Calcifying Fibrous Pseudotumor of Mediastinum
- A case report -

This report presents a case of calcifying fibrous pseudotumor arising in the posterior mediastinum of a 54-year-old woman. The histopathologic features of this case were identical to that of calcifying fibrous pseudotumor first designated in 1993. It is a distinctive benign fibrous lesion characterized by the presence of characteristic psammomatous or dystrophic calcification, abundant hyalinized collagen and lymphoplasmacytic cell infiltrate. Immunohistochemically most of the scattered fibroblasts were positive for vimentin, but not for CD-34 and cytokeratins, distinguishing it from solitary fibrous tumor of pleura and desmoplastic mesothelioma. The unusual site of the posterior mediastinum and the old age characterize this case.
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Key Words : *Calcifying fibrous pseudotumor, Mediastinum, Psammoma body*

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INTRODUCTION

The new histopathological term "calcifying fibrous pseudotumor (CFT)", was first coined by Fetsch et al.(1). They reported 10 cases and added 2 cases previously reported as "childhood fibrous tumor with psammoma bodies" by Rosenthal and Abdul-Karim (2). Recently, 3 cases of CFT were described in the pleura by Pinkard et al.(3). The age of previously reported 15 cases ranged from 1 to 34 years, and the sites of occurrence were the extremities (5 cases), pleura (3 cases), back (2 cases), scrotum (2 cases), groin (1 case), neck (1 case), and axilla (1 case). We herein present a case of calcifying fibrous pseudotumor which developed insidiously in the posterior mediastinum of a 54-year-old woman and had the characteristic features of calcifying fibrous pseudotumor. The older age of this patient suggests the rather broad range of age of occurrence of this tumor, from 1 to 54 years. Although the mediastinum is an unusual site, the calcifying fibrous pseudotumor can develop in any site.

CASE REPORT

A 54-year-old woman presented with a posterior mediastinal mass found incidentally on simple chest radiograph. She had no symptoms and signs associated with the mass. There was no family history of a similar tumor. Physical examination could not disclose any tumor-associated finding. Computed tomography of the chest demonstrated a well demarcated calcifying mass in the posterior mediastinum (Fig. 1). There was no evidence of local invasion or metastasis. She underwent thoracotomy for complete removal of the mass (Pathology No : S92- 318). The mass was located in the apex of the right thoracic cavity and was well circumscribed, round, and tightly attached to the posterior mediastinal wall, the second rib and thoracic vertebrae. It was clearly separated from the right lung and visceral pleura. The

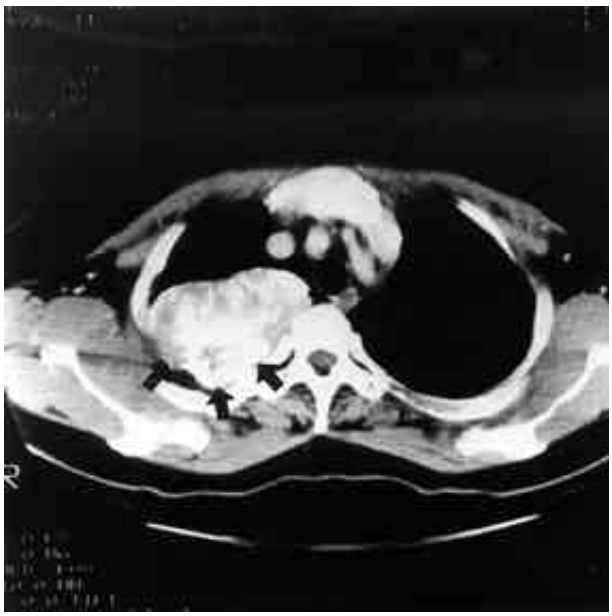

Fig. 1. Computed tomograph : A well demarcated mass(arrows) was present in the apex of right thoracic cavity with extensive internal calcification.

patient's subsequent course has been unremarkable 49 months after the operation. There were no features of residual or metastatic disease.

