Hepatoid Adenocarcinoma Of The Lung: A Case Report

S Genova

Citation

S Genova. *Hepatoid Adenocarcinoma Of The Lung: A Case Report*. The Internet Journal of Pathology. 2001 Volume 2 Number 1.

Abstract

A case of a 71-year-old man with dyspnea attacks, weight loss and astheno-adynamia syndrome is presented. A 7.7 x 6.4 cm well-delineated tumor is found intraoperatively in the superior lobe of the left lung towards the posterior mediastinum. The tumor cells resemble hepatocytes histologically and show expression for alpha-fetoprotein. Diagnosis primary hepatoid lung adenocarcinoma is made. Pericellular basal membrane-like material is found on electron microscopy. A clinico-morphological discussion regarding the biological behavior and prognosis of this rare tumor is presented.

INTRODUCTION

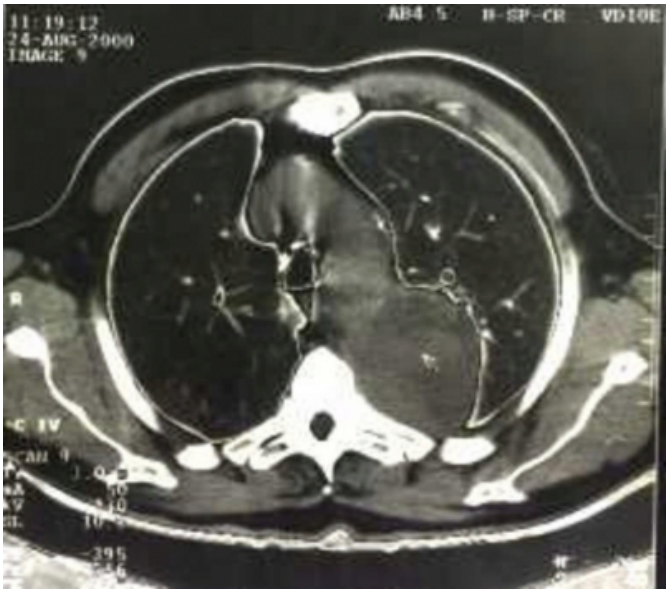
Hepatoid adenocarcinoma is a morphological diagnosis of a tumor that "has histological characteristics of liver tissue and produces alpha-fetoprotein (AFP)" introduced by Ishikura et al. in 1985 ([1]). These tumors affect organs developing from the primitive foregut ([2,3,4,5]). Hepatoid lung adenocarcinomas (HLA) are extremely rare. Only 10 cases of such localization have been described in literature ([6,7,16]). Due to the rarity of the tumor the last is not familiar to the surgical pathologists and any new case contributes to clarification of its complete clinico-morphological description, biological behavior and prognosis. We present a case of primary lung carcinoma with morphological, immunohistochemical and ultrastructural characteristics of hepatoid adenocarcinoma.

CASE REPORT

A 71-year-old man presented with a nine-month history of dyspnea, weight loss and astheno-adynamia syndrome. The CT scan revealed a 7.7 x 6.4 cm tumor formation in the superior lobe of the left lung without communication with the aorta (figure 1). During the operation a well-delineated lobulated tumor mass that did not invade the adjacent lung tissue was found posteriorly in the superior lobe of the left lung bordering the vertebral column. The tumor showed expansive growth and had pseudocapsule. It was firm and gray-whitish in color. The trachea was displaced to the opposite side and forward.

Figure 1

Figure 1: CT scan of a tumor mass of the upper left lung field.



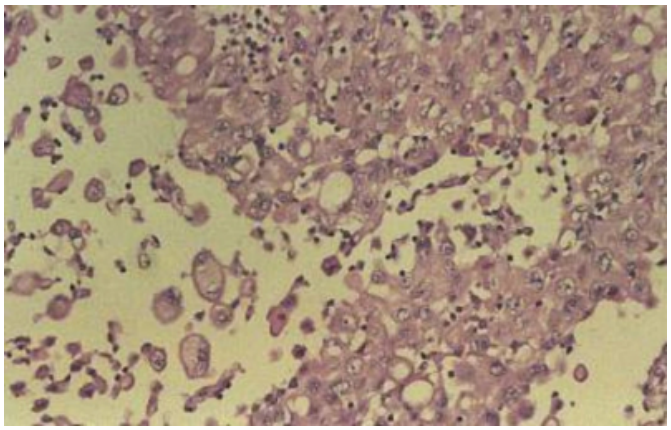
The echography of the liver and abdominal organs helped to exclude tumor of other location. Laboratory findings on admission showed normal prothrombin time – 74%. The last progressively decreased during and after the operation reaching values of 46% and 21%, respectively. Serum AFP was not tested due to irrelevant diagnostic considerations.

