

# MALIGNANT LYMPHOCYTOMA OF THE MEDIASTINUM.

## THE REPORT OF A CASE.\*

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TUMORS of the mediastinum are uncommon but are not rare. According to statistics from the St. Bartholomew's Hospital, London, tumors of the mediastinum occurred in the proportion of one in five hundred of all their medical cases.

Christian, in his article in Osler's "Modern Medicine," classifies mediastinal tumors as primary and secondary. He subdivides the primary tumors into benign and malignant. Of these, the malignant tumors are the most common. The benign tumors are rare and may be fibromas, lipomas, chondromas, myomas, dermoid cysts, simple cysts, teratomas, or intrathoracic goiters. The primary malignant tumors are classified structurally as sarcomas, carcinomas, endotheliomas and lymphomas.

Secondary tumors of the mediastinum may result from metastases from any of the malignant tumors elsewhere in the body. The commonest of these metastatic tumors are the carcinomas. They are usually confined to the lymph nodes and, as a rule, are secondary to carcinoma of the breast, lungs or pleura; less commonly the abdominal organs. Metastatic sarcoma of the mediastinum is rare.

Primary tumors in this locality are generally thought to arise from the lymph nodes, connective tissue, thymus gland, thyroid gland, accessory thyroid gland or cell rests. Of these the lymph nodes or thymus gland are thought to be the chief sources. But the organ or even the tissue from which primary tumors originate here may be difficult or even impossible to determine. This is especially true of those that arise from the normally or abnormally placed organs in this locality, as the cells of these tumors may show little or no tendency to differentiate into a histological structure similar to that from which they arose. It may be even difficult to tell if they have their origin in the mediastinum itself, as there is often such widespread involvement of the surrounding tissues. As a rule, primary tumors in this locality grow by direct extension rather than by metastases and may involve all the contents of the mediastinum as well as the adjacent tissues, and occasionally may even involve the heart, as in the case reported here and the one described by Drs. Martin and Klotz.<sup>1</sup>

Clinical Case Report: M. 796, 1910.

G. W., male, aged fifty years, admitted Sept. 27, 1910, complaining of cough, dyspnea and ulcer on the front of his chest.

His family and personal histories are unimportant. The present illness began on July 10, 1910, with cough and expectoration of thick, whitish sputum. These symptoms have gradually become worse and have recently been aggravated by the taking of food; vomiting has occasionally followed these coughing spells.

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<sup>1</sup> Am. Jour. Med. Sci., August, 1910, vol. cxi, No. 2, p. 216.

He has never noticed blood in the vomitus. During the last five weeks he has had a very poor appetite, has slept poorly and there has been marked loss of strength and weight.

About the end of July, or beginning of August, one month after the onset of symptoms, he was kicked in the chest by a horse. There were no immediate ill-effects, but about two weeks later the tissues at the site of the kick become very painful, swollen and the skin over them showed a brwnish discoloration. The pain soon subsided, but the swelling gradually increased. Three days before admission to the hospital the swelling on the chest again became painful, especially at night. He described the pain as giving the sensation of needles being stuck into the swollen area. For the past two weeks he had been compelled to sleep in a sitting position owing to shortness of breath and aggravation of the cough when he laid down. There have been no dizzy spells, no edema and no palpitation of the heart.

*Present condition.*—The face is full and flushed. The veins of the neck are distended, most marked on the right side, where the external jugular vein stands out prominently. The ears and lips are cyanosed and there is some puffiness under both lower eyelids. There is very little subcutaneous fat. The muscles are firm. Temperature normal; pulse 96 to 108; respirations 20 to 24. He assumes the dorsal decubitus and has occasional paroxysms of coughing. His mental condition is good. The respirations are shallow and there is marked dyspnea on exertion. Pupils are equal and active to light and accommodation.

*Physical examination.*—The lymph nodes in the axillæ are slightly enlarged, rather soft, discrete and freely movable. The superficial lymph nodes elsewhere are not increased in size. Dr. H. D. Hamilton reports that the larynx is normal. On the anterior surface of the chest, most marked in the middle right half, there is a prominence which extends over the greater part of the sternum and beyond both nipples. The entire front of the chest appears to be pushed forward. There is slight edema of the whole chest wall anteriorly. Beginning at the level of the second intercostal spaces there is an ulcerated area, 3 by 2 cm. in diameter. Its base is necrotic and it is surrounded by a large dull reddish, discolored zone. In the skin opposite the level of the attachment of the diaphragm there are clusters of dilated superficial veins. There is no tenderness on palpation. On percussion of the lungs there is resonance above and for a short distance below both clavicles and throughout both axillary regions. Over the remainder of the chest anteriorly there is absolute dullness. The breath sounds are distinct above the second intercostal spaces and throughout both axillæ, but are absent over the remainder of the chest wall in front. Posteriorly there is hyporesonance on both sides and the breath sounds are somewhat diminished in small areas throughout the right lung. The heart dullness cannot be differentiated from that generally over the front of the chest. The heart sounds are faintly heard; the pulmonic second is accentuated.

