Benign Fibroma of the Pleura

Report of Case

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Primary neoplasms of the pleura are uncommon lesions. Their importance lies in the fact that the advances in the field of thoracic surgery have made their successful removal possible.

Klemperer and Rabin¹ have divided these tumors into two main groups. The first is of diffuse lesions which may involve the entire pleura and completely envelop the lung. This type of new-growth arises in the membranous lining of the pleura and has been termed an endothelioma or mesothelioma. Some pathologists now feel this is a carcinoma. It is not amenable to surgery. The second group consists of solitary or localized growths that have their origins in the sub-endothelial connective tissues on the parietal or visceral side. It is this latter group that has surgical importance.

The parietal tumors are varied in type as they may originate from any of the structures beneath the pleura. Boyd² has described them as the most malignant of neoplasms because they invade the chest wall early and metastasize widely. They are usually spindle-cell sarcomas, angiosarcomas, liposarcomas, and neurosarcomas. Growths arising from the visceral side are usually chondromas, lipomas, or fibromas; the last of these is the tumor with which we are here concerned.

Small fibromas are occasionally found at autopsy as pedunculated masses attached to the edges of the lung.³ They have little clinical significance. However, some of them may grow to gigantic proportions such as the one that weighed 12 pounds which was reported by Seydel.⁴ These are of interest because they may be removed surgically, and if overlooked, they may cause death through mechanical interference with vital processes. The occurrence of such a neoplasm is so unusual that we feel this case should be reported. According to Belleville⁵, Unger encountered only five of these lesions in 33,000 necropsies. Belleville reviewed 44 case histories of this condition that had been recorded up to 1945.

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Report of Case

Miss E. F. (Hospital No. 180082), aged 40 years, was admitted to the Graduate Hospital on November 4, 1947, with chief complaints of shortness of breath and chest pain of two years duration. Onset of symptoms had followed a severe “cold,” and they had become more marked three months prior to admission. The dyspnea was mostly evident upon exertion, and she was unable to climb a flight of stairs without distress. The chest pain occurred in two sites. There was a sharp pain over the right lower chest which was intermittent and usually disappeared during bed rest. She also described a dull ache at the xiphisternal junction. The ingestion of solid food occasionally was followed by a “sticking sensation” at the lower end of the sternum. An inconstant, non-productive cough had been present for one year. Prolonged attacks of coughing accentuated the pain in the right lower chest. For several months the patient had noted swelling of both ankles following a day’s work. There was no history of weight loss. The past and personal histories were negative. Both parents had died of pneumonia.

Physical examination revealed an afebrile, white female in no apparent distress. The pulse rate was 80. The blood pressure was 110 mm. systolic, 70 mm. diastolic. The heart was not enlarged and no murmurs were present. The percussion note over the right lower chest was dull; this was noted below the third intercostal space anteriorly and below the inferior angle of the scapula posteriorly. The breath sounds were dim-

FIGURE 1: Antero-posterior bronchogram showing incomplete filling of right middle and lower lobe bronchi.
inished to absent over this area. Tactile and vocal fremitus were also diminished in this region. No rales were heard. Aside from moderate pitting edema of both legs, no other objective abnormalities were present.

Laboratory studies showed a normal blood count; hemoglobin was 72 per cent. Blood chemistry determinations were normal and the Wasserman test was negative. The electrocardiogram revealed low amplitude of the T waves.

The roentgenographic examination of the chest demonstrated a homogenous density that was obscuring the posterior portion of the right lower lung field. This radio-opacity extended up to the level of the seventh rib posteriorly. The right hemidiaphragm was not visualized. The remainder of the lung fields and the cardiovascular shadow appeared normal. Laminography gave no additional information except that rib involvement by the mass was absent. A bronchogram of the right middle and lower lobes was made by means of Lipiodol instillation (Figs. 1 and 2). Incomplete filling of the right middle and lower lobes with a crowding together and a displacement of the bronchi anteriorly and laterally was demonstrated. Although it was felt that the mass was intrathoracic in location, extension of a lesion arising in the liver could not be definitely excluded. Therefore, 400 ccm. of air were injected into the peritoneal cavity and erect films made (Fig. 3). The inferior surfaces of both hemidiaphragms were well outlined and the mass was shown to be entirely in the chest.

