Case Report

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Thymoma metastatic to liver and pancreas: case report and review of the literature

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Abstract

A 71-year-old man presented with a thymic mass involving the superior vena cava. A mediastinoscopical biopsy initially suggested a diagnosis of type A thymoma. After neoadjuvant chemotherapy, the patient underwent en-bloc thymectomy and vascular resection for a pathology-confirmed type B3 thymoma involving the superior vena cava, the left brachiocephalic vein and the distal part of the right brachiocephalic vein. Adjuvant radiotherapy was administered. Two years after the primary surgery, abdominal computed tomography (CT) and whole body fluorodeoxyglucose (18-FDG) positron emission tomography (PET) scans showed a single hepatic lesion that was treated with wedge liver resection. Pathological examination confirmed metastatic type B3 thymoma. Almost 4 years later, abdominal CT and 18-FDG PET revealed a 2.9-cm solid mass involving the body of the pancreas. Distal pancreatectomy with lymph node dissection was performed. Pathological examination showed a pancreatic metastasis from a type B3 thymoma, without lymph node involvement. The patient is alive and free of disease 6 months after the pancreatectomy (68 months after the initial thymectomy surgery). Intra-abdominal recurrence and pancreatic metastases are very uncommon manifestations of thymoma, but this event should be kept in mind when an abdominal mass is seen during follow-up.

Keywords

Pancreas, pancreatectomy, secondary tumours, survival, thymoma

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Introduction

Thymic neoplasms are extremely rare, representing less than 1% of all human malignant tumours and there are different subtypes of thymic neoplasms described in the literature.[1] Thymic carcinoma is a primary malignant epithelial tumour of the thymus according to World Health

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Organization,[2,3] and it is the most common histotype in adults.[1] Thymoma is commonly considered a relatively indolent tumour and it is only in the advanced stages that it spreads locally in the chest cavity. Extrathoracic metastatic localizations are uncommon[4] and usually associated with thymic carcinoma or thymic neuroendocrine tumours.[5,6]

The present case report describes a patient with thymoma who developed liver and pancreatic metastases after thymectomy.

Case report

A 71-year-old man was admitted in June 2010 to the Department of Thoracic Surgery, University of Padua, Padua, Italy complaining of chest pain, shortness of breath and recurrent episodes of arm and facial swelling. Computed tomography (CT) of the thorax showed a mediastinal solid mass involving the superior vena cava. Fluorodeoxyglucose (18-FDG) positron emission tomography (PET) revealed a mass showing the pathological uptake of 18-FDG with a standardized uptake value (SUV) of 12.49. A mediastinoscopical biopsy confirmed the diagnosis of type A thymoma. Because of the extension of the neoplasm, the patient underwent neoadjuvant chemotherapy with a cisplatin, epirubicin and etoposide regimen, which resulted in stable disease. In December 2010, the patient underwent thoracotomy: the mass involved the superior vena cava (SVC), the left brachiocephalic vein and the distal part of the right brachiocephalic vein (RBV). En-bloc total thymectomy with segmental excision of the superior lobe of the right lung was performed, together with a Gore-tex prosthesis bypass between the RBV and SVC. Histopathology showed type B3 thymoma, Masaoka stage III.[7] Adjuvant radiotherapy (54 Gy) was administered.

In January 2012, a routine 18-FDG PET/CT showed a pathological uptake of the radiotracer in the fourth liver segment with no other site of disease (SUV 8.83). Four months later the lesion became bigger, with a higher SUV (14.4). In July 2012, a wedge resection of the hepatic lesion was performed. Pathological examination showed liver metastasis of type B3 thymoma.

