Chondromyxoid Fibroma of Rib*
Report of an Unusual Benign Primary Tumor

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Metastatic tumors in ribs are fairly common and if the primary neoplasm is recognized the diagnosis of metastasis is usually not difficult and can be confirmed by aspiration biopsy. Primary tumors in ribs, on the other hand, are much less common and frequently no definite diagnosis can be made until the neoplasm is resected and submitted to a competent pathologist.

In reviewing the available literature one is impressed with the relative scarcity of reported primary tumors in ribs. Over a period of 20 years Janess of Toronto encountered only eight primary tumors in ribs. There are two reports in the recent literature which bring the material on primary tumors in ribs to date: in 1942 Sommer and Major collected 66 cases of proved primary neoplasms in ribs reported since 1933 and added 15 of their own from the University of Michigan Hospital; and in 1948 Dorner and Marcy collected 47 cases of proved primary tumors and tumor-like lesions in ribs reported since 1942 and added eight of their own which they encountered over a 12-year period at the University of Iowa Hospital. As indicated in the table, less than half of the lesions in the group of 55 cases reported by Dorner and Marcy were true neoplasms; the remaining lesions were classified as fibrous dysplasia, a term introduced by Lichtenstein to describe a perfectly benign lesion of the bone which is not a neoplasm but which results from perverted activity of the specific bone-forming mesenchyme. The 24 primary tumors of the rib comprising the group of Dorner and Marcy were represented by the following: chondrosarcoma eight, osteochondroma four, fibrosarcoma, chondroma and hemangioma two of each, osteosarcoma, lymphocytoma, osteoid osteoma, plasmocytoma, osteochondrosarcoma and osteochondromyxosarcoma one each. A case of osteochondroma of the first rib producing Horner's syndrome was reported in 1948. The total number of proved primary tumors in ribs reported since 1933 is only 106.

Where no diagnosis is available and primary rib tumor is suspected surgical exploration is preferable to watchful waiting so as not to overlook a frankly malignant tumor or one in the pre-

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CHONDROMYXOID FIBROMA OF RIB

Series collected by Dorner and Marcy

<table>
<thead>
<tr>
<th></th>
<th>Fibrous dysplasia 6,10 (31 army personnel)</th>
<th>Primary tumors of rib (24 civilians)</th>
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<tbody>
<tr>
<td>Sex</td>
<td>Male 30</td>
<td>Female 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>19-37</td>
<td>11-65</td>
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<tr>
<td>Ribs</td>
<td>Mostly lower</td>
<td>Mostly lower</td>
</tr>
<tr>
<td>Initial symptoms- swelling &amp;/or tenderness</td>
<td>About 1/2 of cases</td>
<td>All cases</td>
</tr>
<tr>
<td>Duration of symptoms</td>
<td>2 mos. to 8 yrs.</td>
<td>6 mos. to 50 yrs.</td>
</tr>
<tr>
<td>History of trauma</td>
<td>About 1/3 of cases</td>
<td>?</td>
</tr>
<tr>
<td>Treatment</td>
<td>Resection in all</td>
<td>Resection in all but 3</td>
</tr>
<tr>
<td>Postoperative follow-up</td>
<td>Up to 3 yrs.</td>
<td>1 mo. to 12 yrs.</td>
</tr>
<tr>
<td>Results</td>
<td>No recurrence</td>
<td>No recurrence 13 (2 mos. 12 yrs.)</td>
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<td></td>
<td></td>
<td>Died 6 (1-21 mos., all sarcomas)</td>
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<td></td>
<td>Unknown 5</td>
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malignant stage; malignant degeneration of chondroma and osteochondroma is regarded as frequent enough to justify early and definitive therapy. Definitive therapy of primary tumors of the ribs is no longer a controversial matter; irradiation therapy is of no real value; early and wide excision is the treatment of choice; by this is meant removal of the tumor including periosteum, underlying parietal pleura and adjacent intercostal structures. The patient whose case report is to follow was handled by such an excision.

Case Report: A. L., a 39 year old white male, was first seen on December 12, 1948 because of vague pains in the region of the left lower chest posterolaterally and because x-ray inspection disclosed an abnormal shadow. The onset of the pain which was mild and never disabling was in October 1941 while he was employed as a laborer in a steel plant. In January 1942 he had an x-ray examination and urinalysis by the plant physician and was told to sleep on a hard bed. From 1943 to 1945 he served in the Army; he continued to complain intermittently and was treated with diathermy; his chest was x-rayed on induction and on discharge but no comment was made. On August 18, 1947 a 4 x 5 inch miniature chest roentgenogram was made by one of the health agencies in the course of a survey and on March 25, 1948 this examination was repeated by another agency in connection with the patient's application for a civil service position. Both were interpreted as "normal chest." These miniature films made seven months apart are the only ones obtainable, Figure 1, and reveal the same lesion which obviously was overlooked because of partial overlapping by the heart shadow.

When seen on December 12, 1948 the patient stated that there was no
change in the character of the intermittent pain since its onset seven years ago and he appeared to be free of any abnormal physical finding. At this time a posteroanterior chest roentgenogram, Figure 2, showed a fracture with slight displacement and callus formation in the right ninth rib posteriorly and a dense shadow three inches in diameter at the level of the left ninth rib and overlapping the left heart border identical with that seen in the earlier roentgenograms. In the left lateral projection, Figure 3, the dense shadow was seen at the posterior chest wall and a roentgenogram of the spine and ribs, Figure 4, revealed a lesion involving the rib itself.

