MEDIASTINAL TUMOR CAUSED BY HODGKIN'S DISEASE*

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LYMPHADENOMA (Hodgkin's disease) apparently is an infectious granuloma with a characteristic histologic picture and a typical clinical course. The clinical aspect is usually that of a slow, painless, progressive enlargement of the lymphatic nodes of the body, beginning with those of the cervical chain. Later, other organs, especially the liver and spleen, are involved. Generally the disease is considered as incurable, although improvement for many years may follow treatment.

In the typical case the cervical nodes are the ones first affected. In the statistics compiled by Baldridge and Arve (1930) the mediastinal nodes were reported as primarily enlarged six times in a total of 136 cases. Wessler and Green (1920) and others distinguish a mediastinal tumor caused by Hodgkin's disease. Ewing concludes that mediastinal Hodgkin's disease is a thymic tumor and different from the ordinary Hodgkin's disease. Ziegler, in his monograph, describes the mediastinal type of Hodgkin's disease in detail and states that it may be impossible to determine whether the processes arise in the lymph nodes or in the thymus, since at the stage at which death occurs there is no evidence of thymic origin. He believes that it may be assumed that the granulomatous process has its origin in the peritracheal lymph nodes and that larger single granulomatous masses are secondarily formed in the anterior mediastinum, the loose tissue of which favors the formation of large single masses. Apparently he questions the occurrence of purely single Hodgkin's tumors in the anterior mediastinum and suggests that the primary seat may be in the lymphatic tissue of a persistent thymus.

Hodgkin's disease is considered as being sensitive to radiation and thymic new growths as being radioresistant, and hence it would seem that the reaction of mediastinal tumors to a test dose of radiation would be of value in their differential diagnosis. Haagenson believes this to be true. It is not true in the case herein reported because this patient was thoroughly treated by radiation without improvement and yet the histologic picture is precisely that of Hodgkin's disease. We must assume, therefore, that it represented an unusual case of radioresistant Hodgkin's disease or was of thymic origin indistinguishable from Hodgkin's. There is no evidence of thymic tissue in the microscopic sections.

Case Report.—No. 713. 1936. Female, age 17, was admitted to the Misericordia Hospital August 17, 1935, complaining chiefly of dyspnea on exertion. Her history

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dated back to February, 1933, at which time she was given a tuberculin test at school which showed a slight reaction (plus one). A roentgenogram of the chest showed a shadow on the left side that was considered as being either a persistent thymus, a mass of tuberculous lymph nodes, or possibly a sarcoma. Six months prior to this time, however, she complained of a dry cough which lasted the entire summer of 1932. Shortly after the detection of the mediastinal shadow the patient was put to bed and remained there for a period of one year. During this period no abnormal temperature, cough, pressure symptoms or loss of weight was noted, although the patient developed a general physical weakness which has continued.

In September, 1933, she was given a series of roentgen therapy treatments, but, if anything, there was enlargement of the shadow rather than a diminution. In March, 1934, she was again examined and at that time the diagnosis was made of a benign tumor of the mediastinum or an enlarged thymus gland. The patient was allowed out of bed to lead a normal life but without strenuous exercise. In September, 1934, she was admitted to the Hospital of the University of Pennsylvania. Roentgenologic examination by Doctor Pendergrass showed a shadow inseparable from that of the heart, and he believed the case was one of benign tumor of the anterior mediastinum, suggesting the possibilities of a cyst springing from the pericardium, a thymoma or a lipoma. He noted that the mass was considerably larger than was noted in the roentgenograms taken a year previously. She was seen by Doctor Wolferth, who advised a conservative policy unless there was evidence of bronchial compression. She was bronchoscoped by Doctor Tucker, who found that there was an oval appearance of the lumen of the left main bronchus but no indication of localized compression or infiltration of the left bronchial stem. He also believed that unless the condition caused symptoms from pressure or inflammatory exudates, it might be better to keep the patient under observation. This was done, but in the summer of 1935 it was felt that the shadow was getting larger, and accordingly she was referred for operation.

At the time of her admission, as has been noted, there were no symptoms except weakness and dyspnea on exertion. There was an area of dulness corresponding to the mass seen in the roentgenograms, with evidence of pulsation. We agreed with the earlier report of Doctor Wolferth that this was a transmitted pulsation and not that due to aneurysm.

Roentgenologic Examination.—By Doctor Bertin. Chest examination in the P. A. view shows an enormous enlargement of the cardiac silhouette and depicts an abnormal projection smoother in contour from the left border of the heart shadow. The right border of the cardiac shadow is displaced to the right. The lateral view shows this entire huge shadow overlying the heart shadow anteriorly. The posterior border of the shadow is slightly more prominent than normal and impinges only very slightly into the mediastinal space. It is therefore likely that this mass does not originate in the posterior mediastinum. Its nature and exact extent cannot be demonstrated from the film alone. There is a sharp angulation in the middle of the right diaphragm which is characteristic of pleural adhesions. There are numerous small calcified bronchial lymph nodes on both sides with no evidence of active disease in either lung. The left base is slightly more dense than the remaining portion of the lung area, possibly due to compression resulting from the enlargement in the anterior chest.

