best form of treatment because of the associated tissue infarction caused by invasion of vessel walls and thrombotic occlusion of their lumina.

REFERENCES
1 Murphy JD, Bornstein S: Mucormycosis of the lung. Ann Intern Med 33:442, 1950

Congenital Superior Vena Cava Aneurysm with Complications Caused by Infectious Mononucleosis

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This is the fifth case report in the English literature of a superior vena cava aneurysm. The case was complicated by the fact the patient had infectious mononucleosis with a superimposed thrombophlebitis of the aneurysm caused by the infectious mononucleosis. Pulmonary emboli and infarctions resulted from the thrombus and complications of the process resulted in her death. In the four previous cases no mural thrombi were described, nor did these patients experience pulmonary emboli or pulmonary infarction.

CASE REPORT

A 20-year-old white woman college student was admitted to the hospital medical service for the first time in April 1970. The chief complaint consisted of fever of 14 days duration, pleuritic type pain in the right chest and cough of seven days duration, and a generalized body rash for six days.

The patient's illness began with fever in the range of 101-103° F (oral). Malaise was experienced, and seven days before admission she developed sharp pain in the right chest stabbing in nature, aggravated by deep inspiration, and associated with a dry nonproductive cough.

Early in the course of her illness she was seen by a physician who made a diagnosis of pneumonia and prescribed ampicillin. She failed to improve and six days after the antibiotic was started she developed a diffuse body rash which was maculopapular in type. Ampicillin was stopped. The patient failed to improve and was referred for admission to the medical service.

Past history and system review were noncontributory. The patient was athletic and participated actively in sports. No injuries had occurred. Childhood illnesses were denied. Mantoux test had always been negative, and a chest x-ray film had never been taken.

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Physical Examination

Her blood pressure was 110/50, pulse rate 90/min, respiration, 20/min, temperature, 100.8° F (oral). Essential features of the physical examination revealed the skin to be covered with a maculopapular rash. Cervical nodes of 1 to 1.5 cm were palpated in the anterior and posterior triangles of the neck. No other nodes were palpable. The thyroid was normal. The chest revealed dullness to percussion over the right base and limited movement because of splinting on the same side. Diminished breath sounds and crepitant rales were present over the right lower lung field. Decreased vocal fremitus was found over the same area. The left chest was normal. The heart was normal. Abdominal palpation revealed the liver 3 cm below the right costal margin and the spleen tip was just palpable. All pulses were normal and the neurologic examination was physiologic.

Course in the Hospital

Hemogram gave normal findings. The differential showed polymorphonuclear cells 42, atypical lymphocytes 13, lymphocytes 41, monocytes 1, and eosinophiles 3.

The atypical lymphocytes were of the Downey cell type. Sedimentation rate 48 mm per 1 hour Westergren. Mono test-positive; heterophile titer 1:448; guinea pig kidney absorption 1:224; beef RBC-negative; SCOT 225 mIV; Alkalin phosphatase 167 mIV; LDH 400 mIV; cephalin flocculation 24 hours plus, 48 hours plus; albumin 3.5 gm; globulin 3.0 gm.

Thymol turbidity, total bilirubin, fasting blood sugar, BUN, uric acid, cholesterol, calcium, phosphorus, urinalysis, febrile agglutinins, sputum culture, intermediate Mantoux, VDRL, were either within normal limits or negative.

Chest x-ray films (Fig 1A and 1B) show a large anterior superior mediastinal mass, associated with a right pleural effusion. Tomography in the anteroposterior and lateral views gave no additional information. The esophagus was not displaced, and the trachea is in the midline. Barium swallow was normal. An 131I thyroid uptake and scan was normal, as was an IVU. Liver scan revealed a normal sized liver and an enlarged spleen. A radioisotope isotope angiogram suggested the mass might be vascular, but located fluid could not be ruled out. Needle puncture of the mass was therefore contraindicated. Repeated electrocardiograms were negative.

A thoracentesis was done, but only 10 ml of a deep straw-colored fluid could be obtained. The protein content was 4.6 gm. The fluid revealed 270 WBC per cu mm. Several atypical lymphocytes of the infectious mononucleosis type were seen. Cultures were negative for bacteria and fungi.

The question of surgical exploration arose. The medical service argued against this for the following reasons. Infectious mononucleosis had been proved and the patient was improving. Although ECG's were negative, myocarditis is always a distinct possibility in such cases and this, together with proved liver abnormalities, makes for increased anesthesia risk. The nature of the mass had not been proved and it was believed this should be ascertained before surgery. A two week waiting period was suggested at the end of which time, if the mass persisted, angiography would be done.

The patient was transferred to the surgical service on the seventh hospital day at the request of her parents and a thoracotomy was performed the following day. Upon opening the right chest wall a large mass presented which seemed attached to the mediastinum; the mass was palpated carefully. It did not pulsate and felt semi-solid and not like a lymphoma. All lobes of the right lung revealed multiple...
Figure 1A (left). Chest x-ray film in P-A position demonstrating anterior superior mediastinal mass and pleural effusion in right chest cavity. Figure 1B (right). Chest x-ray film in right lateral position demonstrating anterior superior mediastinal mass and pleural effusion in right chest cavity.

nodular areas, some of which were more indurated than others. During palpation of the mass the patient suddenly became cyanotic. The heart continued pumping, but soon stopped. Cardiac massage was immediately instituted and the patient responded for a short time. The cyanosis deepened and the heart stopped. Resuscitation failed.

At autopsy, a 9 cm aneurysm of the superior vena cava was found with a mural thrombus and a 1 cm calcific plaque (Fig 2). The Masson's trichrome stains revealed the congenital nature of the aneurysm by the absence of the longitudinal muscular coat of the adventitia. The superimposed infectious mononucleosis caused a thrombophlebitis of the aneurysm with the resulting multiple pulmonary infarcts and embolus of the left lower lobe branch of the pulmonary artery.

The liver, lymph nodes, spleen, heart and lungs showed typical infectious mononucleosis pathology. The myocardium also showed focal collections of eosinophiles.

Discussion

We are accustomed to thinking of aneurysms in connection with arteries only, and fail to realize that aneurysms of large veins do exist, the superior vena cava aneurysm being one of the rarest. In the English language literature, only four cases have previously been reported. This case was disturbing because the patient had proved infectious mononucleosis and chest pathology by x-ray film consistent with this diagnosis.

The aneurysm was congenital in nature and the fact that it contained a calcific plaque on gross examination is evidence that it had been present for some time. In view of atypical lymphocytes of the mononucleosis type cells in the wall of the aneurysm, it is apparent that the infectious mononucleosis caused a thrombophlebitis in the wall of the aneurysm that resulted in pulmonary emboli and infarcts. No mural thrombi were observed in previous cases reported in the literature.

Venography in all mediastinal masses of this nature is important in order to arrive at the proper diagnosis. In the four previous cases reported this procedure was only carried out in two. Dilatation of the azygos vein can simulate a superior vena caval aneurysm radiologically, but venography will make this apparent.

Changes in size and shape in the supine and upright
Aortic Valve Replacement for Candida Endocarditis

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A patient with Candida endocarditis treated by aortic valve replacement is presented. A combination of vigorous medical treatment and early surgical intervention has resulted in survival of four of five patients with this disease. Results of medical therapy alone have been poor.

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