Virchows Archiv A Pathol Anat (1990) 417:85–87

Virchows Archiv A
Pathological Anatomy and Histopathology

Case report

An autopsy case of a cystic variant of thymic carcinoma mimicking a thymic cyst

Yuko Katoh[1], Kazuo Shimamura[1], Kennichi Kakudo[1,2], R. Yoshiyuki Osamura[1,2], and Norikazu Tamaoki[1]

[1] Department of Pathology, Tokai University School of Medicine, Bohseidai, Isehara-shi Kanagawa, 259-11, Japan
[2] Division of Diagnostic Pathology, Tokai University Hospital, Kanagawa, Japan

Received September 25, 1989 / Received after revision November 16, 1989 / Accepted November 17, 1989

Summary. An autopsy case of thymic carcinoma is reported. The surgically excised cystic tumour from a 38-year-old Japanese male mimicked a thymic cyst pathologically. After a clinical course of 6 years, postmortem examination disclosed extensive metastases, including cystic lesions lined by benign-loocking squamous epithelium. This evidence suggested that the present tumour was one of the specific variants of thymic carcinoma and not a thymic cyst with malignant transformation.

Key words: Thymic carcinoma – Thymic cyst – Autopsy – Metastasis – Goblet cell

Introduction

Benign mediastinal cystic lesions including cysts of pericardial, bronchogenic, enteric, thoracic duct, thymic, parathyroid, and non-specific origin are usually found by routine chest X-rays and are easily diagnosed by their location and the type of epithelial lining found (Bieger and McAdams 1966; McCafferty and Bahnson 1982; Thacker et al. 1971). Thymic carcinomas, when they consist mainly of cystic spaces, should be included in the differential diagnosis, even if the cystic lesion is lined by benign-looking squamous epithelium (Snover et al. 1982). In this article, we report detailed histological characteristics of an autopsy case of a cystic variant of thymic carcinoma with extensive metastases which pathologically mimicked a thymic cyst. This is the first autopsy case report of a cystic variant of thymic carcinoma with metastases.

Case report

A 38-year-old Japanese male was referred to Tokai University Hospital in March 1983 because of dyspnoea on exertion and abdominal distention. Subsequent examination including chest X-ray, ultrasonic cardiogram and computed tomographic scan pointed out a large cystic tumour occupying the thymic region (Fig. 1). At thoracotomy, a large cystic tumour involving surrounding structures was resected palliatively. During the post-operative course, three excisions and irradiation (total 83.5 Gy) were performed because of the recurrence of the tumour in the anterior mediastinum. He was noticed to have pulmonary metastases, and pleural and abdominal dissemination which led to his death in March 1988.

Pathological examination

The surgically resected specimen showed that the original cystic tumour – measuring 6 × 7 × 7 cm – was situated in the antero-superior mediastinum with focal invasion of the pericardium and vessels. The tumour was unilocular and filled with clear yellow fluid admixed with a small amount of soft and villous tumour tissue. The cyst wall consisted of fibroadipose tissue with variable thickness measuring up to 1 cm. The lining was necrotic with fibrin and adherent blood clot.

A recurrent cystic tumour in the second resection was connected with the thymus.

Microscopically, the cyst wall consisted mainly of haemorrhagic necrosis on the inner surface and dense fibrosis with marked haemosiderin pigmentation and adipose tissue on the external surface, with some small lymphocyte infiltration. Although the epithelial lining was lost from most of the wall, it was partially lined with stratified epithelium showing squamous differentiation (Fig. 2a). The villous tumour tissue found in the cyst at gross examination consisted of a papillary growth of neoplastic epithelium composed of predominantly small uniform polygonal cells with round-to-oval nuclei and scanty cytoplasm (Fig. 3). The cells at the periphery of the nests tended to be arranged in a palisaded manner. Small glands composed of goblet cells with cytoplasmic mucin positive for periodic acid-Schiff and alcian blue were also found (Fig. 3). Involved thymic tissue associated with the cystic wall indicated a close connection of the tumour to the thymus (Fig. 4).

At autopsy, in addition to multiple nodular metastases in both lungs, liver and lymph nodes, extensive dissemination accompanied by mucus production was found in both pleura and the peritoneum. Multiple metastases at autopsy were mainly solid but sometimes associated with small cystic lesions.

Microscopically, the metastatic tumour also consisted of small polygonal cells, goblet cells and well-differentiated squamous epithelial cells, which lined the cystic metastases (Fig. 2b). No lesion suggesting another primary focus of the carcinoma was observed.

