Large Thymic Tumor Simulating Pericardial Effusion

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A case of a 20 year old man with a large thymic tumor simulating a pericardial effusion is reported. This tumor, by its position, size and "fluidity," mimicked a pericardial effusion so well that it was only at surgery that a definitive diagnosis could be made. Upon removal of the mass recovery has been complete.

This single case of a mediastinal tumor is reported because the tumor surrounded the heart and by its location and shape closely simulated a pericardial effusion. Since mediastinal tumor is not often considered in the differential diagnosis of what is apparently an enlargement of the cardiac silhouette itself, this case should serve as a stimulus to more inclusive diagnostic thinking.

CASE REPORT

A 20 year old Negro male, a grocery clerk, was first seen on Aug. 29, 1949. About six weeks before this, the patient had had a routine chest x-ray film made when he applied for a food handler's certificate of health. He was told that he had fluid around his heart and would require hospitalization. He was then sent to the Newark City Hospital where he was observed for 27 days. While hospitalized, attempts to aspirate "fluid" were unsuccessful, and surgery to remove the "fluid" was proposed. The patient, however, refused and left the hospital to go under the care of his private physician.

The patient had been entirely asymptomatic. His appetite was good and there had been a weight gain of 7 pounds in the past year. There had been no chest pain, no cough, no dyspnea, no fever, no night sweats, no expectoration or hemoptysis and no weakness nor loss of strength. He worked daily as a grocery clerk and delivery boy.

The family history was not remarkable. The patient had lived in Florida until 1946 and was in good health except for a "mild" attack of pneumonia at the age of 10 years. The history suggested asthma at 15 years of age.

Physical Examination. The patient was a thin Negro man, 5 feet 8 inches tall, weighing 119 pounds, without dyspnea, orthopnea, or cyanosis. Examination of the eyes, ears, nose and throat showed no significant abnormality. The neck veins were not distended. There was no thyroid enlargement nor lymphadenopathy. The precordium showed no bulge. There was bilateral gynecomastia. The area of cardiac dullness was increased to the right and left on percussion. Heart sounds were distant and varied when the patient was changed from the upright to the recumbent position, being somewhat louder in the recumbent than in the upright position. The rhythm was regular with a pulse and ventricular rate of 80 per minute. The blood pressure was 110/70 in both arms. There were no significant changes in auscultation or percussion of the lungs. Abdominal examination revealed no masses or palpable viscera. There was no ascites or pitting pretibial edema. Rectal examination, including a sigmoidoscopic investigation, failed to reveal any pathologic changes. Neurologic examination was within normal limits. The genitalia were those of an apparently normal adult male.

X-ray of the chest showed a roughly triangular density obscuring the normal cardiac shadow. The apex of the triangle was at the manubrium of the sternum, and the sides sloped downward and laterally to reach the left lateral chest wall at the level of the eighth rib on the left and almost to reach the lateral chest wall on the right. On the lateral view, the density had a posterior border which sloped downward and posteriorly reaching to the posterior chest wall. Anteriorly the mass extended upward along the anterior chest wall reaching almost as high as the manubrium. No pulmonary infiltration was seen. On a film taken in full expiration, there was definite upward displacement of the triangular shadow with increased convexity of its lateral borders. Fluoroscopy revealed that the major portion of this density was in the anterior portion of the chest and sloped gradually toward the level of each hemidiaphragm, encroaching on the posterior inferior portions of the thorax. In the upright position, faint but definite systolic expansile pulsations were noted in the upper halves of this density, along both its right and left margins, becoming less prominent as the bases were approached. These expansile pulsations were extremely minimized when
the patient was put in a supine position. The assumption of a supine position resulted in a broadening of the superior portion of this silhouette and replacement of the straightened lateral margins by a determined. Gastrointestinal series and barium enema failed to reveal any evidences of herniation of subdiaphragmatic structures into the chest. An intravenous urogram failed to reveal any evidences

convexity. There was posterior displacement of the barium filled esophagus both in the right and left oblique positions (fig. 1).

The electrocardiogram was essentially normal except for flat to diphasic T waves in precordial leads CF3, 4, 5, 6 and the electrical pattern did not change with positional change of the patient. A Master two step tolerance test was interpreted as normal (fig. 2).