The subcutaneous veins about the umbilicus are dilated. There is some increased resistance in the epigastric region. The liver and spleen cannot be palpated, although the liver dullness extends two fingers' breadths below the costal margin. In Traube's space the splenic dullness merges with that in the chest. There is marked dilatation of the veins of the arms.

The blood count shows: Leucocytes, 1,200; erythrocytes, 3,950,000. Urinalysis is negative.

While he was in the hospital, cough and dyspnea was always present; his temperature remained normal;

respirations 44, pulse 88-112, and he complained of very little pain. The tumor in the tissues of the anterior chest wall enlarged, the ulcerated area increased in size and the peripheral zone of discoloration became wider. The distended subcutaneous veins opposite the level of the attachment of the diaphragm and about the umbilicus increased in prominence. The right arm and hand and the left hand, both legs and both feet, became very edematous and cyanosed. The right radial pulse at the wrist became imperceptible; that at the left wrist was barely palpable.

On examination of the chest the day the patient died the following conditions were noted: Supraclavicular fossæ are resonant. There is diminished resonance to the second intercostal spaces external to the mid-clavicular lines. The remainder of the thorax anteriorly is dull. The axillæ are resonant. On the right side there is resonance in the axillary line to the sixth rib, while below this the note is dull. Posteriorly there is dullness below the fifth rib on the right side, but the left lung is resonant. Anteriorly the breath sounds are distinct over the resonant area and absent over the dull area. Over the dull area posteriorly the breath sounds are distant and tubular. There are a few moist crepitations at the bases behind.

*Extract of Protocol (Dr. Waugh).*—There is slight edema of the lower and upper extremities, most marked in the left hand. Beginning 9.5 cm. below the supra-sternal notch there is an ulcerated area with slightly undermined, elevated edges. This ulcer is irregularly elliptical in shape, 2 cm. in its longest diameter and 3.5 cm. broad, and extends more to the right side than to the left. The edge of the ulcer is surrounded by a dark purplish discolored zone which varies in width from 3 mm. to 6 cm. In the skin opposite the line of attachment of the diaphragm there are numerous small distended veins which run in the direction of the long axis of the body. Along the lower border of both pectoralis major muscles near their origin there is a mass 6 cm. in diameter. The skin is freely movable over them, but they are fixed to the deep structures. Both superior epigastric veins are distended and tortuous. A few discrete lymph nodes are palpable in the right inguinal and both axillary regions. The cervical lymph nodes are not palpable. Chest measurements: Circumference at nipples, 81.8 cm.; circumference at subcostal angle, 78.8 cm.; circumference at costal margin, 68.5 cm.; circumference at axillary folds, 84.2 cm. The tissues over the sternum are thickened and firm. In the mid-line, at the level of the third rib, they are 3.8 cm. thick; at the fifth rib, 3 cm., and at the costal angle, 2.5 cm. This thickening is due to tumor tissue of the same character as that described below in the mediastinum.

The liver is 7 cm. below the costal margin in the mid-clavicular line and 3.5 cm. below the sternophoid articulation. The peritoneal cavity contains 15 ccm. of clear, straw-colored fluid. The liver shows congestion about the central veins. There is but one kidney and one adrenal. The kidney weighs 240 gms. and the adrenal is normal. There is only one ureter. This empties into the bladder at the normal level 5 mm. to the right of the median line. The organs of the neck show no metastases. There is no infiltration of the trachea or esophagus.