MATERIALS AND METHODS

The tissue was fixed in 10% neutral buffered formalin. Before sectioning, the tissue was decalcified for 1day in a solution of 10% formalin saturated with ethylenediamine tetracetate (EDTA). Five-micrometer sections were cut and stained with hematoxylin and eosin, Masson's trichrome and Congo red. Immunohistochemical staining was performed on paraffin-embedded tissue sections. The sections were stained by a standard avidin-biotin complex method using monoclonal antibodies to vimentin (VIM, Novocastra, Newcastle, UK), CD-34 (QB-END/10, Novocastra, Newcastle, UK), desmin (DES, Novocastra, Newcastle, UK), smooth muscle actin (SMA, Novocastra, Newcastle, UK), cytokeratins (PAN-CK, Novocastra, Newcastle, UK), epithelial membrane antigen (EMA, Dakopatts, Denmark), and S-100 protein (S-100, Dakopatts, Denmark).

RESULTS

The removed mass was globular, well circumscribed, and stony hard. It measured 8.5×6×5cm and weighed 320gm. The outer surface was smooth but not encapsulated. A resected segment of the 2nd rib was tightly attached to the outer surface of the mass. Cut surface was relatively homogeneous and gray white with scattered multiple fine yellow gritty specks (Fig. 2). Microscopically, the tumor was composed mainly of abundant, dense, and amorphous hyalinized bands of collagen. Uniform, elongated fibroblasts without atypia were scattered among the collagenous bundles and were more prominent at the periphery of the tumor. There were multiple round to oval concentrically laminated psammomatous bodies and amorphous dystrophic calcifications of variable size and shape (Fig. 3～5). Another prominent feature was lymphoplasmacytic infiltrates with multifocal lymphoid aggregates (Fig. 6). Thick collagen bundles stained deep blue with Masson's trichrome. No amyloid was demonstrated on Congo red stain. Immunohistochemically, most of the scattered fibroblasts were positive only for vimentin but negative for CD-34, epithelial membrane antigen, cytokeratins, smooth muscle actin, S-100 protein, and desmin.

DISCUSSION

We experienced a tumor of a 54-year-old woman showing a distinctive histopathologic feature, consisting of abundant dense hyalinized collagen bundles, multiple concentrically laminated psammoma bodies, irregularly shaped dystrophic calcification, sparsely scattered fibroblasts and infiltrates of lymphoplasmacytic cells. The

