MMJ

Malta Medical Journal, 2024; 36(1)
http://mmsjournals.org/index.php/mmj/39

CASE REPORT

Thymic carcinoma diagnosed in a patient presenting with non-specific chest pain and pulmonary embolism

Etienne Ceci Bonello, Christian Vassallo, Paul John Cassar

A 72-year-old gentleman underwent an elective computed tomography coronary angiography (CT CA) scan along with a CT thorax whilst being investigated for non-specific chest pain. A large lobulated mass in the anterior mediastinum and bilateral pulmonary emboli was found on imaging. He was admitted to hospital and started on subcutaneous enoxaparin 60mg twice daily (1mg/kg/BD). The patient successfully underwent excision of the mediastinal mass 2 weeks later. Histological examination of the mass confirmed a diagnosis of a poorly differentiated non-keratinising squamous cell thymic carcinoma.

Dr Etienne Ceci Bonello
BSc, MD, MRCP(UK)
Department of Respiratory Medicine,
Mater Dei Hospital,
Malta

Dr Christian Vassallo
MD, MSc, MRCP (UK)
Department of Rheumatology,
Mater Dei Hospital,
Malta

Dr Paul John Cassar,
MD, MSc, FRCP(Lond)
Department of Rheumatology,
Mater Dei Hospital,
Malta

A previously healthy 72-year-old gentleman had presented twice to emergency department (ED) within a 3-month period in view of intermittent episodes of central chest discomfort. The pain was not pleuritic and lasted up to 15 minutes each time. He did not complain of any other associated symptoms. In each presentation to the ED, clinical examination and observations were normal, as were cardiac troponins, electrocardiograms and chest x-rays. He was discharged from the ED on both occasions with a diagnosis of non-specific chest pain. On the second presentation he was referred to cardiology outpatients for further investigation.

Upon review at cardiology clinic, he was scheduled for an elective CT CA along with a CT thorax. Imaging showed mild coronary calcifications with mild to moderate (approximately 50%) stenosis of the ostial left anterior descending (LAD) artery, a large lobulated mass in the anterior mediastinum measuring 5.2cm x 4cm with no axillary lymph node enlargement (Figure 1), and large bilateral pulmonary emboli with evidence of right ventricular strain. He was referred directly to the ED for further investigation and management.

Blood investigations including complete blood count, liver and renal profile, electrolytes, glucose, international normalised ratio, activated partial thromboplastin time and thyroid function tests were all within normal limits. Inflammatory markers were not raised. The patient was admitted with continuous cardiac monitoring and was commenced on subcutaneous enoxaparin 90mg once daily (1.5mg/kg/daily).

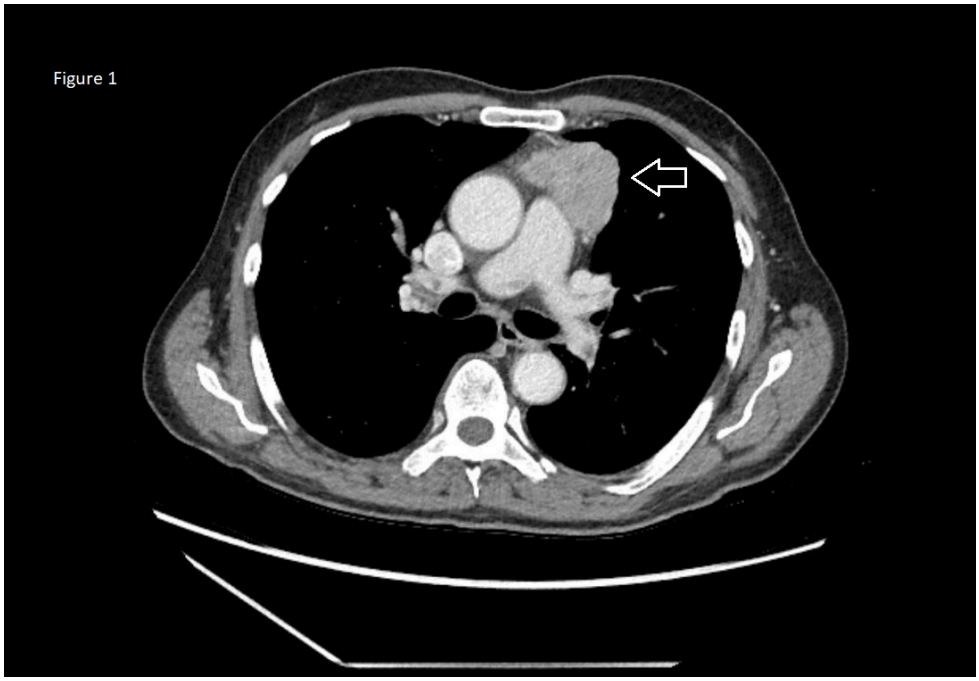

Figure 1 *Lobulated mass in the anterior mediastinum measuring 5.2cm x 4cm*

An in-patient echocardiogram was performed revealing an ejection fraction of 55%, with good systolic and left ventricular function and excluded the presence of right ventricular strain. A contrast-CT scan of the abdomen and pelvis with the purpose to complete cancer staging was performed and there were no findings indicative of any other masses. Further investigations including a blood film, tumour markers, lactate dehydrogenase (LDH), serum protein electrophoresis, immunoglobulin and complement levels, hepatitis and HIV screen were all normal.