The mediastinum is completely filled with a reddish-gray firm mass which is firmly united to the anterior surface of the parietal pericardium and is continuous with the tumor over the anterior surface of the chest wall. That part of the tumor in the superior mediastinum is nodular and is intimately connected with the arch of the aorta and with the innominate and left common carotid arteries. The innominate veins are

intimately associated with the tumor and in their first portions are completely surrounded by it. The left subclavian vein is likewise surrounded by tumor which compresses its lumen. The right pleural cavity contains 100 ccm. of clear straw-colored fluid. Posteriorly and laterally the pleuræ are free from tumor, but they are united by a few small fibrous adhesions. There is no increase of fluid in the left pleural cavity. In the apex of the right lung, there is a firm, sharply demarcated, grayish area of bronchopneumonia. The middle lobe of the right lung is atelectatic and its middle third is diffusely infiltrated with tumor which is continuous with that in the mediastinum. Along the inner border of the lower lobe of the right lung there is also tumor infiltration. The left lung is larger than the right; the left upper lobe in its anterior portion is firmly united to and infiltrated by the adjacent tumor. The peribronchial lymph nodes are involved by continuity. Anteriorly both lungs are infiltrated with tumor which is continuous with that in the mediastinum and that in the subcutaneous tissue on the anterior chest wall. The lumen of the trachea is nowhere restricted. The bronchi are injected.

The heart is of normal size. The valves are normal. In the right auricle there are several small subepicardial nodules which are easily palpable. At the left auriculo-ventricular groove, just beneath the epicardium, there is a nodular tumor 1 cm. in diameter. In the left ventricle, 3 cm. below the mitral valve, there is a subendocardial tumor 1 mm. in diameter. The right border of the inferior vena cava is firmly adherent to the tumor mass. Its opening into the auricle is normal. The cardiac orifice of the superior vena cava is represented by a slit-like opening, 1 cm. in diameter, and the vessel itself is surrounded by tumor. One centimeter from the cardiac orifice the lumen of this vessel measures 1.5 cm. in diameter.

The left pulmonary vein is normal. The right is compressed and its auricular orifice is represented by a linear button hole opening 8 mm. long, the two edges of which are closely approximated. Entrance into the lumen of this vein can be made with difficulty even with a small probe.

Anteriorly and laterally the aorta is intimately connected with the mediastinal tumor to a point 5 cm. below the subclavian artery. Three centimeters from the aortic orifice the lumen of the aorta is narrowed by pressure from the surrounding tumor. At this point the lumen is 1.5 cm. in diameter.

*Microscopical description of the mediastinal tumor.*—The following description is based upon sections stained with eosin methylene blue and Mallory's phosphotungstic acid hematoxylin and connective tissue stains.

Section 1: This section consists of a very cellular tissue throughout which are small areas of fat, numerous distended blood vessels and areas of connective tissue. Both the fat and connective tissue are infiltrated with cells and are edematous. The blood vessels are small, dilated with blood, and, as a rule, have very thin walls. The greater part of the section is composed of cells with dark staining nuclei. As a rule, these cells are fairly uniformly distributed throughout the section, but at one border they appear in small groups, in the centers of which there is generally a distended, thin-walled blood vessel. These small groups of cells are roughly separated from one another by the tissue which they infiltrate. The amount of stroma of the tumor varies. In the greater part of the section there is little, but at the borders there is comparatively a large amount. The tumor cells are of the same general character, but vary in size and shape. As a rule they are round, a little larger than a lymphocyte, are mono-

nuclear and contain a small amount of cytoplasm. Some of them are flattened and elliptical. Besides the mononuclear cells there are a few multinucleated cells, some of which contain two, three or even four nuclei which vary in size. The nucleus of the mononucleated cells is generally rounded, both centrally and eccentrically situated, stains deeply with the basic dyes, occupies most of the cell, often contains a nucleolus, and a few of them show mitotic figures. The cytoplasm of the cells stains lightly with eosin and has a granular appearance. No intracellular fibrils are demonstrable.

Besides the cells of the type described above there are a few with eccentrically placed crescentic shaped nuclei.

Section 2: This section is taken from the periphery of the tumor mass and is composed chiefly of a vascular connective tissue. Surrounding, and intimately associated with many of the blood vessels, are large and small groups of tumor cells. These cells have the same characteristics as those described in Section 1.

Section 3: From one of the small nodules in the heart. The section consists of heart muscles and tumor cells similar to those described in the sections from the mediastinum. The tumor cells are situated in the tissues between the muscle bundles which are somewhat flattened.

Section 4: Lungs. Sections through the areas of tumor show cells of the same character as those in the mediastinum. No metastases were found in the sections examined from the other organs and tissues of the body.

*Summary.*—The case reported above shows briefly the following: Congenital absence of one kidney, ureter and adrenal, and a tumor which has completely filled the mediastinum, infiltrated the heart and surrounding tissues, and by pressure has constricted the lumen of some of the large blood vessels in this locality. Histologically the tumor is a lymphocytoma.

