Benign Clear Cell Tumor of the Lung : A Case Report

Panthep Suttinont, M.D.*
Piyavadee Leksrisakul, M.D.*

Abstract : **A case of benign clear cell tumor of the lung in Thai male patient 22 years of age is presented. It is rare tumor with uncertain histogenesis. The perivascular epithelioid cells are proposed to be the proliferating cell type in the group of clear cell tumor, angiomyolipoma and lymphangioleiomyomatosis. Most of clear cell tumor of the lung is benign and cured by tumor resection.**

เรื่องย่อ : เนื้องอกไม่ร้ายของปอดชนิดเคลียร์เซลล์

ปานเทพ สุทธินนท์ พ.บ.*, ปิยะวดี เล็กศรีสกุล พ.บ.*
*ภาควิชาพยาธิวิทยา, คณะแพทยศาสตร์ศิริราชพยาบาล, มหาวิทยาลัยมหิดล, กรุงเทพมหานคร 10700.

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รายงานผู้ป่วยชายไทย อายุ 22 ปี เป็นเนื้องอกไม่ร้ายของปอดชนิดเคลียร์เซลล์ เซลล์ต้นกำเนิดของเนื้องอกชนิดนี้ยังไม่แน่ชัด แต่พบว่าน่าจะเป็นเซลล์เอปิเธลิออยด์ที่อยู่รอบหลอดเลือด ซึ่งเป็นเซลล์ที่พบร่วมกันในเนื้องอกแองจิโอมัยโอไลโปมา และลิย์มแฟงจิโอลัยโอมัยโอมาโตสิส เนื้องอกชนิดนี้รักษาหายขาดโดยการผ่าตัด

INTRODUCTION

Clear cell tumors of the lung are rare pulmonary tumors first described by Leibow and Castleman in 1963. Patients are typically asymptomatic with solitary lesions on chest radiography. The accurate diagnosis is important because of its resemblance to some malignant tumors. This article reports a Thai patient with this tumor.

CASE HISTORY

A 22-year-old healthy Thai man presented on routine check up in April 2001. His chest radiography revealed solitary lesion in left lung. On admission, there were no abnormal physical or laboratory findings and he underwent tumor resection

Pathological findings

The tumor was spherical, measuring 2 cm in diameter. It was well circumscribed, non-encapsulated, soft and grayish white mass without necrosis or hemorrhage. It had no relationship to bronchus or bronchiole.

Microscopically, the tumor was composed of large clear cells arranged in small nests and surrounded by very delicate capillaries, which often led into thin sinusoidal vessel (Figure 1). Hyaline changes were sometimes encountered in the vessel walls (Figure 2). Extensive branching of the vascular

*Department of Pathology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

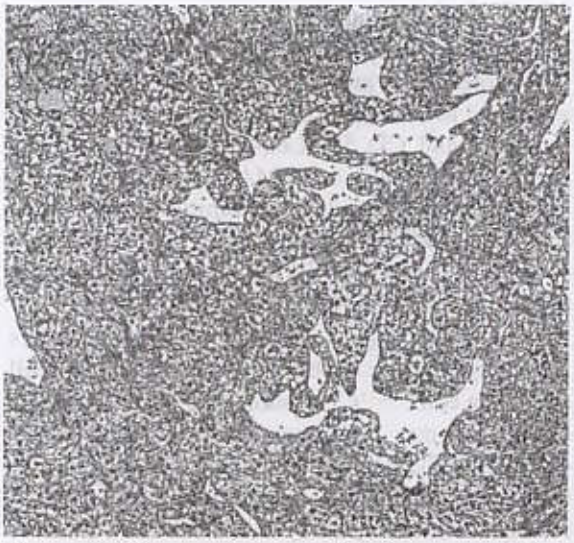

Figure 1. Tumor cells arranged in sheets around thin sinusoidal vessels (H&E x 40)

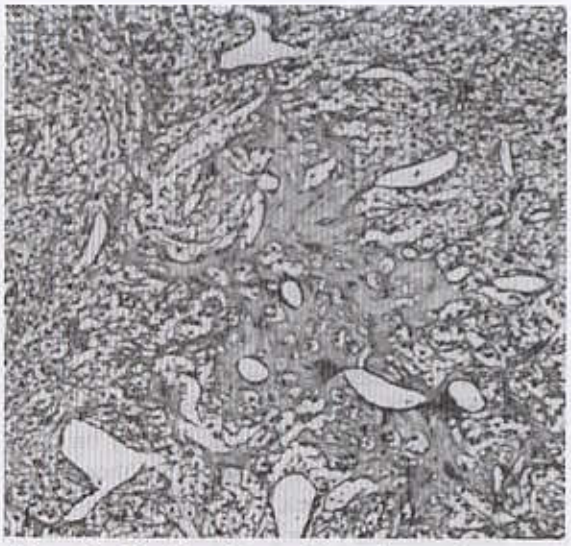

Figure 2. Hyaline change in and near the vessel walls (H&E x 40)