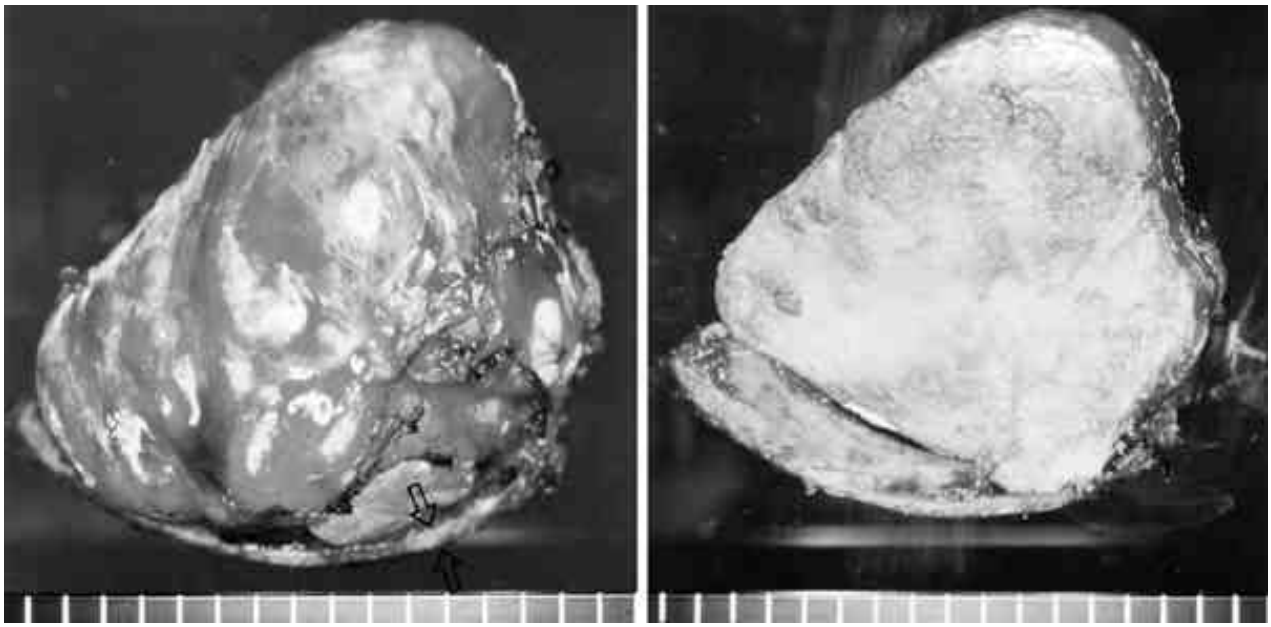

Fig. 2. Left : A well circumscribed stony hard mass, measuring 8.5×6×5cm which is tightly attached to the rib(arrows). Right : The cut surface was homogeneously gray white with scattered multiple light yellow speckles.

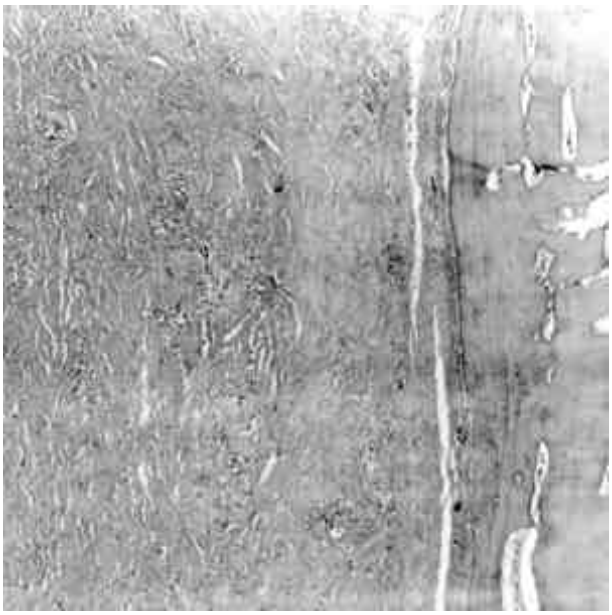

Fig. 3. The sharply circumscribed and extensively collagenizing tumor, which was attached to the bone.

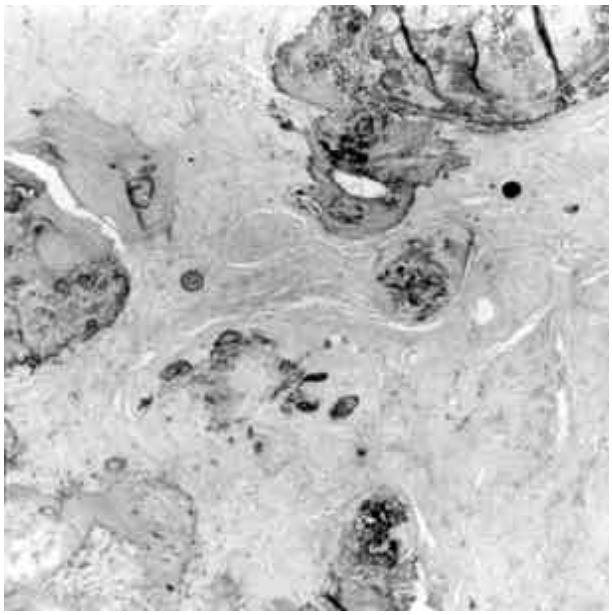

Fig. 4. Scattered amorphous dystrophic calcifications of variable size and shape with dense collageneous stroma.

