

Mesenchymal Chondrosarcoma Arising from the Periosteum of the Rib : A Case Report¹

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We describe a case of mesenchymal chondrosarcoma arising from the periosteum of the rib. On chest radiograph the mass showed well-defined radiopacity, and there was rib erosion. On CT, there was marked enhancement with irregular ossification and rib erosion, while a ^{99m}Tc-MDP scan revealed dense radionuclide uptake.

Index words : Ribs, neoplasms
Thorax, CT
Sarcoma

Mesenchymal chondrosarcoma, first reported by Lichtenstein and Bernstein in 1959 (1), has been described as an uncommon, aggressive variant of chondrosarcoma with a strong tendency to metastasize to distant sites (2). It is characterized by undifferentiated mesenchymal cells, islands of malignant cartilage differentiation, and frequently areas resembling vascular bone tumors (1). We describe a rare case of mesenchymal chondrosarcoma arising from the periosteum of the rib.

Case Report

A 26-year-old woman presented with intermittent left chest pain of six-month duration. Chest PA showed a 4 × 5 cm soft tissue mass with abutting rib erosion in the left upper lung field (Fig. 1A). Chest PA obtained fifteen months previously was also available, and showed a 2 cm nodule with subtle rib erosion in the left upper lung field.

On pre-contrast CT, a well-defined, lobulated mass was seen. It was about 4 × 4 × 5 cm in size, showed low attenuation, and was broad based on the inner as-

pect of the body of the 5th rib. It had irregular ossifications in its base and eroded the abutting rib (Fig. 1B). On contrast-enhanced CT, it was markedly enhanced and a few small central areas of low attenuation were seen (Fig. 1C). ^{99m}Tc-MDP bone scintigraphy revealed dense radionuclide uptake (Fig. 1D).

Surgery revealed a well-marginated, lobulated solid mass arising from the periosteum of the 5th rib and easily separated from the lung. Its removal involved partial rib resection. Cut section showed the mass to be grayish-yellow and of hard consistency (Fig. 1E). Gross irregular ossifications were seen in its peripheral portion and a few small hemorrhagic foci were present in its center. Histologic examination showed that it arose from the periosteum of the rib and consisted of small mesenchymal cells and malignant cartilage. In some areas, cells clustered around vessels in a way similar to that which occurs in hemangiopericytoma (Fig. 1F). These findings were consistent with mesenchymal chondrosarcoma.

Discussion

Mesenchymal chondrosarcomas are common during the second and third decades, with no predilection for gender. They usually arise from the bones, but extra-skeletal occurrence is more common than in the case of other chondrosarcomas. Common sites of skeletal mesenchymal chondrosarcomas are the femur, ribs, jaws, spine and, pelvis (3).

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Most mesenchymal chondrosarcomas are seen on plain radiograph to be predominantly lytic. Their granular calcifications and poorly defined ossi-

fications sometimes suggest a malignant cartilage tumor. A mesenchymal chondrosarcoma rarely arises from the periosteum, as in our case. Plain film can

