TERATOMA OF THE TESTIS WITH TRIDERMAL METASTASES: A CASE REPORT

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Metastases from testicular teratomata commonly are composed of but one type of tissue. Very rarely, however, they may contain derivatives of all three germ layers.

Ewing (1) described a case of teratoma of the testis in which several elements metastasized, but each secondary tumor contained only one type of tissue. Steinert (2) recorded the only testicular teratoma in which individual metastatic nodules contained structures derived from the three germ layers. His case was that of a male twenty-one years of age who had an egg-sized tumor in the testicle and a large mass in the abdomen. The latter proved to be a group of metatstatic tumors in the retroperitoneal nodes. There were also metastases in the liver, lungs, bronchial nodes, and small intestine. Microscopically, the primary tumor contained cysts or ducts lined with various types of epithelium, including low cuboidal, stratified columnar, squamous, and even columnar epithelium with goblet cells; smooth muscle, cartilage, and tissue resembling chorionepithelium were also seen. The retroperitoneal mass contained all of these tissues, and in addition was made up of bone, epithelial cells which appeared carcinomatous, and connective-tissue cells which seemed to have undergone a sarcomatous transformation. The pulmonary and bronchial node metastases consisted of smooth muscle, cartilage, squamous epithelium, and cysts lined by columnar epithelium with some goblet cells. One metastatic tumor in the liver contained the same elements as the pulmonary metastases with the addition of bone and nervous tissue. Other liver metastases and the one observed in the intestine were composed entirely of chorionepithelioma.

The following case closely resembles that of Steinert.

Case Report

Clinical History: H. N., a forty-seven-year-old white male, entered Barnes Hospital on Nov. 24, 1931, complaining of orthopnea of one week's duration. Two months prior to admission the right arm had been edematous for two days, and one month before, the patient had coughed up small amounts of blood and mucus for a short period.

Physical examination revealed evidence of obstruction of the thoracic vessels; namely, cyanosis, subcutaneous edema, distention of the superficial veins above the waist, and a significant lowering of the blood pressure in the arms as compared with that in the legs. Widening of the area of mediastinal dullness and bilateral pleural effusion were noted. A small, hard, tender mass was palpated in the upper pole of the right testicle. Roentgenograms showed in addition to mediastinal widening, numerous circumscribed shadows throughout both lung fields, which were interpreted as multiple metastatic tumors. Laboratory findings were not significant.

X-ray therapy was given over the chest a few days after entry. There was a temporary improvement, but a chest plate taken a month later showed an increase in size of
FIG. 1. SECTION FROM RETROPERITONEAL NODE SHOWING A MASS OF SQUAMOUS EPITHELIUM WITH KERATINIZED CENTER, ENDOTHELIAL-LINED SPACES CONTAINING A FEW ERTHROCYTES, AND A GROUP OF GLANDULAR STRUCTURES LINED BY CUBOIDAL AND COLUMNAR EPITHELIUM. Loose fibrillary connective tissue infiltrated by lymphocytes comprises the stroma.

FIG. 2. RETROPERITONEAL NODE CONTAINING A MASS OF BONE SURROUNDED BY OSTEOID TISSUE, A CYST LINED BY CILIATED COLUMNAR EPITHELIUM, ADIPOSE TISSUE, CONNECTIVE TISSUE, AND MASSES OF UNDIFFERENTIATED CELLS.
the mediastinal mass. Fluid accumulated in both pleural cavities, and several thoracenteses were performed on the left chest. On Jan. 6th, 1932, the patient suddenly became extremely dyspneic, with both an inspiratory and an expiratory stridor. He recovered from this attack, but four days later signs of bronchopneumonia developed in the middle and upper lobes of the right lung, and death occurred on Jan. 12.

Pathological Findings: A post-mortem examination was performed five hours after death. Only the findings related to the testicular tumor and its metastases will be discussed in detail.