On histological examination of samples of the excised material a tumor with solid, trabecular and papillary structure and fine fibrovascular stroma containing lymphoid aggregations was observed. The tumor cells were large, polygonal with abundant eosinophilic cytoplasm and

presence of intracytoplasmic lumens. The cells resembled hepatocytes and had large, nucleolated and centrally located nuclei (figure 2).

Figure 2

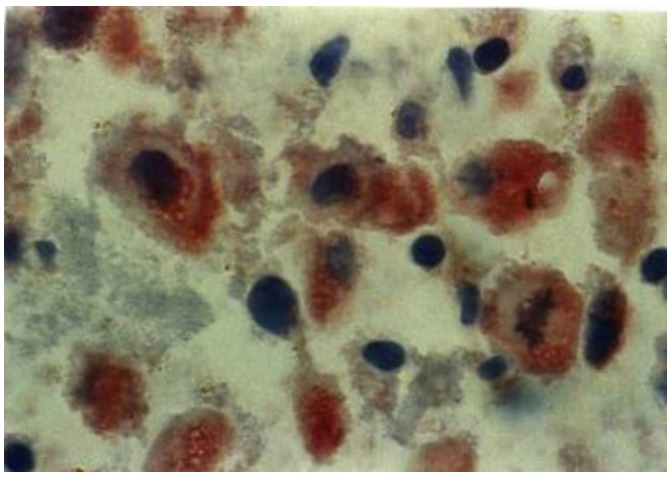
Figure 2: Hepatocyte-like Cells with Intracytoplasmic Lumens and Large Vesicular Nuclei (Hematoxylin-Eosin, Original X 400)



On the cytoplasmic membrane of the cells and around the intracytoplasmic lumens periodic acid-Schiff positive, diastase resistant spiky material was seen. In single cells the material appeared hyaline-like and granulated. Glycogen, hemosiderin and mucin were not observed. Mitotic and apoptotic figures were not detected in the tumor parenchyma. There were no syncytiotrophoblast cells, Shiller-Duval bodies and other teratoma and germinative cell elements. Immunohistochemically, about 90% of the tumor cells showed expression for AFP with granular cytoplasmic and membraneous signal (figure 3).

Figure 3

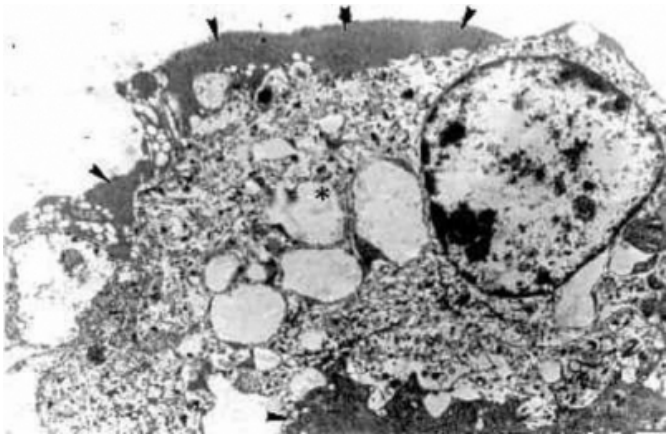
Figure 3: Intracytoplasmic and membranous expression of alpha-fetoprotein (immunostaining for alpha-fetoprotein, original x 1000).



On electron microscope examination, tumor cells presented with microvilli and intracytoplasmic lumens. A material resembling basal membrane by its electron density and structure was seen in the well-developed rough endoplasmic reticulum and outside the cell, along the cell membrane and intracytoplasmic lumens. Single cytoplasmic granules of the same material were in close proximity and fused with the basal membrane material that unsheathed the cells and lumens (figure 4).

Figure 4

Figure 4: Pericellular electron-dense basal membrane-like material (arrowheads); the same material may be seen inside the dilated cisternae of RER (asterisk) (transmission electron microscopy, original x 1500).



Hepatoid lung adenocarcinoma (HLA) was verified by the final pathological diagnosis based on histological, immunohistochemical and ultrastructural criteria.

Presently, two years after resection of the primary HLA, our patient is alive and well with no evidence of recurrence or metastasis, which is quite remarkable compared with the findings of hepatoid adenocarcinomas of other localization (2-5).

