Case Report Section

Chondrosarcoma of the Posterior Mediastinum

A Case Simulating a Neurofibroma

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Mediastinal tumors are rare, but the number has increased during the past decade due to the large number of routine roentgenologic examinations of the chest, improvement in chest examinations, and progress in thoracic surgery.

The most common neoplasm of the posterior mediastinum is the neurogenic group of tumors. Neurofibromata as typical of this group often occur as round or oval-shaped next to the paravertebral gutter. When extension through an intervertebral foramen has occurred, the appearance may be that of an hour-glass or a dumbbell. Chondrosarcoma in any part of the mediastinum is rare. It is particularly unusual in the posterior mediastinum and is a unique tumor in the dumbbell variety. Such a case is that reported.

Few cases of chondrosarcoma of the mediastinum are gleaned from the literature. In 1929, Heuer¹ described a case of the posterior mediastinum involving the spinal cord reported by Elsberg. A discussion and review of anterior and posterior mediastinal tumors by Harrington²,³ in 1930 and 1935 did not include any chondrosarcomas. Heuer and Andrus⁴ in 1940 described two chondromatous tumors occurring in the posterior mediastinum, one being hour-glass in type and causing spinal cord compression. A case of huge chondrosarcoma arising from the chest wall, probably from a benign chondroma, and extending into the thorax and abdomen was presented by Harper⁵ in 1942. Six chondrosarcomas were found among 42 malignant mediastinal tumors (excluding lymphomas and metastatic tumors) by Uhrich⁶ at Mayo Clinic in 1947. A primary chondrosarcoma of the lung was reported by Lowell and Tuhy⁷ in 1949.

A very interesting case of chondrosarcoma of the posterior mediastinum in a 40 year old white farmer with an hour-glass involvement of the spinal canal, reported by Weisel and Ross⁸ in 1950, was resected with survival. A 48 year old white woman with an anterior mediastinal chondromyxosarcoma, reported by Schwinger and Hemley⁹ in 1953, had an inoperable mass which extended into and along the pulmonary artery.

Case Report: R. T. September 15, 1952. The patient is a 34 year old white male married salesman who was admitted to the hospital with the chief complaint of a burning and tingling sensation over the left shoulder and arm. This had not been severe at any time but had become more noticeable during the past three to six weeks. There had been a burning sensation over the left subscapular area intermittently for the past five years, he thinks. At times, he thought that he did not sweat as much on the left side of the chest. About four years ago, he had noted a swelling of the left side of the chest lasting about six weeks. There had been no weight loss, dysphagia, or dyspnea. Review of the systems was negative. Past history was non-contributory.

An x-ray film of the chest one year ago and four months ago were negative. Family history revealed no familial disease.

Physical examination revealed a well-developed, well-nourished strong cooperative, intelligent white male in no apparent distress. Temperature was 98.6 degrees, pulse
Blood pressure was 130/80. Skin was clear. The eye, ear, nose and throat examination was negative. The neck was normal. There were no palpable lymph nodes. The trachea was not deviated. Examination of the thorax showed good expansion, slight dullness to percussion over the posterior chest near the left subscapular area adjoining the spine. Breath sounds were normal. No rales were audible. The heart was normal in size, rate, and rhythm. Examination of the abdomen revealed no palpable organs, distension, or tenderness. The genitalia, rectal examination and extremities were normal. Neurological examination including sensations over the thorax was negative.

Complete blood counts, sedimentation rate, fasting blood sugar, non-protein nitrogen, VRDL test, liver function tests including the alkaline phosphatase test, and urinalysis were normal. A tuberculin test 1:1000 and a histoplasmin test were negative. An electrocardiogram was normal.

X-ray films of the chest, antero-posterior view (Figure 1), lateral views (Figure 2), and the dorsal spine (Figure 3) revealed a large oval-shaped well-circumscribed lobulated shadow in the left upper chest posteriorly at the level of the fourth, fifth, and sixth dorsal vertebrae extending to the spine where there is erosion of the posterior aspect of the fourth and fifth ribs and the lateral borders of the fourth and fifth dorsal vertebrae, and particularly the pedicle of the fifth. This is most likely a neurofibroma with probable intraspinal involvement at the level of the fifth dorsal vertebra.

*Figure 4, A and B:* Photomicrographs of biopsy specimen showing predominant cartilagenous tissue with undifferentiated fibroplastic elements. × 970 magnification.
The impression by three radiologists was that the patient probably had a neurofibroma on the basis of the dumbbell appearance and its position near the paravertebral area. A consultant neurosurgeon felt that the tumor was a neurofibroma, but that a chest surgeon should perform an exploratory thoracotomy. This was done by Dr. Robert McCracken.