Offprint requests to: K. Shimamura

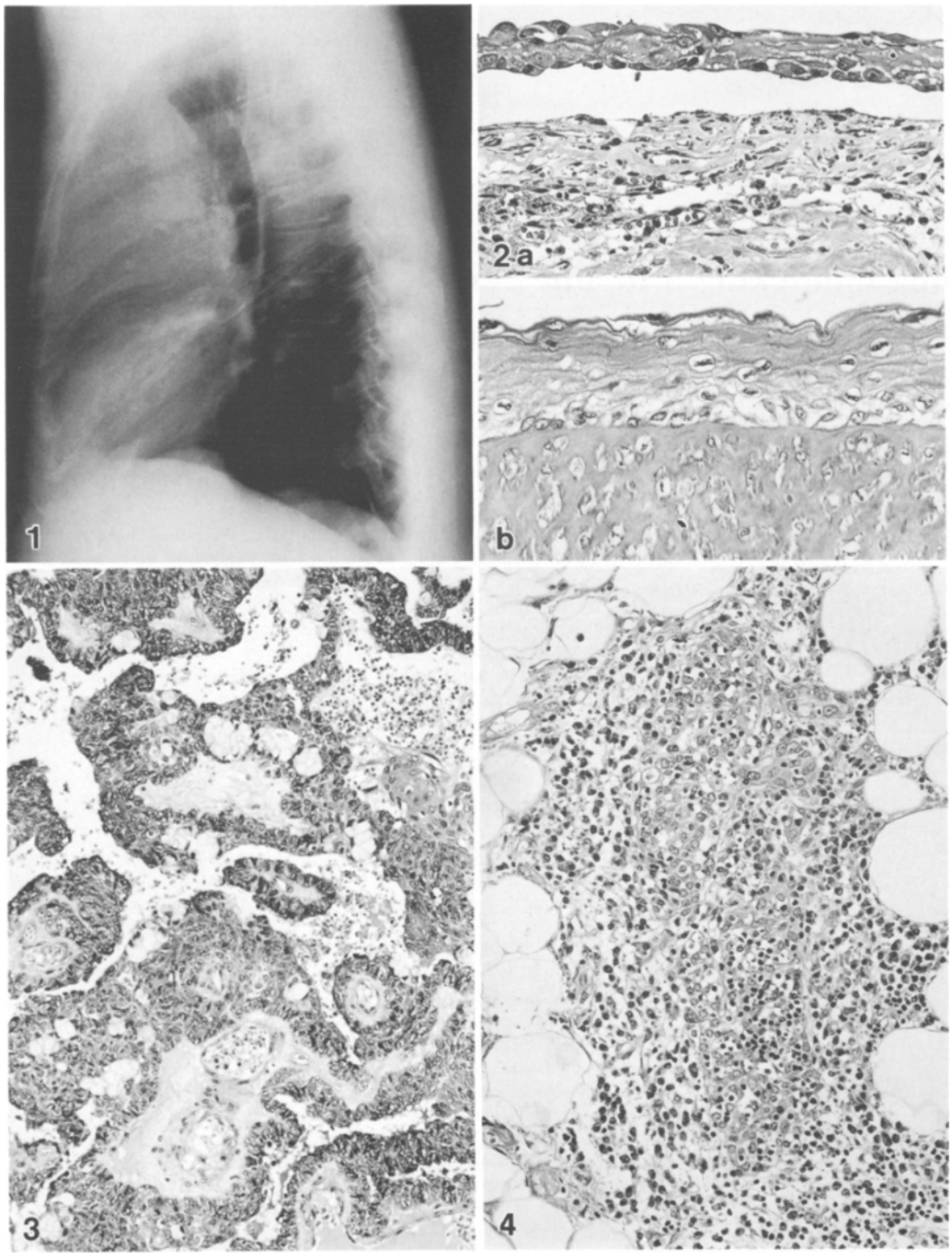

Fig. 1. Chest X-ray. A large cystic lesion occupies the anterior mediastinum and projects into the left lung field

Fig. 2. a The cyst was partially lined with benign-looking squamous epithelium. H&E, ×240. **b** A metastatic lesion in the liver. Well-differentiated squamous epithelium lined a cyst wall of the metastasis. H&E, ×240

Fig. 3. A small villous lesion admixed in the haemorrhagic content of the cyst shows papillary growth of uniform polygonal cells intermingled with goblet cells. H&E, ×150

Fig. 4. Remnants of characteristic thymic epithelium with lymphocytes and plasma cells are present in the cyst wall. H&E, ×150

Absence of mesenchymal cells or tissues in surgical and autopsy materials ruled out the possibility of teratocarcinoma.

Immunohistochemical examination using monoclonal antibodies against α-fetoprotein (Dakopatts, Copenhagen, Denmark) and β-HCG (Immunotech, Marseilles, France) was performed with primary and metastatic tumours. Absence of tumour cells expressing relevant antigens further excluded the possibility of malignant germ cell tumour.