The venous pressure was 140 mm. with no change on liver pressure. The circulation time was 10 seconds with saccharine and 8 seconds with ether. Patch test and Mantoux (1:1000) were negative. Laboratory studies showed a normal hemogram with 4,100,000 red blood cells, 13.4 Gm. of hemoglobin, 9,200 white blood cells with a normal differential count. The urea nitrogen was 10.9 mg. per 100 cc. and the blood sugar 104 mg. per 100 cc. The total protein was 7.05 Gm. per 100 cc. with an albumin of 4.00 Gm. and globulin of 3.05 Gm. and an albumin-globulin ratio of 1.3:1. The cephalin-cholesterol flocculation test after 48 hours was read as 1 plus and the thymol turbidity as 3.7 units. The sedimentation rate was 17 mm. in 60 minutes and the Kahn test was negative. Routine urinalyses were normal. A two-hour rat pregnancy test was normal.

Though the presumptive diagnosis was that of pericardial effusion we were most impressed with the absence of other clinical findings that are so commonly found in this condition. Chest tomography and angiocardiography were helpful only in establishing the fact that there was a normal size heart surrounded by a mass of a type which could not be

of any renal tumor or any suggestion of a perirenal mass.

Pericardial aspiration was then attempted in the third, fourth, fifth and sixth intercostal spaces to the right and left of the xiphochondral junction using a

**Fig. 1.** X-ray films before operation. These demonstrate the size and shape of the mass, as well as the normal size of the heart within the tumor as shown by the angiocardiogram.

**Fig. 2.** Electrocardiogram taken when the patient was first seen. The flat to diphasic T waves in the precordial leads are readily apparent.
16 gage needle. No fluid or tissue was obtained. Having considered the possibility of this being one of the lymphomatous conditions, a lime bean shaped node was removed from the left sublingual region which microscopically showed only a reactive lymph node with fibrosis.

The patient was then followed for the next five months without any change in his general condition. In view of the fact that there was a definite uncertainty as to the diagnosis in this case, it was decided that it would be justified to do an exploratory thoracotomy in the hope of establishing a diagnosis. On Feb. 13, 1950 a left thoracotomy was done at The Newark Beth Israel Hospital by Dr. H. Brodkin. A large tumor mass was found which wrapped around the heart much like a vest buttoned in the back. Because of its size it was removed in two stages, the second stage being done 11 days after the first. The patient's recovery was essentially uneventful. The specimen in its entirety weighed 2810 Gm. Grossly it appeared to be a lobulated mass of yellow-gray tissue which was irregular in shape. The first portion removed measured 20 cm. in length, 20 cm. in width and was 8 cm. thick, and the second portion was 55 cm. long, 14 cm. wide and 5 cm. thick. The lobulated tissue showed foci hemorrhagic discoloration of its surface. Section through the tissue revealed linear irregular areas of gray tissue having a granular appearance, the granularity being due to yellow flecks in the gray background. These irregular areas of gray tissue were surrounded by an abundance of yellow tissue resembling fat. This appearance was present with uniform consistency throughout the entire tumor (fig. 3).

Microscopic section of the left side of the tumor showed well differentiated thymoma with pleomorphic epithelial proliferation (fig. 4). The right side of the tumor also showed well differentiated thymoma but appeared to be relatively greatly reduced in comparison to the left portion. Furthermore, the epithelial component in this part of the tumor was much more prominent, but the pseudoglands seen in the previous specimen were not found.

When seen the day after he left the hospital, the patient was found to have a fluid collection in right paracardiac area of the mediastinum, the site of the dead space left after removal of the tumor. From our findings at the first operation, at which time we removed large blood clots from the left pleural space, this was believed to be clotted blood. The patient was observed another week following which aspiration was attempted and 50 cc. of dark brown thick fluid containing blood clots was removed with difficulty. Four days later 200,000 units of streptokinase was instilled after another 150 cc. of the same brown fluid had been removed. Two days later over 500 cc. of dark brown fluid was easily removed, the fluid having thinned out remarkably. Three days later another 400 cc. of fluid was removed, and repeated x-ray films revealed a clearing of the "fluid" shadow.

The patient's recovery has been excellent and at the present time he offers no complaints whatsoever. He is working at his usual job with his usual good tolerance to effort.

When last examined on Aug. 18, 1950, his condition had returned to normal but the most interesting finding was the fact that his electrocardiogram now had normally upright T waves in the precordial leads instead of the flat to diphasic T waves which had been present originally (fig. 5).

