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Case report

Tumour-to-tumour metastasis

A report of two unusual autopsy cases

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Summary. Two further two cases of the previously undescribed combination of tumour-to-tumour metastasis – gastric carcinoma metastatic to meningioma and pancreatic carcinoma to thymoma, are presented. The clinico-pathological characteristics of these cases are briefly discussed with a review of the literature.

Key words: Neoplasm metastasis – Stomach neoplasms – Meningioma – Pancreatic neoplasms – Thymoma

Introduction

Since the report by Berent (1902), an increasing amount of literature has documented tumour-to-tumour metastasis, including metastases to both benign and malignant neoplasms. Lung and breast cancers are common donor malignancies and as a recipient, meningioma and renal cell carcinoma are the most common benign and malignant neoplasms, respectively (Ottosson and Berge 1968; Chambers et al. 1980; Barz 1983). Here we present further two cases of the previously undescribed combination of tumour-to-tumour metastasis – gastric carcinoma metastatic to meningioma and pancreatic carcinoma to thymoma.

Case Reports

Case 1. A 74-year-old woman was admitted to the hospital because of diplopia and sensory disturbance of the right half of the face. Neurological examinations revealed palsy of the right fifth and sixth cranial nerves with loss of hearing on the

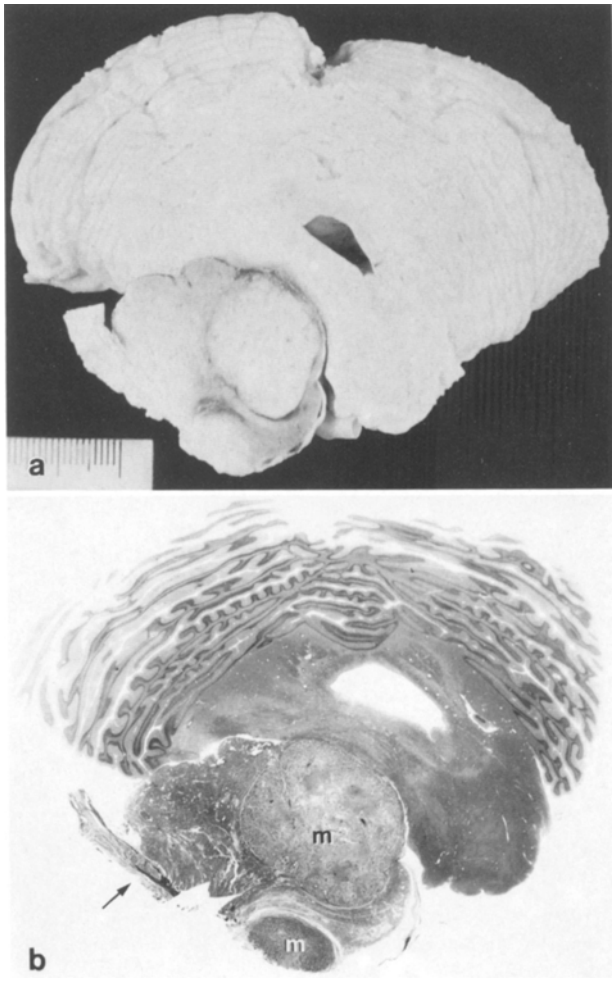

Fig. 1. (Case 1). **a** and **b** Meningioma arising from the tentorium cerebelli (*arrow*), compressing the right half of the pons and middle cerebellar peduncle. Sharply outlined nodular metastatic deposits (*m*) are seen within the tumour. **b** Haematoxylin-Eosin ×0.36 (original magnification)