Discussion

From the anatomical localization of the primary cystic tumour, its extensive metastases and the absence of any lesion suggesting another primary site at autopsy, this tumour was classified as carcinoma of the thymus. The following interpretations of the main cystic lesion in our

present tumour are possible: it may represent a thymic cyst with malignant transformation or a cystic variant of thymic carcinoma.

Snover et al. (1982) suggested that malignant transformation of pre-existing thymic cysts may occur from evidence of a benign squamous lining adjacent to or covering the tumour and because of numerous areas of haemorrhage and cholesterol clefts, features reminiscent of a thymic cyst. Leong and Brown (1984) also reported malignant transformation in a thymic cyst. Their identification of the pre-existing thymic cyst was based on the presence of thymic epithelium and lymphocytes in the fibroadipose tissue of the cyst wall.

In the present case, we favour the latter interpretation (a cystic variant of thymic carcinoma) for the following reasons. One is that benign-looking squamous epithelium and goblet cells are true components of the carcinoma as they were noted in the cystic wall of metastases. Further, benign epithelium, suggesting the pre-existence of a thymic cyst is absent in our case. Finally, microscopic thymic tissue can be also present in thymic carcinoma and the presence of thymic tissue does not exclude the possibility of thymic carcinoma.

Primary thymic carcinomas are generally solid tumours, and are distinguished from ordinary malignant thymomas by the presence of cytologically malignant features (Wick et al. 1982). Most of these are squamous cell carcinomas, lymphoepithelioma-like carcinomas, or undifferentiated carcinomas (Levine and Rosai 1978; Shimosato et al. 1977; Thomson and Thackray 1957; Wick et al. 1982). From a review of literature, it appears that goblet cells were rarely mentioned in thymic carcinomas (Hoffmann et al. 1985; Snover et al. 1982). If thymic carcinoma is derived from pluripotential cells in the thymus as suggested by Snover et al., it can be considered that goblet cells represent one of the directions of differentiation. In a recent report, Matsuno et al. also demonstrated the capability of thymic epithelial cells to differentiate mucus-secreting epithelium (Matsuno et al. 1989).

Two of the three cases of cystic carcinoma reported in the literature with follow-up studies, although they were reported as malignant transformation of a thymic cyst, showed no recurrence after more than 2 or 6 years (Leong and Brown 1984; Snover et al. 1982). In spite of repeated recurrences of the tumour, the postoperative clinical course of the present case was 60 months, which was longer than the average postoperative survival of thymic carcinoma patients, 20.6 months, reported by Wick et al. (1982). From the gross and microscopic characteristic findings and favourable prognosis when compared with ordinary thymic carcinoma, cystic thymic carcinoma should be regarded as a pathologically special type, which should be differentiated from thymic cysts.

Acknowledgments. The authors wish to thank Akira Akatsuka and Sadaaki Hori for their excellent technical assistance, and Johbu Itoh for his excellent photographic work.

References

Bieger RC, McAdams AJ (1966) Thymic cysts. Arch Pathol 82:535–541

Hoffmann WJ, Moller P, Manke HG, Otto HF (1985) Thymic carcinoma: 98 cases with special reference to three unusual cases. Pathol Res Pract 179:337–353

Leong ASY, Brown JH (1984) Malignant transformation in a thymic cyst. Am J Surg Pathol 8:471–475

Levine GD, Rosai J (1978) Thymic hyperplasia and neoplasia: a review of current concepts. Hum Pathol 9:495–515

Matsuno Y, Mukai K, Noguchi M, Sato Y, Shimosato Y (1989) Histochemical and immunohistochemical evidence of glandular differentiation in thymic carcinoma. Acta Pathol Jpn 39:433–438

McCafferty MH, Bahnson HT (1982) Thymic cyst extending into the pericardium: a case report and review of thymic cysts. Ann Thorac Surg 33:503–506

Shimosato Y, Kameya T, Nagai K, Suemsu K (1977) Squamous cell carcinoma of the thymus: an analysis of eight cases. Am J Surg Pathol 1:109–121

Snover DC, Levine GD, Rosai J (1982) Thymic carcinoma. Five distinctive histological variants. Am J Surg Pathol 6:451–470

Thacker WC, Wells VH, Hall ER Jr (1971) Parathyroid cyst of the mediastinum. Ann Surg 174:969–975

Thomson AD, Thackray AC (1957) The histology of tumours of the thymus. Br J Cancer 11:348–357

Wick MR, Weiland LH, Scheithauer BW, Bernatz PE (1982) Primary thymic carcinomas. Am J Surg Pathol 6:613–630