**FIGURE 1**

*Figure 1:* The roughly spherical tumor involving the posterior portion of the left 9th rib projects from behind the left heart border.  
*Figure 2:* Fracture of right 9th rib along posterior axillary line. Appearance of tumor in left 9th rib is unchanged.

**FIGURE 2**


**FIGURE 3**

*Figure 3:* Spherical tumor situated posteriorly.  
*Figure 4:* Overexposed film showing the callus in the right 9th rib and the tumor in the left 9th rib.
The preoperative diagnosis was primary neoplasm of the left ninth rib, nature unknown, and traumatic fracture of the right ninth rib. The fracture was at first suspected of being a pathological one, but because the miniature roentgenograms of 1947 and 1948 did not show any abnormality in the right ninth rib and because further questioning elicited a history of recent wrestling following which the right hemithorax had to be taped, the idea of pathological fracture was abandoned. The radiologist's diagnosis was fracture of the right ninth rib and giant cell tumor of the left ninth rib.

Because the true nature of the tumor was uncertain it was decided to remove it. On January 10, 1949 exploration under intratracheal anesthesia was performed. The tumor was found to project anteriorly and to involve the left ninth rib from the angle to the tip of its head. Short sections of the rib above and below were resected subperiosteally to get adequate exposure and the neoplasm was removed together with about an inch of uninvolved rib and the underlying periosteum and pleura and adjacent intercostal structures. Considerable bleeding was encountered in detaching the tumor from the body of the vertebra against which it was plastered. The wound was closed without a drain.

The postoperative course was smooth; a chest roentgenogram on the sixth postoperative day revealed an opacity over the operative field which gradually cleared up following a single aspiration of 720 c.c. of serosanguinous fluid which was sterile on culture and which did not recur. The most recent roentgenograms October 18, 1949 of the chest, spine and ribs revealed no evidence of recurrence of the neoplasm, Figures 5, 6 and 7, and the patient remains asymptomatic.

The pathologist's report * was as follows: the specimen, Figure 8, consists of a fairly well circumscribed partly lobulated tumor mass measuring 6.5 cm. in maximum diameter. The external surface is smooth except for some adherent fatty tissue. The tumor is cystic. The wall is very thin and bony, having in places an egg shell appearance. The central cystic space contains bloody fluid, some of which is coagulated. Within the cystic space there are also fragments of pale reddish-gray tissue, some of which are adherent to the lining aspect. The lining is rough and partly trabeculated. The cut surface of the rib suggests that the lesion is expanded from the central medullary portion and the wall of the cyst actually is the expanded cortex. Close to the large cystic lesion within the central portion of the rib there are several small cystic spaces also filled with bloody fluid.

Microscopic examination of multiple sections, Figures 9 and 10, of the cystic tumor mass submitted for study shows in each of the sections an essentially similar histologic picture. The tumor is composed mainly of poorly developed cartilaginous tissue which in places is degenerated in appearance. The cartilaginous matrix is quite variable. Some of it is acidophilic. There are also irregular

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†When last seen in April 1951, physical condition and x-ray findings remained unchanged.
FIGURES 5, 6 and 7: No evidence of recurrence of the neoplasm, and the patient remains asymptomatic.
blotches of basophilic mucinous change in the matrix. The nuclei are uniform in size, predominantly small, spindle-shaped, stellate and ovoid. They show no appreciable degree of pleomorphism. Included in the sections are some of the cystic spaces noted grossly. These are lined in part with fatty tissue containing numerous macrophages laden with hemosiderin. The section taken from the periphery of the lesion required decalcification. In this one there are trabeculae of fairly well preserved bone. Here the cystic spaces are lined with a layer of degenerated blood and the walls of the cystic spaces consist mainly of dense fibrous partly hyalinized connective tissue.

The pathologist’s diagnosis: chondromyxoid fibroma of rib.

Discussion

Jaffe and Lichtenstein who coined this term point out that this benign tumor represents a peculiarly differentiated connective tissue neoplasm exhibiting certain chondroid and also myxoid traits which make it likely to be mistaken especially for chondrosarcoma. This lesion has been reported in the literature only twice before: in 1948 Jaffe and Lichtenstein reported a series of eight cases encountered over a period of seven years at the New York Hospital for Joint Diseases and Stratford of North Carolina in the same

*Confirmed by the American Registry of Pathology of the Armed Forces Institute of Pathology.
FIGURE 9: Section through entire neoplasm: low power.

FIGURE 10: Photomicrograph of a section of the tumor showing the chondroid and myxoid tendencies.
year reported a single case. All of these tumors were in some bone of a lower extremity and no recurrences were observed following curettage over as long a period as seven years. According to Lichtenstein the case described in this paper is the first chondromyxoid fibroma of the rib to be recognized as such. Despite the fact that the earliest chest roentgenogram available antedates the resection only by 17 months, it seems probable that the tumor dates back to the onset of symptoms seven years prior to the resection.

SUMMARY

A case of chondromyxoid fibroma of the rib is presented and discussed.

RESUMEN

Se presenta y discute un caso de fibroma condromixoide de la costilla.

RESUME

Les auteurs rapportent un cas de fibrom echondromyxoide de la côte et font un court exposé de la question.

REFERENCES

2 Coley, B. L.: Discussion of Copeland and Geschickter,^1 p. 733.
9 Lichtenstein, L.: Personal communication.