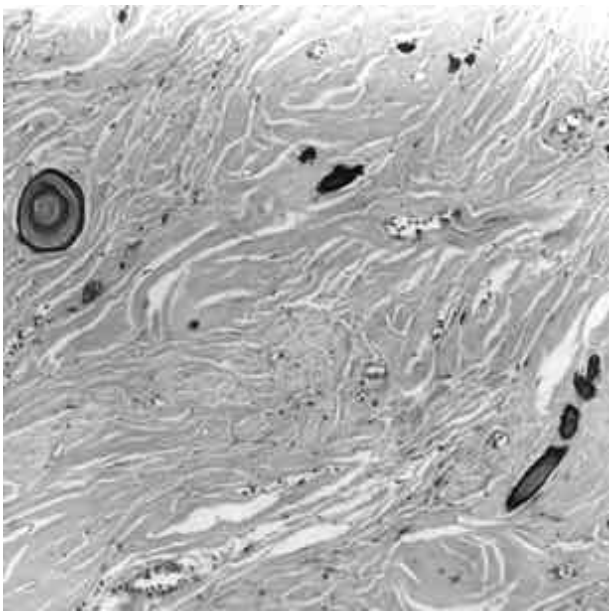

Fig. 5. Deeply eosinophilic hyalinized dense collagenous bundles with oval concentrically laminated psammomatous calcification.

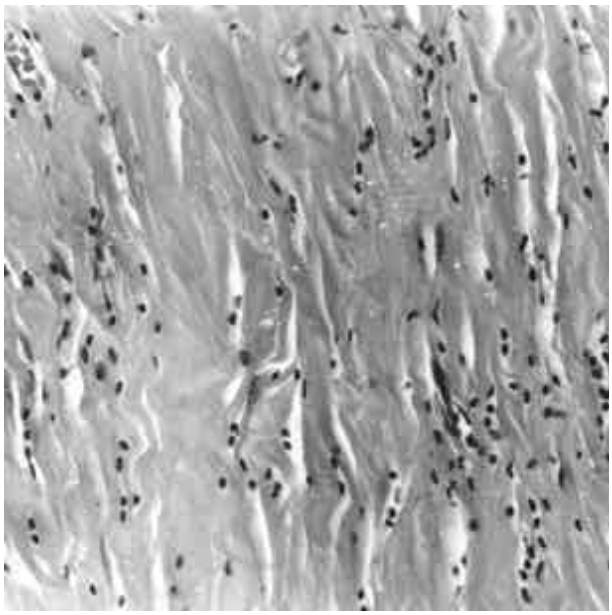

Fig. 6. Diffuse but sparse lymphoplasmacytic infiltrates.

histopathologic feature of this tumor was almost identical to that of the soft tissue lesion previously reported by Rosenthal and Abdul-Karim (2) as "childhood fibrous tumor with psammoma bodies" and by Fetsch et al.(1) as "calcifying fibrous pseudotumor (CFT)". Recently, 3 cases of CFT were described in the pleura (3). The old age in this case and the broad range of the age in the cases previously reported cases suggest that the term, "childhood", might be inappropriate for this tumor. In addition, we could reach a conclusion that this tumor develops at any site including body cavity (Table 1). With complete excision or enucleation, therapy was completed and the patient had no recurrence or metastasis 49 months later.

Pseudotumors, as reported in the lung and a variety of other sites, exhibit rather diverse histologic features (4

Table 1. Summary of previously reported cases and present case.

Case	Age(yrs)	Sex	Location	Size(cm)	Recurrence/Follow-up(mo)
1	24	F	Forearm	3.8	- / 2
2	33	F	Axilla	14	NA
3	9	F	Back	6.5	yes after 7 years/125
4	25	F	Lower leg	12	NA
5	2	M	Thigh	3.5	- /15
6	18	M	Groin	7	NA
7	19	M	Intrascrotal	3.4	- /48
8	1	M	Back	3.5	- /47
9	11	F	Neck	15	- /36
10	20	M	Intrascrotal	2.5	NA
11	2	F	Thigh	5	- /72
12	11	F	Forearm	6	- / 6
13	23	F	Pleura	1.5-12.5, multiple	-/ 9
14	28	F	Pleura	6.5,1.2 , two	-/12
15	34	M	Pleura	4	NA
16	54	F	Mediatinum	8.5	-/49