On September 17, 1952, under endotracheal anesthesia with the patient in the lateral position, a posterolateral incision was made over the sixth rib. This rib was resected subperiosteally from the transverse process to the anterior axillary line. Small segments of the fifth and seventh ribs were also resected. The pleural cavity was entered through the bed of the sixth rib. A large, hard tumor mass, measuring about 16 to 18 centimeters in diameter, was found in the posterior mediastinum at this level. The mass was densely adherent to the lower lobe posteriorly, extending around the mediastinum to the arch of the aorta. There was a large mass on the aortic arch. There was some destruction of the fifth and sixth ribs posteriorly. Portions of the tumor were removed for sections. It was felt that the case was inoperable and the chest was closed.

Gross pathology revealed three specimens. Fragments of ribs showed erosion but no infiltration. The tumor tissue was white and firm. On cut section, this tissue was uniform and showed a cartilaginous consistency.

Microscopic examination (Figure 4) revealed variations of a basically similar pattern. Most of the tissue was cartilaginous, much of which was immature or abnormal. The cells were bizarre in appearance and disorderly in arrangement. Some areas showed osteoid tissue in irregular masses surrounded by osteoblasts. Other areas showed undifferentiated fibroplastic elements where vascular spaces were prominent. There was disagreement among the pathologists as to whether to call the tumor an osteogenic sarcoma or chondrosarcoma, the latter being finally accepted.

The post-operative course in the hospital was uneventful. Upon discharge, 1600 r units were administered over the left anterior thorax and 1400 r units over the left posteriort thorax. On October 16, 1952, he was started on 1,000,000 volt deep x-ray therapy.

There was a gradual downhill course. On February 27, 1953, roentgenogram of the chest revealed a homogeneous density over the entire left lung, shift of the heart to the right, a large metastatic nodule in the right base and several smaller ones in the right upper lung. There was a small amount of fluid in the right costophrenic angle. There were metastases to the ninth right rib posteriorly.

During this time there was progressive anemia requiring several transfusions, much weight loss, and the requirement of large amounts of opiates for pain. No fluid could be aspirated at any time. The patient expired March 24, 1953.

SUMMARY

There was no means of a preoperative diagnosis of this case of chondrosarcoma of the posterior mediastinum with symptoms and roentgenologic appearance of a dumbbell neurofibroma. The close proximity to the paravertebral gutter and the paresthesias experienced would make the diagnosis of a neurogenic tumor plausible.

There was indecision among the pathologists as to whether to call this tumor an osteogenic sarcoma or a chondrosarcoma. Since the cartilaginous tissue was much more abundant, the latter diagnosis was accepted.

The finding of any mediastinal tumor is important because they have a tendency to malignant changes and may compress the thoracic viscera. The majority of such neoplasms are malignant or potentially so.

RESUMEN

No hubo medios para hacer un diagnóstico preoperatorio en este condrosarcoma del mediastino posterior con síntomas y aspecto radiológico de un neurofibroma en forma de mancuernas. La proximidad acentuada al canal paravertebral y las parestesias harían posible el diagnóstico de un tumor neurogénico.

Hubo indecisión entre los patólogos respecto de si se podría llamar a este tumor un sarcoma osteogénico o condrosarcoma.
Puesto que el tejido cartilaginoso era más abundante, este último diagnóstico fue aceptado.

El hallazgo de cualquier tumor mediastinal es importante porque tienen tendencia maligna y pueden comprimir las vísceras torácicas. La mayoría de tales neoplasmas son malignos o potencialmente malignos.

RESUME

Il n'y eut aucun moyen de faire le diagnostic préopératoire de ce cas de chondrosarcome du médiastin postérieur, dont les symptômes et l'apparence radiologique étaient d'un neurofibrome en haltères. La très grande proximité de la gouttière paravertébrale et les paresthésies mises en évidence rendaient plausible de diagnostic de tumeur neurogène.

Les anatomo-pathologistes hésitèrent à désigner cette tumeur sous le terme de sarcome ostéogénique ou de chondrosarcome. La prédominance nette du tissu cartilagineux amena à pencher pour ce dernier diagnostic.

Toute constatation de tumeur médiastinale est importante, parce que de telles tumeurs ont tendance à l'envahissement, et peuvent comprimer les viscères thoraciques. Ces tumeurs dans leur majorité sont malignes ou ont un potentiel évolutif malin.

ZUSAMMENFASSUNG

Es gab keine Möglichkeit einer präoperativen Diagnose dieses Falles von Chondrosarcom des hinteren Mediastinums mit den Symptomen und dem röntgenologischen Aussehen eines hantelförmigen Neurofibroms. Die enge Nachbarschaft zum paravertebralen Winkel und die durchgemachten Parästhesien machten die Diagnose eines neurogenen Tumors plausibel.

Es bestand unentschlossenheit unter den Pathologen, ob dieser Tumor als ein osteogenes Sarcom oder als ein Chondrosarcom zu bezeichnen sei. Da das knorpelbildende Gewebe bei weitem überwog, wurde die letztegenannte Diagnose angenommen.

Der Befund eines jedes Mediastinal-Tumors ist von Wichtigkeit, weil sie die Tendenz zu malignen Veränderungen haben und die thorakalen Eingeweide komprimieren können. Die Mehrheit solcher Neubildungen ist bösartig oder hat die Fähigkeit dazu.

REFERENCES