Case Report

Primary Carcinoid of Posterior Mediastinum: Truth or Myth!

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ABSTRACT

Mediastinal masses present challenging problems in thoracic practice. Most of them remain asymptomatic for long and by the time the pressure symptoms develop, these are quite advanced. Carcinoids arising from the mediastinum are invariably related to thymus. Non-thymic origin of mediastinal carcinoids is rare, especially in the posterior mediastinum. Only two cases of posterior mediastinal carcinoids have been reported so far. These were assumed to be arising from ectopic thymus tissue. We report a case of a 45-year-old woman who presented with dyspnoea and dry cough due to giant carcinoid tumour of the mediastinum, the pedicle originating from the posterior mediastinum, not related to thymus. She underwent thoracotomy and resection that provided relief. The immunochemical studies revealed positive reaction to cytokeratin, chromogranins and synaptophysin, and negative reaction to S100, CD99 (MIC2) confirming the tumour being neuroendocrine in nature. **[Indian J Chest Dis Allied Sci 2010;52:241-243]**

Key words: Carcinoid, Tumour, Mediastinum, Thymus.

INTRODUCTION

Neuroendocrine tumours (carcinoids) occur in different organs, such as lung, thymus, parathyroid, biliary and gastro-intestinal tracts. Rarely, the neoplasm can arise in non-parenchymal soft tissue including the mesentry, retroperitoneum and the posterior mediastinum. Very few carcinoid tumours have been described arising from the posterior mediastinum. We present a case of a carcinoid of the posterior mediastinum and discuss its management and pathologic implications.

CASE REPORT

A 45-year-old woman presented with dry cough since six months that was not associated with weight loss or a change in voice. Chest radiograph (posterio-anterior view) (Figure 1) revealed a large left para-cardiac shadow, that was confirmed to be a mediastinal mass (18cm x 14cm x 12cm) on computed tomography, revealing cystic changes with areas of necrosis (Figure 2). Bone scan was not remarkable and urinary metanephrines were within normal limits. The patient was subjected to a left posterior-lateral thoracotomy. The tumour was found to occupy most of the left hemithorax extending from posterior to anterior mediastinum. It was resected completely along with pedicle, that was arising from the left paravertebral area between the left pulmonary artery and the arch of aorta.

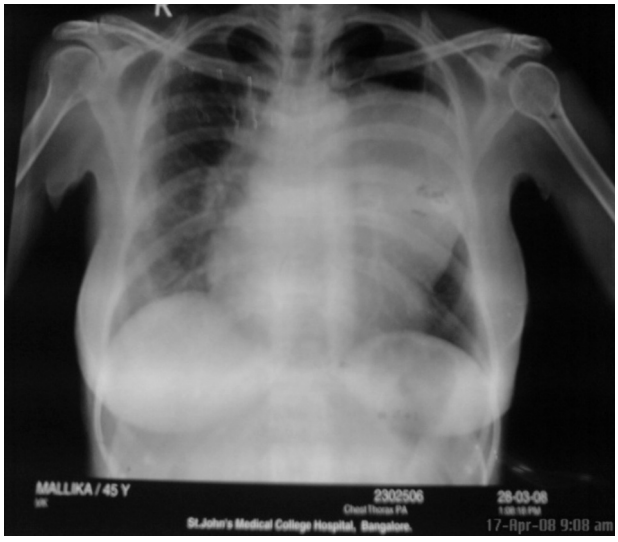

Figure 1. Chest radiograph (PA view) showing left paracardiac mass occupying left hemithorax.

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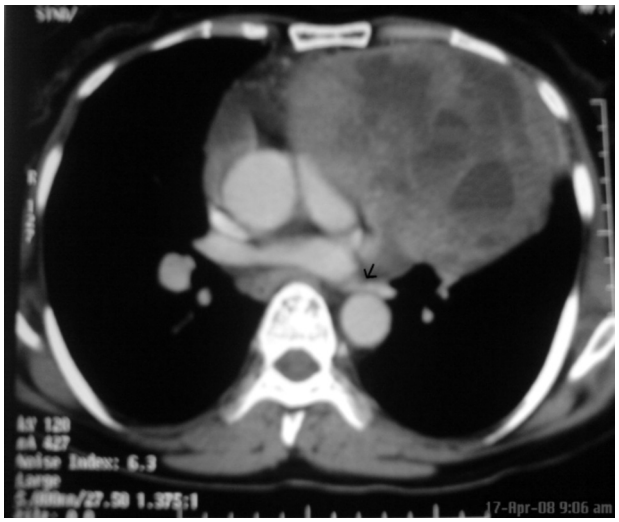

Figure 2. CT chest showing a large non-enhancing cystic lesion in the mediastinum with hypodense and hyperdense areas and origin of pedicle in the posterior mediastinum.