In November 2015, during regular follow-up, an abdominal CT showed a 2.9 cm solid mass involving the body of the pancreas (Figure 1). Pathological examination of the ultrasonographic guided-percutaneous aspiration biopsy of the mass

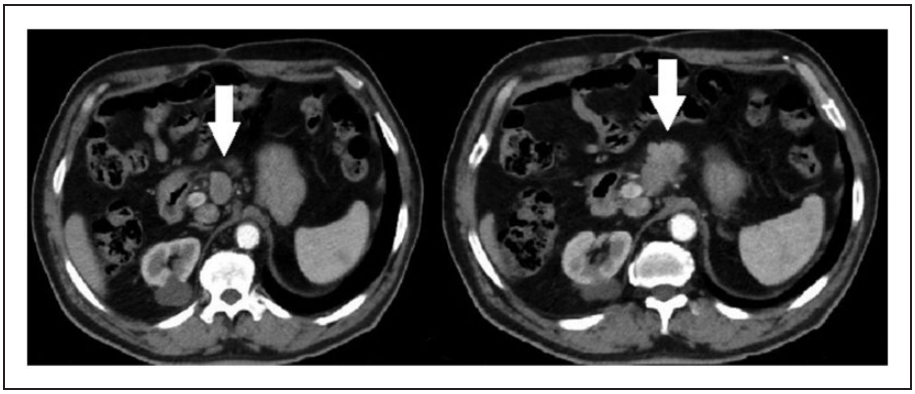

Figure 1. Abdominal computed tomography images of a 71-year-old man showing a solid mass involving the body of the pancreas (arrow).

showed a epithelial neoplasm compatible with a thymic origin. The patient was referred to the Department of Surgery, Oncology and Gastroenterology, University of Padua, Padua, Italy. 18-FDG PET/CT showed pathological accumulation of the radiotracer in the peripancreatic mass, with an SUV of 14.72 (Figure 2). In February 2016, the patient underwent laparotomy. A solid mass involving the body of the pancreas was confirmed and a spleen-preserving distal pancreatectomy was performed. Final histopathology revealed a pancreatic recurrence of type B3 thymoma involving the peripancreatic connective tissue with no lymph node metastases. The thymic neoplastic cells had a spindle/oval shape, lacking nuclear atypia, with very few non-neoplastic lymphocytes. The cells had oval or slightly elongated nuclei, finely dispersed chromatin, and inconspicuous nucleoli. Cells were arranged in ill-defined