Endoscopic examination of the bronchi by Dr. Gabriel Tucker showed

FIGURE 2: Lateral bronchogram showing smooth radio-opacity displacing bronchi.
the right main stem bronchus to be compressed. The orifice of the right middle lobe bronchus was almost obliterated. Orifices of the right lower lobe bronchi were barely seen. No inflammatory signs were noted. Papa-
nicolau smears made of the secretions were negative for malignant cells.

Thoracotomy was performed on November 21, 1947, under endotracheal cyclopropane-ether-oxygen anaesthesia. The right seventh rib was re-
sected and the pleural cavity entered through its bed. A large and solid tumor was visible through the incision; so the right sixth and eighth ribs were sectioned posteriorly to obtain more adequate exposure. The pleural cavity contained about 500 ccm. of turbid, orange-colored fluid and some amorphous gelatinous material. The large tumor occupied the entire right lower hemithorax and the right lower lobe was compressed into a thin crescentic shell.

A large vein and a smaller artery coursed over the antero-lateral surface of the mass and continued through a dense adhesion into the right ninth intercostal space. There was a second dense adhesive band between the inferior surface of the tumor and the diaphragm. This band measured 2 cm. in length and 1 cm. in width. These attachments were divided and the tumor was lifted upward and outward for closer inspection. It was firm and well encapsulated by visceral pleura. The outer surface was slightly nodular except over the area adjacent to the diaphragm which was flat and smooth. The mass was attached to the postero-lateral surface of the lower lobe of the right lung by a pedicle about 3 cm. in diam-
eter. This attachment was friable and it separated from the lung paren-

FIGURE 3: Erect film taken after artificial pneumoperitoneum. Under surface of diaphragm visualized.
chyma during mobilization of the mass. It was necessary to suture the denuded area of lung because of brisk bleeding and escape of air from the alveoli. Further exploration of the right hemithorax revealed no other lesion. The lung was expanded by the anesthetist as the chest was closed.

The tumor measured 15.5 cm. by 10.5 cm. by 7 cm. Its weight was 1500 grams. It cut with difficulty due to its dense rubbery consistency. The cut surface was pinkish white with glistening gray streaks. There were many blood-filled sinuses and cystic areas containing gelatinous material. The cut surface was irregularly elevated and depressed due to retraction of the fibrous tissue. Histologically the tumor was composed of areas of marked cellular proliferation separated by strands of dense collagen fibers (Fig. 6). The predominant cell was the fibroblast. These were spindle-shaped and were not arranged in any particular order. Palisading of the nuclei and whorl formation were not present. No mitotic figures were noted. Scattered lymphocytes and monocytes were seen. The pathological diagnosis by Dr. Eugene A. Case was Benign Fibroma of the Pleura.

The patient made an uneventful recovery. Follow-up examination 10 months after operation showed complete expansion of the right lung. She was asymptomatic and discharging her occupational duties.

Discussion

This fibroma was typical of the group; and although smaller in size, it was identical in other respects to those reported by Belleville, Fawcett, Boyd, Mintz, Lilienthal, and Klemperer and Rabin.
These tumors are observed at any age level and are slightly more common in women. There is little difference in the incidence of origin in the right or left thoracic cavities. There is some difference of opinion as to whether the giant fibromas arise from the parietal pleura. In most instances they are completely invested with visceral pleura and are attached to the lung by a small pedicle. It is likely that adhesions to the diaphragmatic and costal pleura form secondarily and make it difficult to determine the exact origin. On the other hand, the small pedicle and friable bands facilitate removal. This was noted in the case herein reported.

These masses are solid and irregular in shape. They are compressed to conform to the space where they are found. Lobulation may be present. The color may range from glistening white to gray. They are characterized by slow growth, and it is evident that they may attain great proportions. In one case autopsied at the Massachusetts General Hospital, a fibroma arising from the mediastinal pleura was found to occupy the entire hemithorax; Mallory estimated its weight at 20 pounds.

At first these tumors were called giant sarcomas because the microscopic picture was often that of a fibrosarcoma. Some were described as spindle-cell sarcomas with areas of less cellular activity resembling simple fibromas. Tumor giant cells and mitotic figures were occasionally seen. These were not noted in our case, but perhaps they were present in a section of the tumor that was

FIGURE 5: Cut surface of the tumor.
not studied. Whether classified as sarcomas or fibromas, they behave as benign lesions. Justification for this conclusion lies in the facts that they are surrounded by a connective tissue capsule, grow slowly to a great size, are not invasive, and do not metastasize. The histological picture of these tumors differs from that of the perineural fibroblastomas, because the cellular architecture of the latter is regular with palisading of the nuclei, whorl and eddy formation, and less collagen.