NA; not available
Cases 1-10; Fetsch et al. (1993)
Cases 11,12; Rosenthal and Abdul-Karim (1988)
Cases 13-15; Pinkard et al. (1996)
Case 16; Present case

~7). Many examples are fibroblast-rich with a variable number of lymphoplasmacytic infiltrate with occasional other inflammatory cell elements, especially histiocytes. The spectrum of pseudotumor also includes the less conspicuous fibroblastic cellular lesions with abundant dense hyalinizing collagen. According to Yousem and Hochholzer (8), if fibroblast-rich inflammatory pseudotumor is an early manifestation, so-called pulmonary hyalinizing granuloma, a fibrosing lesion characterized by thick ropy whorled collagen bundles, is a late manifestation of inflammatory pseudotumor. We agree with the idea of Fetsch et al.(1) that the histologic features of CFT are within the broad spectrum described for pseudotumor and believe that it is a biologically late manifestation of pseudotumor. Because of its characteristic histopathologic features, CFT is quite distinct from other reactive or neoplastic entities, nodular fasciitis, fibroma of tendon sheath, calcifying aponeurotic fibroma, solitary fibrous tumor, pulmonary hyalinizing granuloma, fibroxanthoma and lymphoplasmacytic type of inflammatory pseudotumor (4~9). Especially, this case had to be separated from a variety of parietal pleural lesions, including solitary fibrous tumor of pleura, desmoplastic mesothelioma, old calcified granulomas and chronic fibrous pleuritis (3, 9). Fibrous tumors of pleura are localized tumors that can have areas of dense hyalinized fibrous tissue similar to CFT. Histologically, most fibrous tumors shows a tangled network of fibroblast-like cells and deposition of abundant collagen fibers, many of which have a keloid-like quality. But, it is uncommon for calcification and chronic inflammation to be detected in fibrous tumors of the pleura by histologic examination. England et al.(5) described calcification in 12 (5%) of 223 solitary fibrous tumors of pleura, and psammomatous calcification was found in only one case. Immunohitochemically, it can be easy to distinguish CFT from solitary fibrous tumor of pleura and desmoplastic mesothelioma on the basis of immunoreactivity of tumor cells for CD-34 and cytokeratins (9). Immunoreactivity of tumor cells for CD-34 characterizes solitary fibrous tumor of pleura and that for cytokeratins desmoplastic mesothelioma. The tumor cells of this case were negative both for CD-34 and for cytokeratins. Therefore this case can be clearly distinguished from those tumors. Although they all are vaguely similar to CFT, the psammomatous or dystrophic calcification with the lymphoplasmacytic aggregates set it apart from them. In the differential diagnosis, localized amyloid tumor was also considered. Amyloid is more homogeneously waxy than collagen with positive staining of Congo red and frequently induce giant cell reaction (10). No amyloid was demonstrated in this tumor.

The mechanisms of calcification are diverse and pluralistic in different lesions, depending on the nature of the lesion and the tissue involved (11~13). Dystrophic calcification can result from deposition of calcium in matrix vesicles derived from cellular degeneration products (12), or from direct mineralization of collagen fibers (13). Similarily, psammoma bodies have been noted to originate both intracellularly and extracellularly. Lee and

Sen (14) postulated that psammomatous calcification resulted from mineralization, suggesting laminar deposits of hydroxyapatite, of collagen fibers in areas where the fibers assumed a whorled or circular configuration as seen in meningiomas (11). In addition, they assumed inflammatory cellular infiltration is likely to be a reaction of the host to the degeneration of collagen fibers.

The present case is one of CFT previously reported by Fetsch et al.(1), Rosenthal and Abdul-Karim (2), and Pinkard et al.(3). In addition, the old age in this case suggests that CFT have wide age distribution, and the unusual site of occurrence, mediastinum, and also that CFT develops anywhere, including body cavity to external body sites and pleura as seen in the three previous case reports.

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