DISCUSSION

AFP is an important diagnostic tumor marker for hepatocellular carcinomas, vitelline sac tumors as well as tumors developing from the primitive foregut ([8,9]). Following the first reports of AFP-producing primary carcinomas of the lung presented by Ysunami R et al in 1981 ([10]) HLA was classified as a new distinctive entity (6,7). The origin of the tumor is not fully clarified (1,6,7). It is supposed to develop from embryonic remnants of multipotent primitive foregut cells differentiating directly into hepatocytes or to be of germ cell origin (6,7). HLA is assigned to the large-cell low differentiated lung carcinomas

(7). Due to its rarity this tumor is not familiar to the surgical pathologist and could be misdiagnosed in the routine practice. In addition to the hepatoid morphology of the tumor cells, the differential diagnosis of HLA is based on the immunohistochemical verification of AFP secretion (absent in the other lung carcinomas) and exclusion of lung metastasis from other hepatocellular or hepatoid tumor (1,6,7).

Prognosis in HLA is little known because of the small number of cases that have been described and followed up. The survival in similar hepatoid adenocarcinoma of the stomach is more clarified and varies from several days to 1.5 year after the operation (3,12,13,14,15). These tumors are highly aggressive and at the time of their diagnosing diffuse metastases are also present (2,3,4,5).

In our case the tumor shows slow and expansive growth, low cell turnover, formation of pseudocapsule, absence of metastases and the patient's survival is more than 2 years. Some primary hepatocellular carcinomas of the liver show similar biological behavior. Ultrastructural examination of these tumors reveals material, which is identical to the pericellular membrane-like material that we observed (11).

Whether this morphological phenomenon is related to a more favorable prognosis in HLA needs to be elucidated in further investigations on larger number of patients.

CORRESPONDENCE TO

Z. Peshev, M.D. Department of Pathology Medical University of Plovdiv 15 A Vassil Aprilov blvd 4000 Plovdiv Bulgaria Phone: +359 032 602 514; +359 032 26 87 65 E-mail: Jivko_Peshev@abv.bg

References

1. Ishikura H, Fukasawa Y, Ogasawara K, et al. An AFP-producing gastric carcinoma with features of hepatic differentiation: a case report. Cancer 1985; 56: 840-48.
2. Young RH. New and unusual aspects of ovarian germ cell tumors. Am J Surg Pathol 1993; 17: 1210-24.
3. Paner GP, Thompson KS, Reyes CV. Hepatoid carcinoma of the pancreas. Cancer 2000; 88: 1582-9.
4. Ulbright TM. Germ cell neoplasm of the testis. Am J Surg Pathol 1993; 17: 1075-91.
5. Vardaman C, Saavedra JA. Clear cell carcinomas of the gallbladder and extrahepatic bile ducts. Am J Surg Pathol 1995; 19: 91-9.
6. Arnould L, Drouot F, Fargeot P, et al. Hepatoid adenocarcinoma of the lung: report of a case of an unusual alpha-fetoprotein-producing lung tumor. Am J Surg Pathol 1997; 21: 1113-8.
7. Ishikura H, Kanda M, Ito M, et al. Hepatoid adenocarcinoma: a distinctive histological subtype of alpha-fetoprotein-producing lung carcinoma. Virchows Arch A Pathol Anat Histopathol 1990; 417: 73-80.
8. Bourel D, Beaumont I, Rissel M, et al. Ultrastructural localization of alpha-fetoprotein in isolated and cultured rat hepatocytes. J Ultrastruct Res 1981; 74: 217-22.
9. Arias IM. The liver biology and pathobiology. 3rd edition. New York: Raven Press; 1994. pp 3-13, 1143-7, 1222-5, 1501-17.
10. Ysunami R, Hashimoto Z, Ogura T, et al. Primary lung cancer producing alpha-fetoprotein: a case report. Cancer 1981; 47: 926-9.
11. Hiroaki O, Gotaro Y, Hideo N. Immunohistochemical study of fibronectin, lysozyme, and -fetoprotein (AFP) in human hepatocellular carcinoma. Gastroenterol Jpn 1987; 37(6): 915-28.
12. Arthur de L, Frederick P, Gerard VA. Hepatoid carcinoma of the stomach. Cancer 1993; 71(2): 293-6.
13. Eishi N, Toshihiko U, Takashi T, et al. Hepatoid adenocarcinoma of the stomach. Cancer 1993; 72(6): 1827-35.
14. Morimasa S, Yuzo F, Atsuko S, et al. Alpha-fetoprotein-producing carcinoma: biological properties of a cultured cell line. J Gastroeneterol 1955; 30(5): 589-98.
15. Hiroshi I, Yuchiro F, Kazuhiro O, et al. An AFP-producing gastric carcinoma with features of hepatic differentiation. Cancer 1985; 56(4): 840-8.
16. Carlinfante G. Hepatoid carcinoma of the lung. Histopathology 2000; 37(1): 88-9.

Author Information

Silvia Genova
Department of Pathology, Medical University of Plovdiv