## Reports of Societies.

### ASSOCIATION OF AMERICAN PHYSICIANS. TWENTY-SIXTH ANNUAL MEETING HELD AT ATLANTIC CITY, N. J., MAY 9-10, 1911.

(Continued from No. 26, p. 932.)

#### EFFECTS ON BLOOD PRESSURE OF THE VARIOUS ANATOMICAL COMPONENTS OF THE HYPOPHYSIS. (WITH LANTERN SLIDES.)

DRS. JOSEPH L. MILLER, DEAN D. LEWIS, S. A. MATTHEWS, Chicago: It has been generally conceded that the pressor substance in the hypophysis is confined to the posterior lobe. It has not been definitely determined whether it originates in the pars intermedia or pars nervosa. The authors have been able to demonstrate that the anterior lobe also contains a pressor substance, but its action is usually masked by excessive amount of depressor substance present. By first removing the depressor substance by extracting with alcohol, it was possible to demonstrate a pressor substance in the anterior lobe. It was determined that this pressor substance is confined chiefly to that portion of the anterior lobe adjacent to the cleft and which histologically is pars intermedia. Both portions of the posterior lobe contain a pressor substance. Cysts of the pars intermedia and colloid from the cleft, the secretion from the pars intermedia, have a distinct

pressor effect. It is scarcely probable that the tissues so entirely different as the pars intermedia and pars nervosa should contain a pressor substance. Herring's theory that the secretion from the pars intermedia passes into the pars nervosa would explain these findings. Failure to detect any pressor substance in the infundibular process, or stalk, might be interpreted as unfavorable to the view that the pressor substance passes through the stalk to the third ventricle.

#### SPORADIC ELEPHANTIASIS. (WITH LANTERN SLIDES.)

DR. WILLIAM GILMAN THOMPSON, New York: I report four cases of elephantiasis occurring in persons who had never been in foreign countries and, therefore were never exposed to filaria. Neither filaria nor plasmodia were revealed by blood examination. There was nothing to throw light on the etiology. There was found considerable hypertrophy of the entire skin. The fibrous tissue was enormously increased. There was the usual corneal edema. There was great enlargement of the sweat glands and the lymphatics and blood vessels were considerably increased in size. Only one of the four cases did not give a history of periodical febrile exacerbations.

DR. F. C. SHATTUCK, Boston: The conclusions which I came to in a recent paper on elephantiasis were that none of the theories in regard to the etiology of this disease are adequate. I believe the cause is either multiple or else entirely unknown in its basic principles. In a number of cases I believe that chronic infection is an element in the causation.

#### AN EXPERIMENTAL STUDY OF THE PAIN SENSE IN THE PLEURAL MEMBRANES. (WITH LANTERN SLIDES.)

DR. JOSEPH A. CAPPS, Chicago: In hydrothorax the presence of fluid frequently so retracts the lungs and flattens out the diaphragm that the conditions are favorable for testing the sensation of the pleural membranes. This experiment was carried out by means of a long wire inserted through the hollow canula after thoracentesis. Thirty-five cases were thus explored with the following results. The visceral pleura gave no pain response to irritation. The parietal pleura was sensitive to slight pressure and the pain was accurately referred to the region irritated. The posterior third of the diaphragmatic pleura gave no pain response to irritation. The parietal pleura was sensitive to slight pressure and the pain was accurately referred to the region irritated. The posterior third of the diaphragmatic pleura and a margin one to three inches broad near its peripheral attachment responded with pain over the lower thorax and abdomen. The remaining portion of the diaphragm when irritated was characterized by pain in the neck region. The pain elicited from the pericardial pleura was also referred to the neck. The neck pain was sharp and localized in a small area of skin, usually situated over the ridge of the trapezius muscle, an area which received its sensory innervation from the third and fourth cervical segments. This pain is true referred pain and is transmitted from the diaphragm to the posterior cervical cord by the phrenic nerve. These experiments make it possible to map out quite definitely the portion of the diaphragmatic pleura which receives its sensory supply from the phrenic nerve, and the portion which receives its supply from the intercostal nerves.

#### THE PREVALENCE AND CONTROL OF VENEREAL DISEASES.

DR. GEORGE M. KOBER, Washington, D. C.: The absence of accurate mortality statistics in venereal diseases in civil life is due to the fact that the attending physician prefers to spare the feelings of the friends of the deceased by assigning some other cause of death.