The lesion was globular, well-encapsulated except over the region of the pedicle it was 15cm x 12cm x 10cm in size and weighed 950gm (Figure 3). The cut surface showed solid grey-white and many cystic spaces ranging in size from 1cm to 5cm with areas of necrosis and congestion.

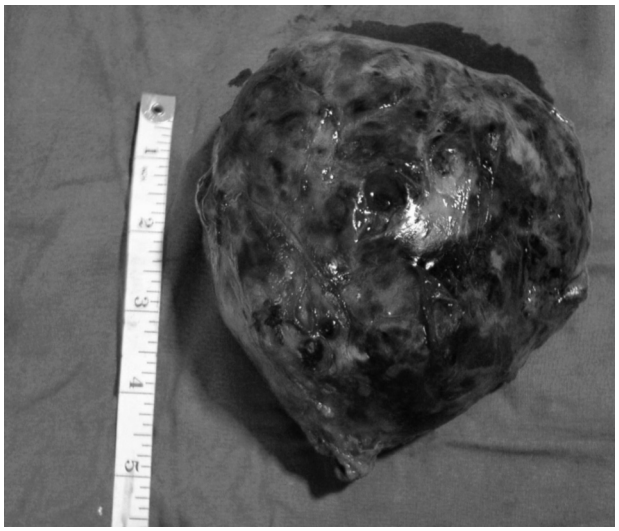

Figure 3. Gross view of the resected specimen showing a well-encapsulated, cystic tumour filled with haemorrhagic material with areas of necrosis.

Microscopic findings showed the tumour was encapsulated and composed of nests, islands, trabeculae and infiltrating cords of cells. The cells had characteristic monotonous appearance with round nucleus stippled chromatin, inconspicuous nucleolus and slightly granular eosinophilic cytoplasm. Calcification and small areas of necrosis were present. Cystic change with areas of haemorrhage was also observed. A few mitotic figures (1 - 2/10 HPF) were seen. Grimellius stain revealed the tumour cells to be argyrophilic. Teratomatous or heterotropic elements or thymic tissue were not seen. A few rosettes were seen, but the typical Flexner-Winter Steiner or Homer Wright rosettes were not observed.

On immunohistochemical analysis the lesion showed positivity for cytokeratin (Figure 4), (AE 1/3) chromogranin and synaptophysin with negativity for S100, CD_{99} (MIC2). Proliterative index (Ki - 67) was very low (2% to 3 %). Based on histology and immunohistochemistry, the lesion was classified as low-grade, well-differentiated neuroendocrine carcinoma.

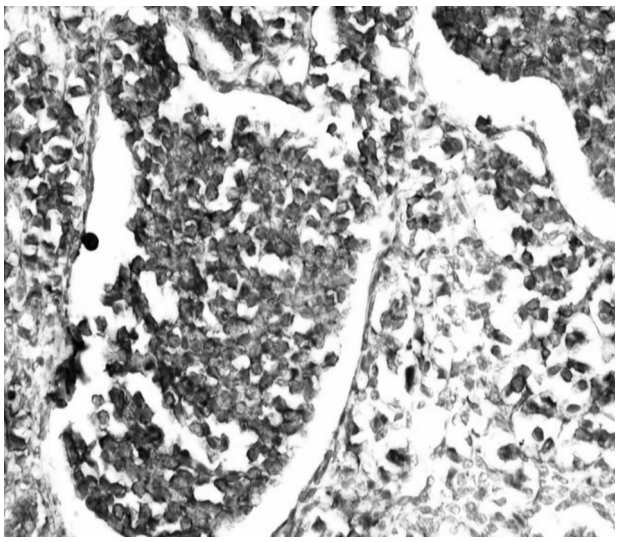

Figure 4. Photomicrograph showing uniform medium sized round cells with fine granular cytoplasm, which on immunohistochemical stain showed positivity for synapto-physin, chromogranin and cytokeratin (magni-fication×400)

The post-operative period was uneventful. Adjuvant chemoradiation was given. The patient is being followed-up and is doing well at the end of six months.