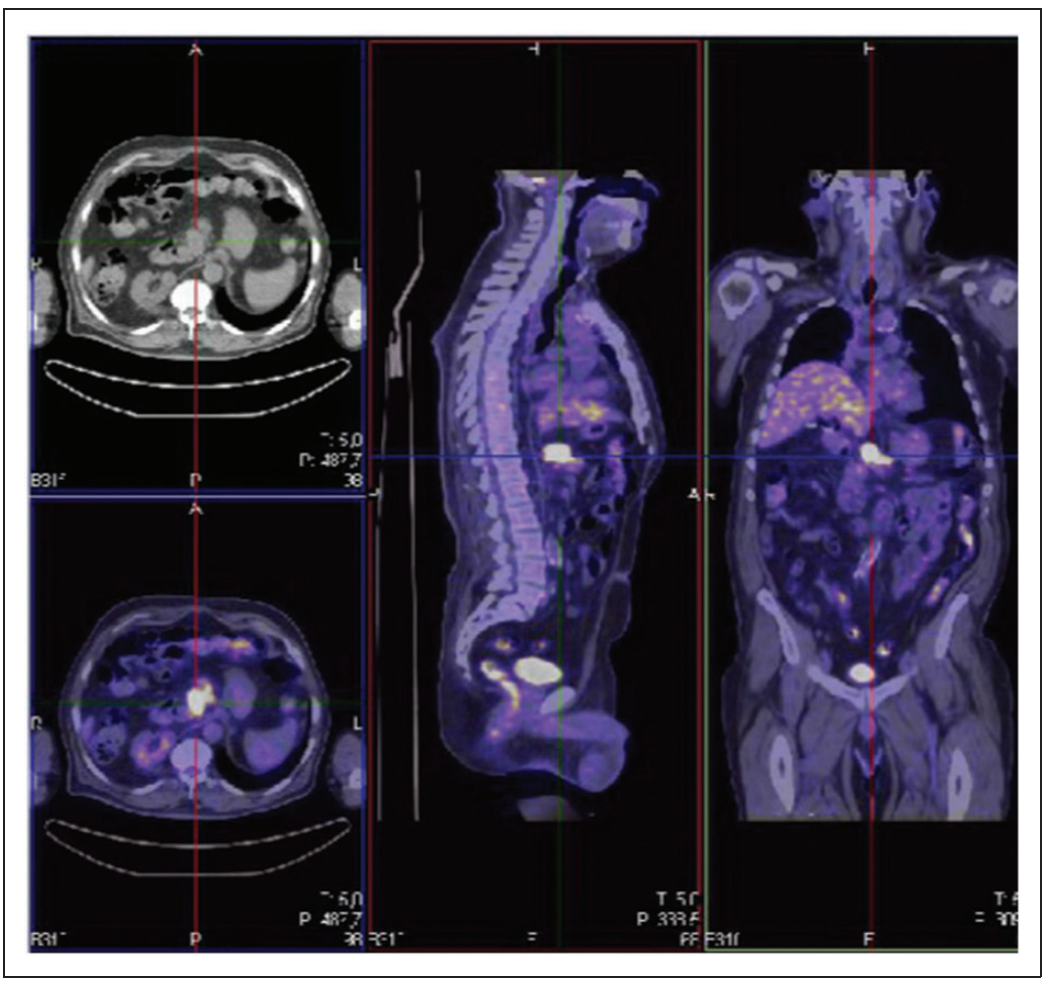

Figure 2. Fluorodeoxyglucose (18-FDG) positron emission tomography/computed tomography of a 71-year-old man showing pathological uptake of the 18-FDG radiotracer in the peripancreatic area with a standardized uptake volume of 14.72. The colour version of this figure is available at: http://imr.sagepub.com.

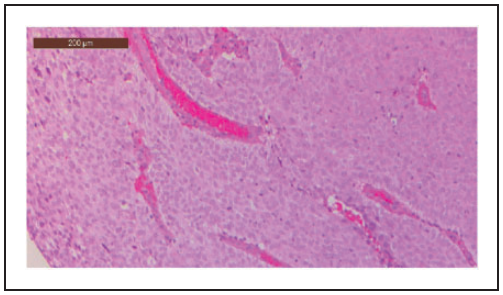

Figure 3. A representative high magnification photomicrograph of the tumour showing the spindle/oval shape of the neoplastic cells having slightly elongated nuclei, with finely dispersed chromatin and inconspicuous nucleoli (haematoxylin and eosin). Scale bar, 200 μm. The colour version of this figure is available at: http://imr.sagepub.com.

bundles and mitotic figures were extremely rare (Figure 3).

The postoperative course of the patient was complicated by type B pancreatic fistula,[8] which was treated with drainage replacement under radiological guidance. Six months after the pancreatectomy (i.e. 68 months after the initial thymectomy) the patient is alive and free of disease. A recent whole body PET/CT scan did not show any pathological uptake of the 18-FDG radiotracer.

Discussion

Metastatic tumours to the pancreas are increasingly being recognized in clinical practice and patients with isolated pancreatic disease are candidates for pancreatic resection.[9] A recent review of the English literature found several malignant tumours metastasizing to the pancreas and many of these were single case reports.[10] In this present paper, the case of very uncommon intra-abdominal metastases from a thymoma in an asymptomatic patient is presented; he had a wedge liver resection and a distal pancreatectomy for metastatic thymoma, 2 and 5 years after primary tumour resection, respectively. Although the follow-up is too short, this case emphasizes the role of surgery for selected, fit patients with limited disease, especially for tumours not responsive to chemotherapy and/or radiotherapy.

Thymic epithelial tumours are classified into thymoma, thymic carcinoma and thymic neuroendocrine tumours.[6] The incidence of thymic tumours is 0.15/100 000 cases per year and they represent 20% of all mediastinal tumours.[6] Thymoma is commonly considered a slow growing tumour with a relatively benign biological behaviour.[6] Thymomas are subclassified into five types (A, AB, B1, B2, B3) according to the WHO histological classification system.[1,3] This classification is related to prognosis: type A and AB show disease-free survival at 10 years in 100% of patients, type B1 and B2 in 83% and type B3 in 36%.[11,12]