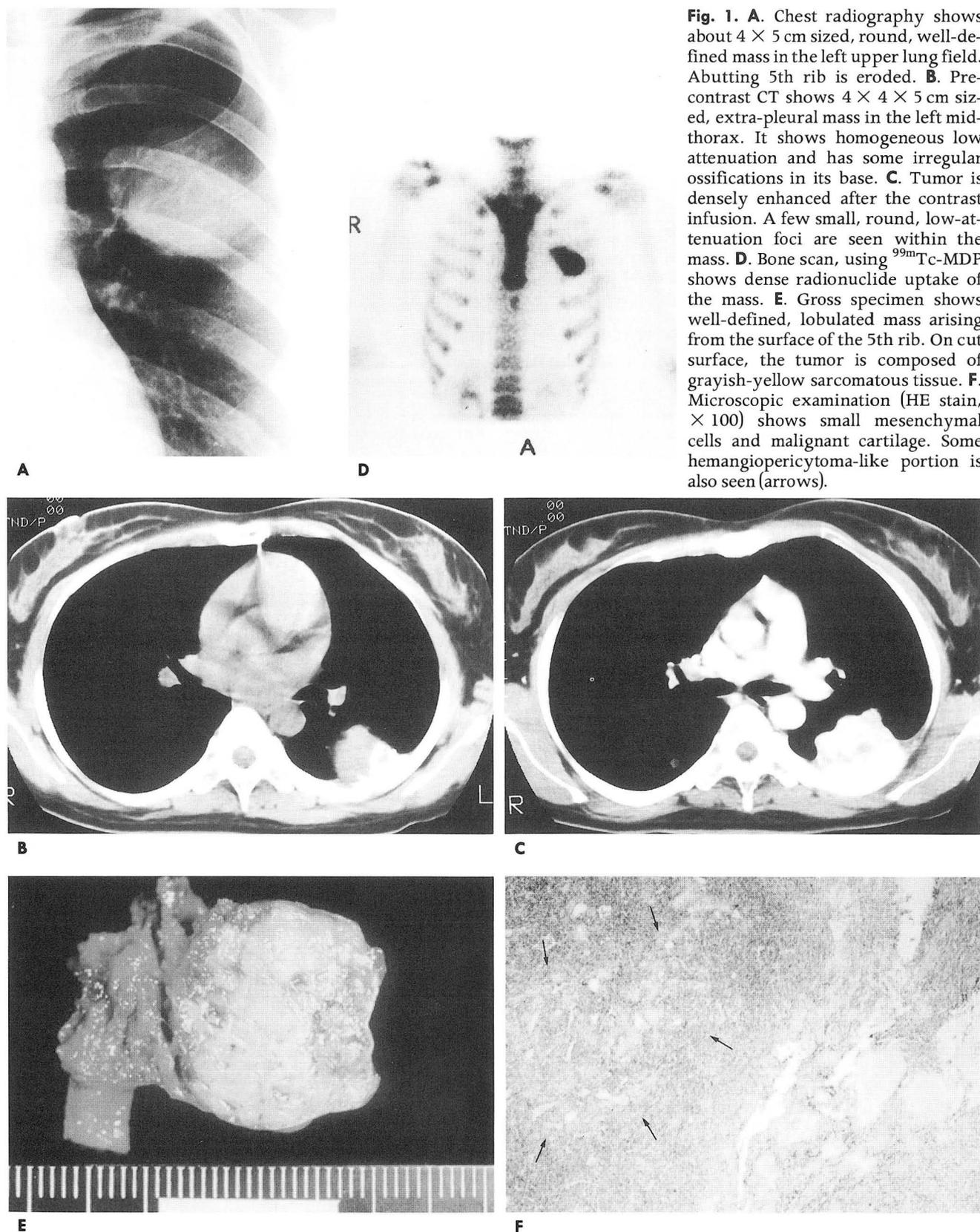


Fig. 1. **A.** Chest radiography shows about 4 × 5 cm sized, round, well-defined mass in the left upper lung field. Abutting 5th rib is eroded. **B.** Pre-contrast CT shows 4 × 4 × 5 cm sized, extra-pleural mass in the left mid-thorax. It shows homogeneous low attenuation and has some irregular ossifications in its base. **C.** Tumor is densely enhanced after the contrast infusion. A few small, round, low-attenuation foci are seen within the mass. **D.** Bone scan, using ^{99m}Tc-MDP shows dense radionuclide uptake of the mass. **E.** Gross specimen shows well-defined, lobulated mass arising from the surface of the 5th rib. On cut surface, the tumor is composed of grayish-yellow sarcomatous tissue. **F.** Microscopic examination (HE stain, × 100) shows small mesenchymal cells and malignant cartilage. Some hemangiopericytoma-like portion is also seen (arrows).

show small saucer-like erosions of the underlying cortex and a large juxtacortical lobulated soft tissue mass with or without calcification. A periosteal mass is sometimes predominantly lytic (4, 5). In our case, a well-defined, soft-tissue density mass with focal rib erosion was seen on plain radiograph.