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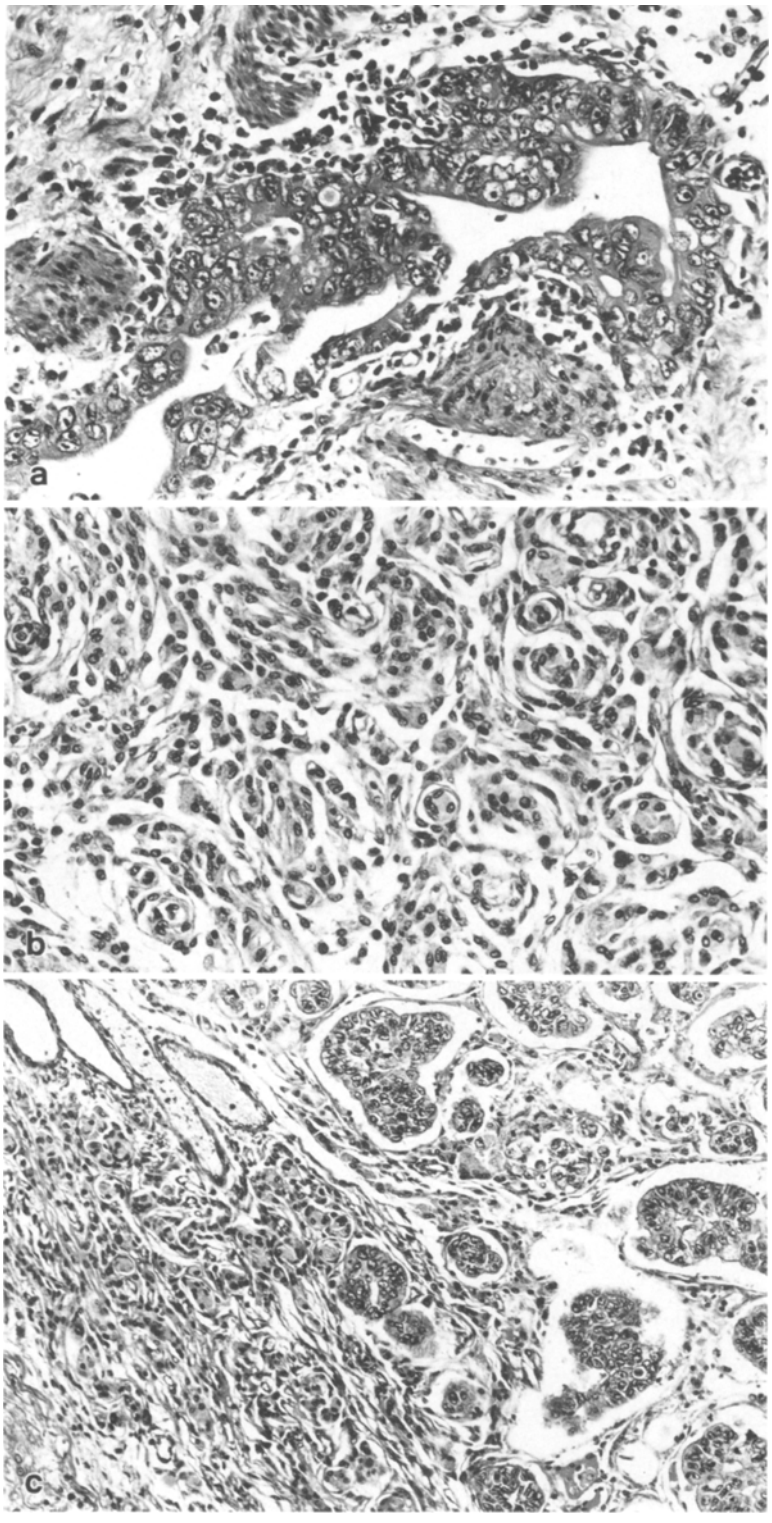

Fig. 2. (Case 1). **a** Papillo-tubular adenocarcinoma infiltrating the muscular layer of the gastric body. H-E ×66.
b Transitional meningioma with whorl formation. H-E ×66.
c Meningioma harbouring a metastatic adenocarcinoma (*right*). H-E ×40

same side. Brain CT suggested a low density area at the right cerebello-pontine angle with a compressed fourth ventricle. Endoscopic examination of the alimentary tract disclosed a large protruding tumour around the gastric cardia and biopsy revealed an adenocarcinoma. Despite of irradiation (5000 rad) and hyperthermic therapy, the patient died three months after admission. During the course, gradual progression of the neurological symptoms was noted.