In the present case, there was a discrepancy between type A thymoma diagnosed at mediastinoscopical biopsy and type B3 at the final pathological examination of the surgical specimen. Biopsy is not representative of the entire tumour so a definitive diagnosis can only be accurately performed after the evaluation of the resected tumour. Another important prognostic factor is capsular invasion. Noninvasive thymoma recurrence is estimated between 0% and 7%, while invasive thymoma recurrence is between 11% and 36%.[13]

Disease progression in thymomas is mainly characterized by locoregional spread involving the mediastinum and/or the pleural cavity.[4] The majority of distant metastases occur in the lung.[7] Extrathoracic recurrences are extremely rare (3–6%)[4] and strongly associated with the B subtypes.[11,12] Disease progression can be diagnosed years after the resection of the primary neoplasm.[13–16]

Pancreatic metastatic thymomas are only described in case reports and, to the best of our knowledge, only three cases have been

previously reported in the literature.[13–15] A previous report described a case of pancreatic metastatic thymoma associated with myasthenia gravis.[13] Another report described a case of pancreatic metastatic thymoma not associated with myasthenia gravis.[14] In a series of pancreatic metastatic cancers, one case of thymoma metastasis to the body-tail of the pancreas was described.[15] Clinical details of the three published cases and the present patient are described in Table 1. Two patients were asymptomatic, one presented with myasthenia gravis and one presented with jaundice. Two patients underwent radical pancreatectomy, one received a biliary bypass, while one patient with concomitant pancreatic and brain metastases, received only supportive care. Survival details were available for only two patients, both were alive after 6 and 36 months, respectively. One patient died several, unspecified, months after surgery.[14]

Liver metastases are also rare, but among the extrathoracic metastatic localizations, liver is the second most common site.[16] Reviewing the English literature identified fifteen cases of metastatic thymoma to the liver,[7,16–22] but only in six cases was the liver the only site of extrathoracic recurrence; and detailed information was only available for four cases.[17,19–21] Three case reports described metachronous single liver metastases after primary resection of the thymoma;[19–21] and a fourth report described a case of multiple metastatic thymoma to the liver (Table 2).[17] Neoadjuvant chemotherapy was administrated and it resulted in regression of the primary lesion, which was

Table 1. Clinical details of cases of pancreatic thymoma metastases reported in the literature.

First author	Year	*n*	Disease-free interval, months	Pancreas site	Symptoms	Treatment	Outcome (months)
Jack et al.[13]	2015	1	48	Body-tail	Myasthenia gravis	Distal pancreatectomy	Alive (36)
Hoeffel et al.[14]	1997	1	7	Head	Jaundice	Biliary bypass	Dead (NA)
Boo et al.[15]	2011	1	26	Body-tail	None	Supportive	Not reported
Present case	2016	1	61	Body	None	Distal pancreatectomy	Alive (6)

NA, not available.

Table 2. Clinical details of liver thymoma metastases reported in the English literature.

First author	Year	Age, years	Disease-free interval, months	Type of thymoma	Number of lesions	Treatment	Outcome (months)
Marasco et al.[20]	1991	46	48	Not reported	Single	Surgery	Dead (4)
Moretti et al.[21]	2000	58	228	Not reported	Single	Surgery	Alive and disease-free (15)
Hoshino et al.[17]	2008	54	0	B2	Multiple	Radiofrequency ablation	Alive and disease-free (7)
Wang et al.[19]	2014	49	57	AB	Single	Surgery	Not reported
Present case	2016	71	25	B3	Single	Surgery	Alive and disease-free (6)

completely resected, and one persistent hepatic nodule was treated with radiofrequency ablation.[17] The patient was alive and free of disease 7 months after surgery.[17] Another case report described a patient with metastatic thymoma to the lung, lymph nodes, bone and liver treated with surgery, radiotherapy and polychemotherapies who survived 10 years after the initial diagnosis.[22] In contrast to the present case, there have not been any cases reported in the literature describing a double haematogenous metachronous metastatic abdominal localization originating from a type B3 thymoma.

In conclusion, the extrathoracic recurrence of thymoma is very rare and may occur years after resection of the primary tumour. Therefore, lifelong follow-up is strongly recommended for all patients with a history of thymoma and, in cases of isolated abdominal recurrence, surgery appears to be the treatment of choice.

Declaration of conflicting interests

The authors declare that there are no conflicts of interest.

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