CT helped characterize the nature of the mass. Ossification was readily apparent and helped narrow the range of differential diagnosis. The entire mass was densely enhanced after contrast infusion, and this suggested a hypervascular tumor. Several small non-enhanced foci, considered to be necrosis or hemorrhage, were histopathologically confirmed.

A bone scan in our case showed dense radionuclide uptake by the mass, a phenomena which as we know as far has not been described in other studies. Bone scan findings may be similar to those for other malignant bone tumors (6). Malignant chondroid cartilage is the main component of the mass, and is the matrix for chemisorption of pyrophosphate of radioisotope. Mesenchymal chondrosarcoma also has a hemangiopericytic component: rich vascular channels promoting radionuclide uptake by the tumor.

Differential diagnoses for periosteal mesenchymal chondrosarcoma may include juxtacortical tumors such as periosteal chondroma, chondrosarcoma, and various soft tissue sarcomata with calcification (7). Periosteal chondroma usually occurs in the metaphyses of long tubular bone and shows a soft tissue

mass, with the erosion of adjacent cortex. Patients with juxtacortical chondrosarcoma are usually old and the tumor tends to be large. Imaging findings of such tumors are, too similar for successful differentiation.

Although periosteal mesenchymal chondrosarcoma is extremely rare, this entity might be considered when radiologic findings in a young adult are a rapidly growing, well-enhanced, juxtacortical tumor with calcification and irregular ossification.

References

1. Lichtenstein L, Berstein D. Unusual benign and malignant chondroid tumors of bone. *Cancer* 1959; 12: 1142-1157
2. Harwood AR, Krajbica JL, Fornasier VL. Mesenchymal chondrosarcoma: a report of 17 cases. *Clin Orthop* 1981; 158: 144-148
3. Nakashima Y, Unni KK, Shieves IC, Swee RG, Dahlin DC. Mesenchymal chondrosarcoma of bone and soft tissue: a review of 111 cases. *Cancer* 1986; 57: 2444-2453
4. Bertoni F, Picci P, Bacchini P, et al. Mesenchymal chondrosarcoma of bone and soft tissues. *Cancer* 1983; 52: 533-541
5. Aoki T, Watanabe M, Takagi K, Tanaka S, Aida S. Mesenchymal chondrosarcoma of the rib: report of a case. *Surg Today* 1996; 26: 1020-1023
6. Hicks JR. Nuclear medicine techniques provide unique physiologic characterization of suspected and known soft tissue and bone sarcomas. *Acta Orthop Scand (Suppl 273)* 1997; 68: 28-36
7. Yochum TR, Rowe LK. *Tumors and tumor like processes. In essentials of skeletal radiology.* Volume 2. Williams & Wilkins. Baltimore, 1996: 975-1191

늑골 골막에서 발생한 간엽성 연골육종: 1예 보고¹

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간엽성 연골육종(Mesenchymal Chondrosarcoma)은 연골육종의 드문 변형으로 악성도가 높고 전이를 잘한다. 조직학적으로 미분화된 간엽성 세포와 악성연골, 그리고 혈관 종양성 병변으로 이루어져 있다. 저자들은 늑골의 골막에서 발생한 간엽성 연골육종을 경험하였기에 문헌고찰과 함께 보고한다. 단순촬영에서 병변은 경계가 분명한 등근연부 조직 종괴로, 접하는 늑골을 미란 시켰으며, 전산화 단층촬영에서는 접하고 있는 늑골 주변부에 불규칙한 골화가 있는 조영증강이 매우 잘되는 종괴였고, 골스캔에서는 강한 방사선 핵종의 섭취가 보였다.

국외개최 학술대회 [IV]

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