Autopsy revealed an ulcerated tumour of the stomach located in the posterior wall of the upper gastric body, measuring 3.3 × 1.8 cm in greater diameter and involving the lower portion of the oesophagus contiguously. Histological examination re-

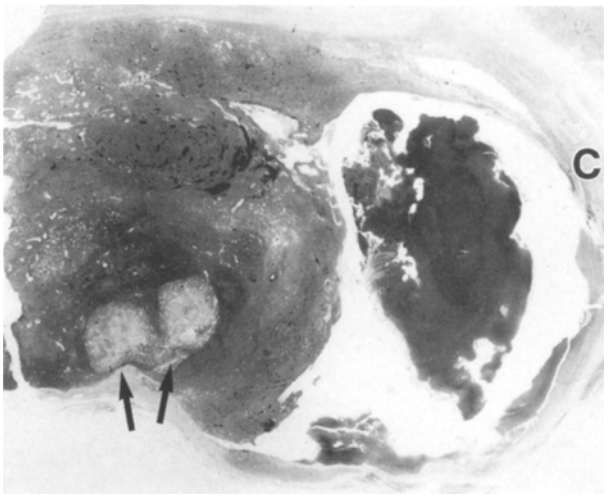

Fig. 3 (Case 2). Sections of an incidentally found anterior mediastinal thymoma, showing fibrous capsule (*C*), cystic change and nodular deposits of metastatic carcinoma (*arrows*). H-E ×1.0 (original magnification)

vealed a well differentiated papillo-tubular adenocarcinoma (Fig. 2a) with marked regressive changes, considered to be radiation effects. The metastatic spread of carcinoma involved the liver and the lymph nodes in the supraclavicular and perigastric regions.

A dumbbell-shaped, grayish firm tumour, measuring 5.5 × 4.5 × 3.0 cm in greatest dimension, was seen located in the right middle and posterior cranial fossae and was attached to the right portion of the tentorium cerebelli. The bulk of the tumour was bulging from both surfaces of the dura and compressing the adjacent structures, including the pons, cranial nerve roots and the infero-medial portions of the right temporal lobe. The cut surface disclosed sharply demarcated, grayish-white nodules embedded within the fibrous texture of the tumour (Fig. 1a). Histological examination revealed a transitional meningioma with whorl formation (Fig. 2b). The nodular deposits within the meningioma proveds to be masses of a metastatic adenocarcinoma with extensive central necrosis (Figs. 1b and 2c). The brain and the remaining portion of the dura mater showed no evidence of metastatic carcinoma.

Case 2. A 68-year-old man was admitted to the hospital with a complaint of general malaise. Chest X-ray suggested metastatic lung disease. Biopsy of the left cervical lymph nodes revealed a metastatic mucinous adenocarcinoma. With an unknown primary site anticancer chemotherapy was given. The patient deteriorated gradually and died three months after admission.

Autopsy revealed a walnut-sized firm tumour in the pancreatic tail. Histological examination demonstrated a duct cell adenocarcinoma (Fig. 4). Multiple metastases were confirmed in the lungs, liver, vertebrae and in the systemic lymph nodes. In the anterior mediastinum, an encapsulated firm tumour, measuring 3.0 × 2.5 cm on cut surface, was found among the swollen lymph nodes with metastatic deposits. Histology of the tumour disclosed features of epithelial thymoma with spindle cell component (Figs. 3 and 5). Incidentally, two discrete small nodules of an adenocarcinoma were found within the thymoma (Fig. 3), which was considered to be a metastasis from the pancreatic carcinoma (Fig. 5a and c).

Discussion

Meningioma is one of the most common recipient neoplasms in cases of tumour-to-tumour metastasis (Best 1963; Gyori 1976; Hope and Symon 1978; Chambers et al. 1980; Barz 1983; Pamphlett 1984; Doron and Gruszkiewicz 1987). The frequent association of meningioma with breast cancer as a tumour-to-tumour metastasis, may be explained by the fact that meningiomas are found more frequently in females and that breast cancers are prone to metastasize to the dura mater (Barz 1983). Bellur found a statistically significant degree of association between meningioma and extraneural primary malignancy (1979), and this may also explain the frequent occurrence of metastasis-har-