The testicular tumor was felt as a round, firm mass 1 cm. in diameter, in the superior portion of the right testicle. On section, the mass was of a pinkish white color, demarcated from the testicular tissue. In general the tumor consisted of small cysts, some of which contained gelatinous material while others were empty, areas of cellular tissue, and a few small grayish glistening plaques, the whole supported by interlacing strands of connective tissue.

There were many metastatic nodules 1 to 5 cm. in diameter in the retroperitoneal tissue overlying the vertebral and extending from the diaphragm to the brim of the pelvis. On cut section, they varied in their appearance. Some were soft and cellular with areas of hemorrhage and necrosis; others contained cysts of varying sizes, the largest of which were either single or multiloculated and were filled with clear fluid or with a gelatinous material. In many of the nodules there were hard shining areas of cartilage.

A mass of tumor nodules 8 × 4 × 4 cm. lay in the posterior mediastinum and was firmly bound to the thoracic aorta and to the esophagus. At one point the esophagus was so constricted by the surrounding tumor that only one finger could be admitted, but the wall did not appear to be invaded.

The superior mediastinum also contained tumor, which extended into the thymic remnant and was attached to the outer surface of the left innominate and subclavian veins. These masses presented in general the same gross appearance on section as did those in the retroperitoneal region. The left innominate and subclavian veins were completely filled by a firm yellowish-white mass which was tightly adherent to the vessel wall. A similar mass was attached to the wall of the right innominate vein, but did not occlude it.

The superior vena cava was collapsed for a distance of 4 cm. above the atrium of the heart. Extending from this point to the origin of the vein the lumen was found to be almost completely filled by a grayish-white, friable, cellular mass which was attached to the intima in many places.

Many tumor nodules were scattered throughout both lungs, varying in size from 0.5 to several centimeters in diameter. Most of these nodules were white, friable, and cellular, while in some there were areas of hemorrhage, and in many the centers were necrotic. A few of the small nodules were firm, resembling the retroperitoneal metastases in appearance.

In addition to these findings there were patches of bronchopneumonia in both lungs with a fibrous pleurisy in the right. In the right branch of the pulmonary artery, at the bifurcation, a round laminated embolus 0.5 cm. in diameter was seen. The liver was filled with innumerable small holes, and *B. welchii* was obtained on culture.

Microscopic Examination

Right Testicle: The section shows a tumor mass 0.75 cm. in diameter, surrounded by testicular tissue. The tumor is not encapsulated, although throughout most of its circumference it is well demarcated from the surrounding tissue. The neoplasm is composed of derivatives of all three germ layers, and consists of many structures, some well formed and some with only an abortive attempt at differentiation, jumbled together into a heterogeneous mass. The various components are: whorls of squamous epithelium with keratinized centers; cysts lined with single or stratified columnar epithelium which in places projects as papillary folds into the lumen, which contains albuminous material; groups of columnar epithelial cells in an arrangement resembling ducts and acini; plaques of well differentiated cartilage and of embryonal cartilage; strands of dense fibrillary connective tissue running between the different masses; and areas of large undifferentiated cells, supported by a fine fibrillary stroma. These undifferentiated cells are large, and consist of a pale oval nucleus,
FIG. 3. MEDIASTINAL NODE, SHOWING TWO NODULES OF CARTILAGE, ONE MORE HIGHLY DIFFERENTIATED THAN THE OTHER, A MASS OF KERATINIZED SQUAMOUS EPITHELIUM, AND TWO CYSTS, ONE LINED BY TALL COLUMNAR AND STRATIFIED SQUAMOUS EPITHELIUM, THE OTHER BY CUBOIDAL AND LOW COLUMNAR EPITHELIUM.

The central portion contains a group of undifferentiated cells.

FIG. 4. TUMOR NODULE IN LUNG, SHOWING SEVERAL EPITHELIAL PEARLS SURROUNDING A MASS OF NECROTIC UNDIFFERENTIATED CELLS.
in which the scanty chromatin is usually arranged in small granules near the nuclear membrane, and a narrow rim of cytoplasm. Frequently the nuclei are degenerated. There are a number of sinuses lined with endothelium and filled with blood.