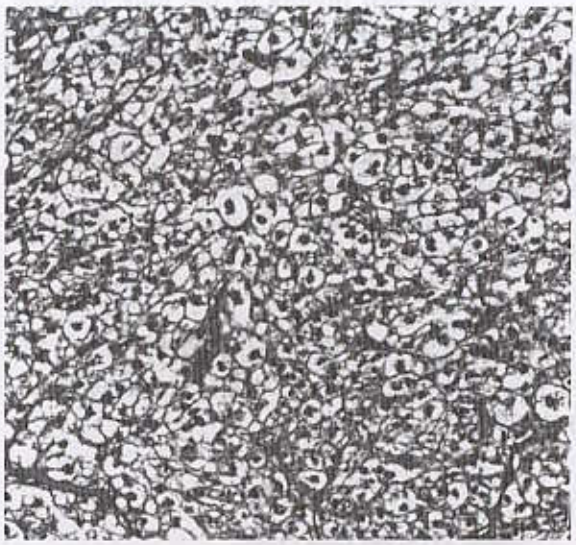

Figure 3. The tumor cells have clear cytoplasm with bland nuclei and prominent cell borders (H&E x 100)

channels was conspicuous. There was scanty connective tissue stroma. The tumor cells were polygonal with clear cytoplasm and prominent cell borders (Figure 3). The nuclei varied in size, and contained prominent nuclear membranes, mitosis was absent. The cytoplasm of tumor cells was strongly positive with the periodic acid-Schiff (PAS) stain and sensitive to diastase pre-digestion because of their high glycogen content.

For immunohistochemical studies, sections from paraffin-embedded material were used. The tumor cells expressed immunoreactivity to vimentin, S-100 protein and HMB-45. They showed negative immunostaining for low and high molecular weight keratin (AE1, AE3), epithelial membrane antigen (EMA) and neuron-specific enolase.

DISCUSSION

Leibow and Castleman first reported four cases of benign clear cell tumor in 1963[1] with more detailed report of 12 cases in 1971.[2] Since then, there have been some sporadic case report.[3-9] Sugar tumor is a term that was coined by Leibow because of the glycogen content of tumor. Biochemical analysis revealed one clear cell tumor to contain 10, 657 µmol of hexose per 100 g of wet tissue while normal lung tissue and other pulmonary tumors contain at most 27.5 µmol of hexose per 100 g of wet tissue.[10]

The reported cases ranged in age from 8 to 70 years (median, 51 years of age). Most patients were asymptomatic and discovered incidentally on chest x ray. Most of them occur in the lung, although one was reported in the trachea.[11] The recent report show three extrapulmonary benign sugar tumors occur at rectum and vulva.[12] Most tumors are small solitary lesion ranging from 0.7 to 6.5 cm in their greatest dimension (median 2 cm) at periphery of lung without lobar predilection. They are well-demarcated red-tan nodules and cut surfaces are uniform without necrosis or hemorrhage, with rare exception. Gaffey and colleagues suggested that tumors greater than 2.5 cm in diameter with necrosis or symptoms should be regarded as potentially metastasizing neoplasms.[9]

The characteristic histologic features consist of large cells with clear cytoplasm arranged in sheet and cords supported by a delicate fibrovascular stroma. The tumor cells are often grouped around large, irregular, thin-walled, sinusoidal-like vessels with focal areas of perivascular stromal hyalinization. The tumor cells are polygonal but may be elongated or spindle shaped, with clear to eosinophilic granular cytoplasm. Mitoses are usually absent.

The immunostains of most tumors are positive for HMB-45 and focally reactive with S-100 protein. A minority has been positive for vimentin, neuron-specific enolase, synaptophysin, HAM-56 and CD 57 (Leu-7). They have been negative for keratin, and EMA. The ultrastructural features show abundant cytoplasmic glycogen which is both free and membrane bounded with distribution compared to that seen in the type II glycogenosis (Pompe disease).[13]

Early suggestions for the origin of tumors included myogenic or pericytic cells, Kulchitsky cell and Clara cell.[3,4,5,7,14] The subsequent demonstration of melanosomes and immunoreactivity with HMB-45 and for S-100 protein suggests melanocytic or neuroectodermal differentiation.[15] The current concept of a family of systemic HMB-45 positive tumor including sugar tumor, angiomyolipoma of kidney or liver, lymphangioleiomyomatosis and clear cell myomelanocytic tumor of the falciform ligament suggests of perivascular epithelioid cell in origin.[16]

Clear cell tumors of the lung must be distinguished from clear cell carcinoma, either primary in the lung or metastatic from other sites such as the kidney, and because clear cell tumors may contain eosinophilic cytoplasm the differential diagnosis also includes carcinoid tumor, granular cell tumor, oncocytoma and acinic cell tumor.

Almost all clear cell tumors are considered benign and cured by simple excision.

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