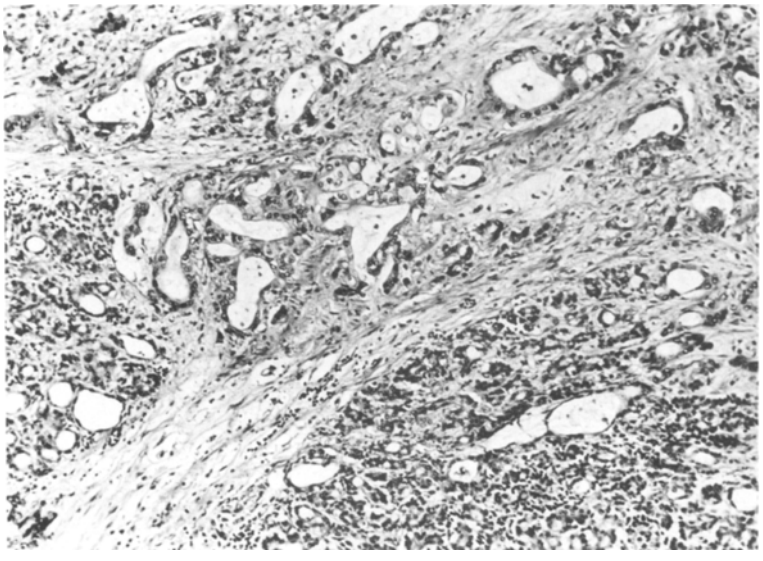

Fig. 4. (Case 2) Sections of the pancreatic tail, showing a duct cell adenocarcinoma (*upper half*) infiltrating the pancreatic parenchyma. H-E ×25