Discussion

It is apparent from the description, x-ray films and electrocardiographic findings that this tumor caused confusion in diagnosis because of the fact that it more or less enveloped the heart and showed none of the usual eccentric enlargements seen with mediastinal tumors. Furthermore, its high fatty content and the "fluidity" of this tissue served to further confuse the issue because it acted much like a pericardial effusion would when the patient assumed the upright and recumbent positions. However, several findings mitigated against the diagnosis of pericardial disease of a massive type. In the first place there was an absence of significant cardiac findings since the patient was able to do hard work. Furthermore, there was an absence of the usual signs such as small pulse pressure and changes in the electrocardiogram. Again, repeated aspirations failed to yield any fluid. The possibility of lobulation or thick adhesions, as occasionally observed in tuberculous pericardial disease, was considered, but since the patient worked and felt so well we did not believe that this was probable. It was difficult to conceive that any of the usual types of pericarditis could produce this picture without reducing the patient to a state of invalidism.

In reviewing the literature we find only 2 cases reported that are similar to the one herein described. Andrus and Foote removed a 2235 Gm. tumor containing fat and thymic tissue from a 13 year old boy and Hall found an 1100 Gm. thymus-containing tumor in a 47 year old laborer killed accidentally. In both these cases, it should be noted that the tumor was actually in one of the pleural cavities pushing the heart aside rather than enveloping it.
McCorkle and co-workers have described 34 cases of benign lipomas which simulate the tumor found in this case in their general contour and mobility but differ histologically. They describe one lipoma which weighed 16 pounds when removed at autopsy. In addition, the literature records much discussion on the use of the term thymoma to describe mediastinal tumors containing fat and thymic tissue. However, under the circumstances, this matter is not pertinent to this discussion and will be left to a further report based on the microscopic pathology. The relation of thymic tumors to myasthenia gravis also need not be discussed here since the patient had no symptoms of this disease.

The symptomatology in the reported cases varied from none to dyspnea, cough and cyanosis depending upon the size and location of the tumor as well as the structures upon which it pressed or which it distorted. The amount of fat, and therefore, the mobility and fluidity of the tumor are also important in that they govern the ability of the tumor to adjust to the surrounding structures rather than to obstruct and displace them.

In our case, the gynecomastia was also of some interest to us. Because of its presence we suspected the possibility of a teratoma of the testicle with metastasis and, accordingly, did the two hour rat test for gonadotropins in the urine. As noted, this was negative. In searching for another explanation for this phenomenon, we found the discussion of gynecomastia by Fried very illuminating. He showed that, in the presence of tumors of the lung, gynecomastia was found in many cases. He believed that this, along with other of his findings,
proved that the lung is an organ of internal secretion in addition to its other functions. Breast enlargement has disappeared since the removal of his tumor.

Fig. 4. Section of the thymic tumor showing well developed Hassall's corpuscle, lymphoid and reticular cells and fat cells. H & E, 180X.

Fig. 5. X-ray film and electrocardiogram taken at the time of the patient's last visit. The lung fields have now entirely cleared. The electrocardiogram shows upright T waves in the precordial leads, as well as an increased voltage of the QRS complexes.

Though our patient did not have a tumor of the lung, there was some lung compression by this mass and it is most interesting that the

Another point worthy of note was the use of streptokinase11 to dissolve the postoperative blood clot so that it could be aspirated and so
speed the recovery of the patient. It is possible that if permitted to remain, this mediastinal collection of blood may have been a source of trouble to the patient in later years if not immediately.

The findings in this case justify the statement that a thymic tumor containing a large amount of fat may simulate a pericardial effusion because of its ability to accommodate itself to the structures surrounding it and be shaped by them rather than distort them. Therefore, though a rare occurrence, it must be considered in the differential diagnosis of pericardial effusion.

**SUMMARY**

1. An asymptomatic thymoma weighing 2810 Gm. which was discovered by a routine chest roentgenogram is reported.

2. Because of its “fluidity” it adjusted itself to surrounding structures and simulated pericardial effusion.

3. The necessity of adding thymic tumor to the conditions which must be differentiated from pericardial effusion and the relationship of mediastinal tumor to some cases of gynecomastia is demonstrated.

4. The value of streptokinase in liquefying postoperative mediastinal hematomas was again demonstrated.

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