Fluoroscopically we were able, however, by rotation in various positions, to determine the cardiac silhouette apart from this general mass to the left of the cardiac border. During forced inspiration the apex of the heart could be clearly visualized and the cardiac shadow showed no evidence of enlargement. The mass showed general wave like pulsations corresponding with the heart beat but decidedly less marked, giving the impression of a cyst like mass, situated immediately in front and to the left of the heart shadow.

The impression finally arrived at was that she had either a dermoid cyst or a benign tumor such as a fibroma or lipoma. It is interesting to note that a cousin died some
years previously from a condition suggestive of a large sarcoma or tumor in the mediasti-
num. No operation was performed.

Except for being thin and somewhat weak the patient was in good general condition. 
Hemoglobin 65 per cent. R.B.C. 3,060,000. There was no leukocytosis. A Wassermann 
test was not made. Operation was performed August 20, 1935, under gas-ether anes-
thesia with provision for positive pressure in the mask. Arrangements were made for 
endotracheal anesthesia if such was deemed necessary. As a matter of fact there was no 
trouble with the anesthetic.

Operation.—An incision was made, similar to that described by Graham, and ex-
tended transversely over the level of the fourth rib three inches on either side of the 
sternum. As the exact relation of the tumor to the heart, its adhesion and its location 
were somewhat uncertain, it was thought advisable to begin on the right side so as to 
approach it from near the median line, and work across. As in Graham's technic, the 
sternum was to be divided transversely. Accordingly the third and fourth ribs were 
exposed and a small portion of the cartilages removed on either side. With finger ex-
ploration across the posterior aspect of the sternum it was found that the tumor was 
anterior to the heart in the anterior mediastinum, that it was solid and not cystic, and 
was encapsulated. The fourth costal cartilage on the left side was then removed for a 
short distance and the sternum divided with a Gigli saw. Sometime during this pro-
cedure the right pleura was nicked but as the lung was easily inflated and the pleura 
readily closed with catgut sutures, it was thought that no harm had resulted, although 
later a moderate degree of pneumothorax was noted. The divided sternum was then 
retracted and the tumor mass, measuring 6 by 4 by 2 inches in size, was gradually dis-
sected from the surrounding structures. It was impossible to do this without a wide 
opening of the left pleura. A small pedicle, perhaps one-eighth of an inch in diameter, 
tapering upwards toward the neck, was divided. It seemed to carry a blood supply. 
The tumor mass was then drawn from the wound and the pleural cavity on the left side 
sutured as carefully as possible, although it was realized that this was imperfectly accom-
plished owing to its thinness. The sternum was drilled and a doubling suture of number 
two chronic catgut introduced to draw it together in a mattress fashion. Owing to the 
fact that a good deal of oozing was present in the mediastinum and fearful that this 
might seep into the pleural cavity, it was thought advisable to introduce a cigarette drain 
for a few days. It was thought that the pleura would become adherent to the tract and 
oblitrate it. In this we were in error. The muscles, fascia and skin were brought 
together and the patient given 500 cc. of citrated blood intravenously. She left the table 
in good condition.

As things turned out it would have been satisfactory to have approached this tumor 
entirely from the left side, but the roentgenograms were somewhat misleading in making 
us believe that it was under the sternum, extending to the left, when actually it barely 
touched the sternum on the left side.

Following the operation the patient had a stormy first 48 hours, probably due to the 
considerable pneumothorax remaining on the left side and the moderate pneumothorax 
on the right side, thus causing a limitation of vital capacity. She was kept in an oxygen 
tent for four days and was able to breathe easily without dyspnea after removal from the 
tent. The cigarette drain was removed. However, dyspnea always was pronounced and 
the patient seemed to have difficulty in moving the thoracic cage during and after respira-
tion. This produced, I think, a sawing effect on the catgut because in about ten days' 
time the lower part of the sternum sank somewhat and this seriously interfered with the 
motions of the lower part of the chest. This was disastrous in another way because it 
kept the wound opened at the site of drainage and we soon saw that this communicated 
with the left pleural cavity, keeping up the pneumothorax in spite of every effort made 
to plug this hole and remove the air in the left chest by aspiration. Shortly afterwards 
she developed a pleural effusion on the right side which was aspirated several times and
still later she developed a purulent effusion in the left cavity although at first no organisms were found to culture but later a Staphylococcus albus was discovered.