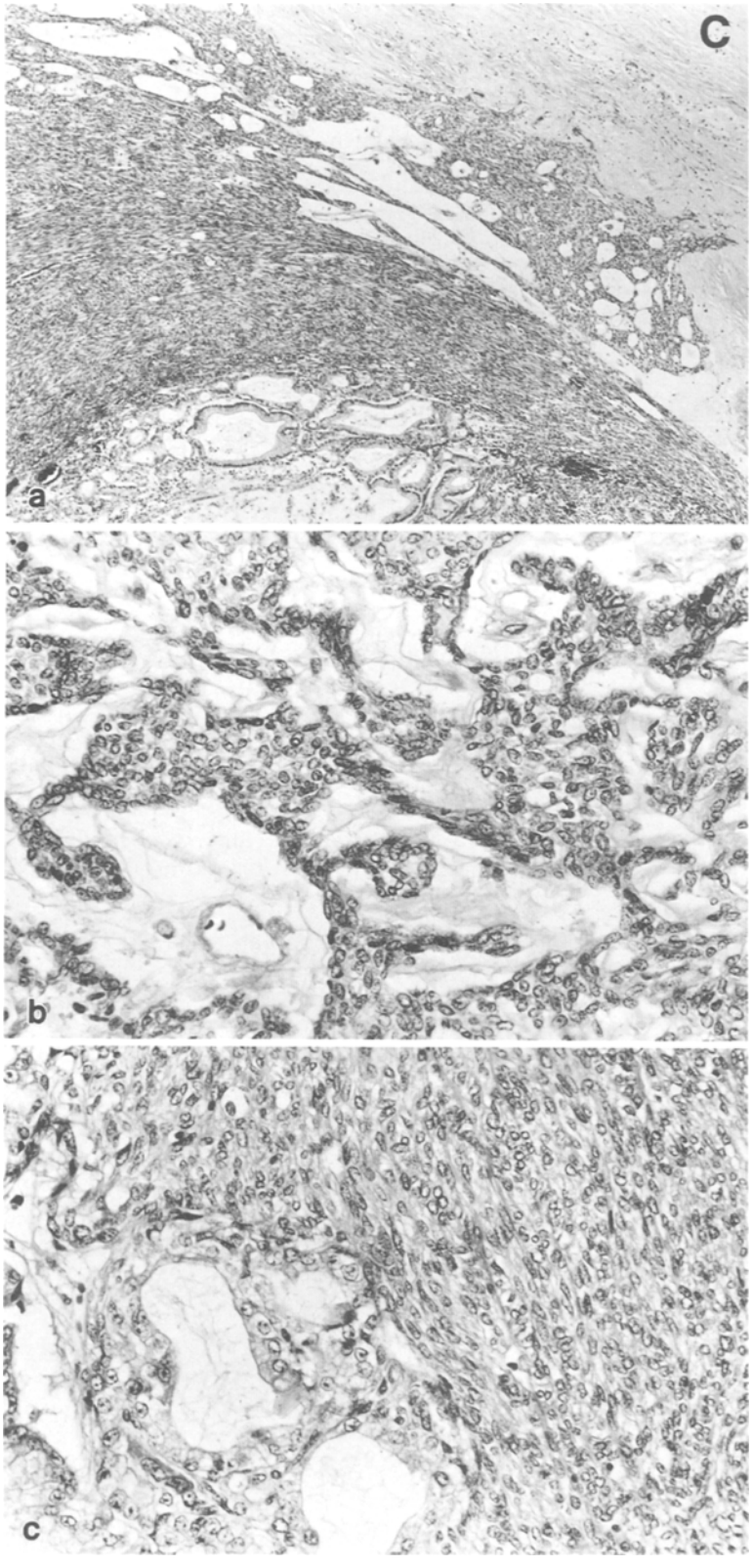

Fig. 5a–c. (Case 2). Higher magnification of Fig. 3. **a** Encapsulated thymoma harbouring a metastatic adenocarcinoma (*below*). C: capsule H-E ×16. **b** Epithelial thymoma showing anastomosing cords of tumour cells and perivascular space. H-E ×80. **c** Interface between epithelial thymoma with a spindle cell component and metastatic adenocarcinoma. H-E ×80

bouring meningiomas. To our knowledge, meningioma bearing metastases from a primary gastric carcinoma as in our case, however, has never been reported in the literature. Interestingly, not a few reported cases including ours showed no intracranial metastases other than within the meningiomas (Chambers et al. 1980). Meningiomas may possibly be even considered a tissue liable to harbour metastasis similar to liver or lung (Barz 1983). However, metastatic deposits in meningiomas may also develop clearly demarcated nodules as is often the case with liver or lung metastases (Best 1963; Chambers et al. 1980; Pamphlett 1984; Doron and Gruszkiewicz 1987). From this point of view, some reports have discussed the possibility of a preoperative or antemortem diagnosis of metastasis-harbouring meningioma with CT and biopsy (Pamphlett 1984; Doron and Gruszkiewicz 1987). In our case, gradual progression of neurological symptoms may be due to a mass effect of the rapidly growing nodules of metastatic adenocarcinoma within the meningioma.

Reports on cancer-to-cancer metastasis have repeatedly mentioned a renal cell carcinoma as the most common recipient neoplasm (Campbell et al. 1968; Majmudar 1976; Sella and Ro 1987). Ottosson and Berge (1968) confirmed statistically, a remarkably high incidence of renal cell carcinoma to harbour metastases from another malignancy. Participation of thymoma, a potentially malignant neoplasm, in tumour-to-tumour metastasis, has not yet been described. In our case, gross inspection failed to recognize a thymoma because of the advanced mediastinal lymph node metastases from pancreatic carcinoma, and the establishment of the diagnosis of tumour-to-tumour metastasis had to await histological examination. Histology of the thymoma showed a pure epithelial variety with a spindle cell component. Since the patient had received anti-cancer drug therapy, a lymphocytic element might have possibly been depleted (Honma and Shimada 1986). No paraneoplastic syndrome related to thymoma was noted in our case.

As for the mechanism of tumour-to-tumour metastasis, several hypothetical viewpoints have been discussed (Ottosson and Berge 1968; Sharma and Old 1969; Richardson and Katayama 1971; Chambers et al. 1980; Doron and Gruszkiewicz 1987). Analysis of this remarkably rare and peculiar phenomenon when compared with the frequent occurrence of multiple primary neoplasms in an individual, might further our understanding of metastasis in general. Tumour-to-tumour metastasis may become more frequent following the improved prognosis and survival of patients with malignancies (Pamphlett 1984).

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