DISCUSSION

The carcinoids are neuroendocrine group of tumours, arising from Kulchitsky cells (APUD cells). They can arise anywhere along the gastrointestinal tract or the bronchial mucosa. Release of serotonin by the tumour may be associated with flushing, diarrhoea, and wheezing as part of the carcinoid syndrome. The term "karzinoide" (carcinoid) was coined in 1907 by Oberndorfer, but is now more relevantly named as the neuroendocrine tumour. The origin of neuro-endocrine tumours of the mediastinum is either from thymus or from ectopic neuroectodermal tissue. Rosai and Higa[1] are credited with the first description of

such tumours in the thymic region. There is marginal relevance of precise distinction between thymic and mediastinal carcinoids.[2] However, few cases of posterior carcinoid reported so far have been attributed to ectopic thymic tissue.[3]

Clinically, patients may be asymptomatic or may present with symptoms of compression of the mediastinal structures. Less frequently, a carcinoid presents with of various endocrine abnormalities or distant metastasis.[3] Our patient with the giant carcinoid has probably been asymptomatic for a long time, until accidentally detected on chest radiography, during evaluation for the cough.

Only one report has proposed it as a primary carcnoid arising from neuroectodermal elements similar to the primary carcinoid arising from the mesentry, IVC and presacral regions.[4-6] In the present case, the tumour was forced to occupy the whole of the mediastinum. The posterior mediastinal origin was confirmed with the finding of the pedicle arising from the left paravertebral area between the left pulmonary artery and the arch of aorta. In the present case, the carcinoid was distinctly separate from thymus and there was no evidence of thymic cells in the specimen on detailed histopathological study as well as on immunohistochemistry. There was no evidence of regional or distant metastases. The present carcinoid tumour arouse primarily from the posterior mediastinum, and we assume that it has originated from neuroectodermal cells. However, further larger series of cases are required to establish this beyond doubt.

The differential diagnosis of the present lesion included paraganglioma, lymphoma neuroblastoma, peripheral neuroectodermal tumour and peripheral neuroepithelioma. The immunohistochemical findings excluded paraganglioma (positivity for cytokeratine, negativity for S100), lymphoma (negative for leukocyte common antigen and positive for cytokeratin), and neuroblastoma (positivity for cytokeratine, chromogranin and synaptophysis and negativity for S100). Peripheral neuroepithelioma is now considered to belong to a group of peripheral primitive neuroectodermal tumours (PNETs). These PNETs may develop in the thoraco-pulmonary para-vertebral portion and may show positivity for cytokeratin, but the present tumour was negative for CD_{99} (MIC2) and PNET was excluded.

The present tumour showed positivity for neuroendocrine cells (synaptophysin and chromogranin) with a low proliferative index (K-67 being 2% to 3%). Based on histology and immunohistochemistry, it was confirmed to be a low-grade, well-differentiated neuroendocrine tumour or carcinoid grade I. It was differentiated from carcinoid grade II (moderately differentiated or intermediate or atypical carcinoid) and carcinoid grade III (poorly differentiated or small cell carcinoma) based on histology and degree of differentiation (monotonous cells with bland morphology and inconspicuous nucleoli and small foci of necrosis) and immunohistochemistry (low proliferative index Ki 67 being 2% to 3 %). Moderately differentiated neuro-endocrine carcinomas (atypical carcinoid) usually show more pronounced cytologic atypia, increased mitotic activity (approximately 4-9/10 HPF), more frequent and extensive areas of necrosis and vascular invasion while poorly differentiated neuroendocrine carcinomas show marked cytologic atypia very high mitotic activity (>10 MF /10HPF), extensive areas of necrosis and frequent foci of vascular invasion.

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