**Retroperitoneal Nodules** (Figs. 1 and 2): In a section taken from one of the large, firm retroperitoneal nodules two cysts having a diameter of 1 cm. and several smaller ones are apparent to the unaided eye. One of the large cysts is lined with flat cuboidal epithelium, the other in part by simple columnar and in part by stratified columnar epithelium. A few strands of fibrillar connective tissue constitute the wall of the former, while the latter has bundles of cells which resemble smooth muscle, and which show the color reaction of muscle when stained by Van Gieson’s method. There are a number of small cysts, some with stratified columnar epithelium lining their cavities and albuminous material filling their lumina, and others whose epithelium is of the stratified squamous type, with some keratinization. Well differentiated as well as embryonal connective tissue is present.

A small circular collection of cells resembling a medium-sized graafian follicle is seen. The outer zone is composed of cells having large dark staining nuclei with a peripheral distribution of chromatin and very scanty cytoplasm, arranged in a band five to six cells wide. The central area is composed of cells twice the size of those in the outer zone, with large pale oval nuclei and a small amount of pink cytoplasm. Scattered through this body are a few polymorphonuclear leukocytes.

One portion of the section resembles nervous tissue. It shows a fine network of pink-staining fibrils with sparsely scattered nuclei which are not surrounded by visible cytoplasm. Several apparently normal peripheral nerves are present, as well as ganglia.

Some areas of well formed cartilage are seen, either surrounded by embryonal connective tissue, or by connective tissue with collagenous fibers. There are several small masses which appear to be bone, consisting of a dark purple matrix in which are lacunae containing cells. There is no attempt at marrow formation here. Immediately surrounding this calcified bone there is tissue which appears to be osteoid, consisting of a pink, homogeneously staining matrix which occasionally contains lacunae with cells. Surrounding the osteoid tissue there are strands of embryonal connective tissue. Each of these masses is encapsulated by fibrous tissue.

There are several areas composed of fat cells. Other areas are made up of groups of undifferentiated cells. In some of these there are cells with elongated, deeply staining nuclei and scanty cytoplasm, arranged in parallel sheets giving the appearance of a spindle-cell sarcoma. In others there are closely packed cells with a moderate amount of cytoplasm and irregularly shaped nuclei that stain with varying intensity and not infrequently are undergoing mitotic division.

Other sections of retroperitoneal nodules show more or less the same picture. Masses of undifferentiated cells compose most of the section of one of the solid nodules, while cysts lined with goblet cells are seen in another.

**Mediastinal Tissue** (Fig. 3): The tissue taken from the posterior and from the superior mediastinal tumors presents essentially the same features as are seen in the retroperitoneal and testicular neoplasms.

**Lung** (Fig. 4): The lung metastases do not contain the varieties of tissue observed in the sections previously described. One nodule composed principally of large undifferentiated cells also contains several small plaques of cartilage, a few epithelial pearls, and several small cysts lined with tall columnar epithelium. Other nodules are composed entirely of undifferentiated cells, most of which are necrotic, while still others are made up of plaques of bone or of cartilage.

**Vena Cava and Left Innominate Vein**: A cross-section of the vessels shows the lumina completely occluded by tumor tissue. The new growth merges with and destroys the intima throughout most of the circumference of both vessels. A few crevices lined by endothelium and filled with red cells lie between the tumor and the vessel wall, probably representing an attempt at recanalization. The center of the neoplastic tissue is necrotic, leaving only a shell of well preserved cells situated next the vessel. Most of the cells are undifferentiated, but there are also a number of multinucleated giant cells present in the innominate vein. In several places there are glandular structures lined by cuboidal epithelium, and in one instance by goblet cells, lying in a fibrous tissue stroma. In the necrotic portion of the
tumor in the vena cava, two small plaques of cartilage can be made out. A small amount of tissue near the periphery of the necrotic portion is calcified.

Summary

A case is described of teratoma of the testicle with metastases containing elements of all three germ layers in the retroperitoneal and mediastinal nodes, the mediastinal tissue, and lungs, and complete obstruction of the superior vena cava by tumor tissue derived from at least two germ layers.

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References