A multidisciplinary team (MDT) meeting determined that the mass was most likely a slow growing tumour originating from the thymus gland. Taking into consideration the patients' requirement for anticoagulation, complete excision of the mass at a later date was preferred instead of a CT-guided biopsy. The patient remained admitted for observation for a total of 3 days. Subsequently he was discharged with surgery being carried out 2 weeks later.

The tumour measuring 70mm x 75mm x 30mm was excised *en bloc*, with a wedge excision of the left upper lung lobe and adjacent left pleura. Histological examination showed the thymic parenchyma was extensively infiltrated by angular islands of malignant epithelioid cells. Mitotic activity was high with the tumour being extensively necrotic. The tumour encroached around the vessels with no obvious lympho-vascular invasion. It was also noted to invade the pleura and lung parenchyma. The excision of the tumour was complete, with no metastatic involvement of the mediastinal lymph nodes.

Diagnosis was confirmed to be a poorly differentiated non-keratinizing squamous cell thymic carcinoma, with invasion into pleura and lung parenchyma. It was staged using the Tumour Node Metastases (TNM) staging system (as per our hospital protocols) at pT3 N0 M0, or Stage III as per the Masaoka staging system. The patient recovered well and subsequently referred to oncology for further management.

DISCUSSION

Thymic epithelial tumours are a rare group of thoracic lesions that arise from the thymus gland and include both thymomas and thymic carcinomas. They can be either benign or malignant and commonly present between the ages of 40-60 years, with no particular difference in incidence between men and women. Despite their rarity, they are the most common cause of a primary neoplasm in the anterior mediastinum.[1,2] The overall incidence of thymic tumours in the USA is 0.15 cases per 100,000 person-year.[3]

They can be identified unexpectedly on imaging studies. In fact, 30% of patients are asymptomatic and diagnosed incidentally. However, 60-70% of patients with thymic lesions have symptoms at presentation. Symptoms include chest pain, cough, and shortness of breath, and in cases of invasive neoplasms patients might present with superior vena

cava (SVC) syndrome, hemidiaphragm paralysis (phrenic nerve involvement) or hoarseness (recurrent laryngeal nerve infiltration). Pleural effusion and chest pain are also observed with pleural involvement. Moreover, thymic lesions are frequently associated with paraneoplastic syndromes with myasthenia gravis being the most common.[3]

Work-up of these patients requires pulmonary function tests, especially in cases of concomitant lung invasion which usually requires lobar or total lung resection. Tumour markers are taken to exclude the presence of a germ cell tumour. Advanced imaging techniques such as CT scan are needed to further characterise the lesion and extent of infiltration. Diagnosis requires tissue sampling which is performed with the help of radiological guidance or following complete resection.[4]

Staging of thymic epithelial tumours is based upon the extent of the primary tumour and the presence of invasion into adjacent structures and/or dissemination. Staging systems such as the TNM and Masaoka staging systems are widely used, with the majority of data based on patients staged using the Masaoka system.[5,6]

The mainstay of treatment is complete surgical resection of the tumour mass. In cases where the tumour is not amenable to surgery due to an advanced stage, or the patient is unfit for general anaesthesia, then consideration for chemotherapy and/or radiotherapy should be done. Patients should always be discussed at MDT meetings and referred to a clinical oncologist with specialisation in these mediastinal tumours.

In conclusion, patients with recurrent non-specific chest discomfort should be followed up in order to identify the root cause of their symptoms. Imaging should be considered early in cases of persistent or recurrent non-specific chest pain were all investigations are normal. In patients with thymic tumours, early diagnosis is vital in order to increase the chances of complete surgical resection, hence improving overall prognosis and mortality rate.

LEARNING POINTS

1. Patients with recurrent non-specific chest discomfort should be investigated.
2. Thoracic imaging studies should be considered early in cases of persistent or recurrent non-specific chest pain in which all other investigations are normal.
3. Diagnosis of mediastinal masses requires histological confirmation.
4. Timely diagnosis and surgical treatment increases the chances of complete surgical resection, thus improving prognosis.

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