On September 19, 1935, under local anesthesia, an interrib drainage was introduced, attached to a continuous aspirator, following which there was a considerable increase in the expansion of the left lung. Early in October the right side appeared to show but little fluid and only a small degree of pneumathorax. Collapse of the left lung, however, was total. At this time I anticipated that the patient might make a difficult but an ultimate recovery. It should be mentioned that several transfusions were given during this time.

![Appearance of tumor on bisection.](image)

However, on October 17, 1935, she developed a cold, an acute bronchitis and apparently a bronchial pneumonia, which so violently interfered with the respiratory function that nothing availed and she died October 19, 1935.

**Pathologic Examination.**—By Doctor Camero. The specimen consists of a well circumscribed, well encapsulated, ovoid, tumor mass measuring 15 by 12 by 10 cm. The surface is smooth. The cut surface is uniformly white, firm around the periphery and softer in the central portion. The mass is not very vascular (Fig. 1).

**Microscopic Examination** of several sections made from the tumor mass shows the tissue to be undoubtedly lymphoid in origin. Lymph node architecture is almost completely destroyed though there persist small follicles and an hyperplastic reticulum. The chief histologic features are: (1) Irregular abundant fibrosis, some of which has undergone a sclerosing process. (2) Marked variation in the type of cells. The following types of cells are predominant, lymphocytes, eosinophils, neutrophils, fibroblasts, mono-
cytes, other mononuclear cells and typical Dorothy Reed giant cells. (3) Necrosis. Scattered areas show necrosis (Figs. 2 and 3). The histologic picture here seen and above described is typically that of Hodgkin's disease. The sections were shown to Dr. Herbert Fox, who confirmed the diagnosis.

An autopsy showed nothing that was not known prior to death, the principal features of which were an atelectasis of the left lung, a bronchial pneumonia with partial atelectasis of the right lung and the remnants of a left empyema. There was an hyperplasia of the lymph nodes in the mediastinum but no evidence of Hodgkin's disease in them. There was all hyperplasia of the lymph nodes in the mediastinum but no evidence of Hodgkin's disease in them. There was no evidence of the nodules of Hodgkin's disease in the spleen, liver, pancreas or kidneys. The heart and pericardium were normal. The patient apparently died from the bronchial pneumonia following the greatly lessened air capacity of the two lungs.

DISCUSSION.—DR. CARL EGGERS (New York).—There are several angles from which this case may be discussed: (1) The presence of an isolated Hodgkin's tumor in the mediastinum. (2) The treatment of Hodgkin's disease by surgery in general. (3) Removal of a mediastinal tumor, and the technic employed.

Most clinicians and pathologists, however, agree that a glandular tumor, usually multiple in character and showing on section typical structure and presence of certain cells including Dorothy Reed cells, lymphocytes, plasma cells, endothelial cells, eosinophilic leukocytes and multinucleated giant cells, may be regarded as a malignant granuloma or Hodgkin's disease.

The question which interests us as surgeons is whether Hodgkin's disease is at first a local disease, like a malignant tumor, and whether recognition and removal at this time may cure the disease, or whether it should always be considered a general affection of the lymphatic system.

There is ample evidence that at times removal of a single mass of involved Hodgkin's lymph nodes is followed by a long period of freedom from the disease or even an apparent cure, similar to carcinoma in which the primary tumor has been removed and apparent cure results until metastases make their appearance.

In the majority of cases the exciting agent is supposed to enter through the mucous membrane or through lesions of the skin, and the cervical and supraclavicular nodes are usually primarily affected. At times the disease
first makes its appearance in the abdominal, mediastinal, inguinal or other nodes.

Where the source of entry was in the case described by Doctor Muller is impossible to state. The tumor was found during a routine examination, and it is interesting to note that it did not respond to roentgen therapy. During the Annual Meeting of the American Association for Thoracic Surgery in 1928 Dr. William Lerche reported an interesting case in which had developed successively Hodgkin's tumors in the left and right supraclavicular fossae and finally in the mediastinum. He performed incomplete operations followed by roentgen therapy. There was a clinical cure and the patient was in excellent health at the time of publication, 18 years after the onset of the disease and seven years after the last operation. With his characteristic attention to detail, Doctor Lerche has worked out the probable course of extension of the disease from the neck to the mediastinum and his article can be highly recommended to those interested in this subject.

The question may be asked whether Doctor Muller would have operated had he known in advance that the mass was an isolated Hodgkin's tumor. Though the surgical treatment of Hodgkin's disease is not popular at the present time, I believe that unless there is generalized disease present an attempt at removal of the primarily involved nodes, followed by roentgen therapy, is justified.

On the other hand, most of the more recent contributions stress the value of roentgen therapy alone. Clinically one may recognize favorable features of the disease, and less favorable ones. Localization in one area is held by most observers to be a favorable sign, and it is this variety which lends itself to surgery. In that sense Doctor Muller's case might have been considered surgical even had the diagnosis been known in advance, especially in view of the fact that it did not respond to roentgen therapy.

REFERENCE