, believed to be the thirtieth of record, is reported. Characteristic features of the disease are its predilection for women; occurrence in a localized form which is curable by complete surgical excision, or in diffuse form which progresses to death from cardiorespiratory failure; and onset with dyspnea, recurrent pleural effusions, spontaneous pneumothorax and chylous effusions in serous cavities. Pathologically it is considered to be a hamartoma, often of multifocal origin. Renal angiomyolipoma, reported in only one other instance, was present.

Treatment and prognosis are different for the localized than for the diffuse forms of the disease.

ACKNOWLEDGMENT

Drs. H. T. Enterline and H. Z. Klein reviewed the pathologic material and confirmed the diagnosis.

REFERENCES

1. Cornog JL Jr, Enterline HT: Lymphangiomyoma, a benign lesion of chyliferous lymphatics synonymous with lymphangiopericytoma. Cancer 19:1909-1930, Dec 1966

2. Pamukcoglu T: Lymphangiomyoma of the thoracic duct with honeycomb lungs. Am Rev Resp Dis 97:295-301, Feb 1968

3. Vadas G, Pare JAP, Thurback WM: Pulmonary and lymph node myomatosis—Review of the literature and report of a case. Can Med Assoc J 96:420-424, Feb 1967

4. Fievez M, Collard M, Godart S, et al: A propos d'um cas de lymphangiomyomatose diffuse. Ann Anat Path 12:431-440, 1967

5. Frack MD, Simon L, Dawson BH: The lymphangiomatosis syndrome. Cancer 22:428-437, Aug 1968

6. Wuketich S: Angioleiomyomatose der Lunge und der Lymphknoten. Verh Dtsch Ges Path 51:333-338, 1967

7. Maurer HJ, Koch W: Lymphographie bei einem Chylothorax auf dem Boden eines Angiomyoms. Fortschr Geb Roentgenstr Nuklearmed 103:384-387, 1965

8. Bush JK, McLean RL, Sieker HO: Diffuse lung disease due to lymphangiomyoma. Am J Med 46:645-654, Apr 1969

9. Ardichvili D, Colard M, deWindt J: Syndrome de lymphangiomyomatose. Ann Anat Path 15:307-320, 1970

10. Cabanne F, Renault R, Michiels R, et al: Lymphangiomyome ou lymphangiopéricytome. (A propos d'une néoformation pelvienne kystique infectée). Laval Med 42:431-437, May 1971

11. Miller VT, Cornog JL Jr, Sullivan MA: Lymphangiomyomatosis—A clinical-roentgenologic-pathologic syndrome. Am J Roentgenol Radium Ther Nucl Med 111:565-572, Mar 1971

12. Laipply TC, Sherrick JC: Intrathoracic angiomatous hyperplasia associated with chronic chylothorax. Lab Invest 7:387-400, 1958

13. Pachter MR, Lattes R: Mesenchymal tumors of the mediastinum—III. Tumors of lymph vascular origin. Cancer 16:108-117, Jan 1963

14. Inglis K: The nature and origin of smooth-muscle-like neoplastic tissue in renal tumors of the tuberous sclerosis complex. Cancer 13:602-611, May 1960

15. McCullough DL, Scott R Jr, Seybold HM: Renal angiomyolipoma (hamartoma)—Review of the literature and report of 7 cases. J Urol 105:32-44, Jan 1971

16. Price EB Jr, Mostofi FK: Symptomatic angiomyolipoma of the kidney. Cancer 18:761-774, Jun 1965

Refer to: Costanza DJ, Hoversten VW: Accidental ingestion of water hemlock—Report of two patients with acute and chronic effects. Calif Med 119:78-82, Aug 1973

Accidental Ingestion of Water Hemlock

Report of Two Patients with Acute and Chronic Effects

DAVID J. COSTANZA, MD
VINCENT W. HOVERSTEN, MD
San Francisco

WATER HEMLOCK is probably the most poisonous plant that grows in the United States. It is extremely toxic to livestock and to man. In two cases of severe poisoning in humans, the acute phase was manifested by convulsions, uncontrolled neuromuscular movements, respiratory distress, cardiovascular variability, and metabolic acidosis. The long-term chronic effects were electroencephalographic abnormalities and anxiety neurosis.

The toxic effects of cicutoxin in man were first recorded by Wepfer in 1679.[1] He reported several children poisoned by the Cicuta hemlock plant and noted "noncoagulation of the blood." In 1814 Stockbridge[2] reported three cases, which were the first in the United States; two of the patients died during violent convulsions. In 1911, Egdahl reviewed the literature and found reports of 47 cases in Europe and the United States.[3] The frequency of reports is now much greater and shows that cicutoxin toxicity is still a severe health hazard especially to children. Within the past two years two other reports from divergent areas of the country attest the continued danger of exposure,[4,5] and poisonings are still reported in Europe.[6] Two cases of accidental ingestion of large amounts of cicutoxin, in which the patients survived but had long-term aftereffects, are reported herein.

In 1969, five boys were hiking in the hills of

From the Marin General Hospital, Larkspur, and the Medical Service, San Francisco General Hospital, and the Department of Medicine, University of California, San Francisco.

Submitted October 27, 1972.

Reprint requests to: S. Nutter, Editorial Office, Room 4101, San Francisco General Hospital, 1001 Potrero Avenue, San Francisco CA 94110.