The symptoms and signs of the lesion are easily understood. Mechanical interference with respiration and circulation takes place as with any space-taking mass in the chest. Non-productive cough, dyspnea, chest pain, and distended neck veins may occur. Pressure on the lower esophagus may have caused the dysphagia in our case. Also the pretibial edema may have been due to interference with circulatory return. Both of these have disappeared since operation. Febrile reactions may occur secondary to pneumonitis in the compressed lung parenchyma. Pleuritic pain may be due to small hemothorax secondary to spontaneous rupture of the distended veins on the surface of the tumor. Pressure of the tumor and erosion of the ribs may also cause pain.

Roentgenography is the most important adjunct to the diagnosis of this condition. The picture is that of a uniformly dense opacity
with a spherical contour and a sharp outline. Invasion of the hilar area is not noted. Compression of the lung tissue with little or no inflammatory change is seen. If pleural fluid is also present, the film may be interpreted as a loculated or encysted effusion, as in the case reported by Mintz. If the lesion is present in the lower chest, a rhabdomyoma of the diaphragm cannot be excluded. In the case reported by Tobias, the weight of the mass had caused an inversion of the diaphragm, and the lesion appeared to be intra-abdominal. Artificial pneumothorax or pneumoperitoneum may be of great value in defining the limits of the tumor. This was borne out by our case, because of neoplasm of the liver could not be ruled out until the upper surface of the liver was defined by air.

Bronchoscopic examination is necessary to differentiate this condition from one of intra-bronchial origin.

The only therapy is surgical intervention with complete removal of the fibroma. The prognosis is good. Recurrence has been reported after partial excision of these tumors.

**SUMMARY**

1) Primary neoplasms of the pleura may be divided into two main groups: one of diffuse lesions involving the entire pleura; and one of solitary, localized growths originating in the subendothelial connective tissues on the parietal or visceral side. The latter tumors are as varied as the tissues from which they originate.

2) Large benign fibromas of the pleura are rare; only 44 had been recorded up to 1945.

3) A case of benign fibroma of the pleura is reported. This tumor was resected, and the patient made an uneventful recovery. The mass weighed 1500 grams.

4) The symptoms and signs of these tumors are those of a space-taking lesion in the thorax. Mechanical interference with respiration and circulation occur.

5) Some have called these tumors giant sarcomas, but they usually behave as benign lesions. They appear to grow slowly to great size, do not invade adjacent tissues, and do not metastasize.

6) Roentgenography of the chest is most important in the diagnosis of these lesions. Bronchoscopy is also of value. The importance of artificial pneumothorax or pneumoperitoneum and subsequent roentgenography in ruling out intra-abdominal pathology is discussed.

7) Good results are obtained with complete removal of the fibroma. Recurrence has been reported after partial excision.
RESUMEN

1) Las neoplasmas benignos de la pleura pueden dividirse en dos grupos principales; uno de lesiones difusas que abarcan toda la pleura y el otro de neoformaciones solitarias localizadas a partir del tejido subendotelial conectivo en el lado parietal o en el visceral.

Estos últimos tumores son tan diversos como son los tejidos de que originan.

2) Los fibromas benignos grandes de la pleura son raros; solo 44 se han referido hasta 1945.

3) Se relata un caso de fibroma benigno de la pleura. Este tumor fue resecado y el enfermo se recuperó sin incidentes. El tumor pesaba 1500 gramos.

4) Los síntomas y los signos de estos tumores son los de los padecimientos que invaden el espacio de la caja torácica. Hay interferencia mecánica con la respiración y la circulación.

5) Algunos han llamado a estos tumores sarcomas gigantes, pero se conducen como tumores benignos. Parece que crecen lentamente hasta llegar a gran tamaño, no invaden los tejidos vecinos y se metastatizan.

6) Para el diagnóstico de estos tumores la radiografía es lo más importante. La broncoscopia es también de valor. Se discute la importancia del neumotórax y del neumoperitoneo para diferenciar de las neoformaciones intrabdominales.

7) Se obtienen buenos resultados con la completa extirpación del fibroma. Después de resección parcial se han referido recurrencias.

REFERENCES