Intrathoracic-mediastinal myofibroblastic tumor. Report and experience of one case

ABSTRACT

**Background:** Inflammatory pseudotumor is a little known and uncommon condition. The debate continues whether it represents an inflammatory lesion or is a true neoplasm. It is considered a reactive process usually characterized by irregular growth of inflammatory cells. It has been described at various sites, the most common being the lung. The aim of this report is to emphasize the difficulty in the initial diagnosis.

**Clinical case:** We present the case of a 56-year-old male who reports an 8-month history of dry cough, dyspnea, fatigue, weakness and weight loss of 20 kg. We performed two biopsies, one positive for malignancy without response to medical treatment and the second reporting chronic granulomatous inflammation. The patient underwent sternotomy, revealing a tumor of $20 \times 17 \times 10$ cm, weighing ~2 kg. The tumor was dependent on the anterior mediastinum surrounding large vessels, and venous brachiocephalic, pericardium and both pleura with firm adhesions to the right lung. Pathological report was as follows: inflammatory myofibroblastic tumor with positive immunohistochemistry for CD20 and CD3. Postoperative course was satisfactory and 1 year postoperatively there was no evidence of recurrence.

**Conclusion:** Inflammatory pseudotumor is a benign neoplasm of unknown origin with a chronic course. It can simulate a malignant tumor, causing constitutional manifestations, airway obstruction, cardiac alterations or other symptoms according to their location. Diagnosis is based on radiological features and direct biopsy. Treatment of choice is complete resection of the tumor with a favorable long-term outcome.

**Key words:** Inflammatory pseudotumor, inflammatory myofibroblastic tumor, immunohistochemistry, sternotomy, mediastinum.
BACKGROUND

Inflammatory pseudotumor is a known rare condition. It is still being debated whether it represents an inflammatory lesion or is a true neoplasm. It is believed to be a generally reactive process characterized by irregular growth of inflammatory cells.

This pseudotumor has been described in various parts of the body such as the larynx, retroperitoneum, small bowel, stomach, mesentery, pancreas, liver, kidney, bladder, thyroid, lymph nodes, breast, cranial cavity, mediastinum and lung, among others. The lung is the most common location site. It is found in 0.04-1.2% of thoracotomies and represents 0.7% of all chest tumors; however, it is the most common primary lung tumor in children < 16 years of age. The course of this disease is indolent in 50% of cases; however, it may present chest pain, cough, hemoptysis, fever, weight loss, and nonspecific symptoms, according to its location.

We present a case of an inflammatory pseudotumor of the anterior mediastinum initially treated as a malignant neoplasm at another institution. When it did not respond to chemotherapy the patient was sent to our hospital center for treatment.

CLINICAL CASE

We present the case of a 56-year-old female. The patient is a farm worker and a smoker (three cigarettes per day for 20 years). He has a history of two chest traumas with rib fractures (right 11th and 12th ribs) at 35 years of age. The patient’s ailment began 8 months prior to admission to our hospital with dry cough, progressive dyspnea, asthenia, and weight loss of 20 kg. Chest x-ray demonstrated a large mediastinal tumor that extended towards both lung fields. The patient underwent a thoracoscopy with biopsy that reported a poorly differentiated malignant neoplasm consistent with diffuse lymphoma, predominantly large cell. For this reason he was referred to the hematology service where he received unspecified cycles of chemotherapy without response to treatment. Due to this situation, he was sent to our hospital where a biopsy was again taken using an anterior thoracotomy to confirm the previous diagnosis. The histopathological report was that of a marked fibrosis of chronic granulomatous inflammation. Surgical treatment was decided upon.

As part of the pre-surgical workup, chest computed tomography demonstrated that the tumor occupied the entire anterior mediastinum with extension towards the right hemithorax and discretely displacing the heart towards the left, without evidence of invasion to neighboring structures (Figure 1). He had a median sternotomy performed and the findings were that of a 20 × 17 × 10 cm tumor weighing ~2 kg of the anterior mediastinum that surrounded the large vessels, venous brachiocephalic trunk and pericardium. Both pleura also had firm adhesions to the right lung (Figure 2). The entire tumor was resected and the histopathological report was inflammatory myofibroblastic tumor (Figures 3

Figure 1. Tomographic image of the tumor in the anterior mediastinum.
Hernández-Ascencio JA et al. Intrathoracic-mediastinal myofibroblastic tumor

Figure 2. Outer macroscopic appearance of the mediastinal specimen is irregularly pyramidal, yellow, and granular, of adipose aspect with gray and red semi-smooth areas, measuring 3.5 × 2.6 × 2 cm.

Figure 3. Dense fibrous and pancellular stroma that traps and compresses the mature adipose lobules of the tissue. In the stromal thickness there is abundant inflammatory infiltrate that forms lymphoid follicles or granulomas.

Figure 4. Microphotograph of the mediastinum with increased detail of mature adipose tissue surrounded by fibrosis.

DISCUSSION

Although inflammatory pseudotumor may appear in different organs, the preferred location is the lungs. It is a little known disease, which is demonstrated by finding only six major studies with > 10 available patients in the medical literature (1990-2005). This tumor has been referred to using different terms: inflammatory myofibroblastic tumor, plasma cell granuloma, fibroxanthoma, pseudosarcomatous fibromyxoid tumor or inflammatory myofibrohistiocytic proliferation.

It is unclear whether the inflammatory pseudotumor is an uncontrolled inflammatory process or is it a true neoplasm. Its natural history is extremely variable and can range from completely benign lesions with a favorable evolution to large tumors with local invasion. In this case, the patient continues to be followed without evidence of recurrence.
and an unfavorable prognosis. The precise etiology is unknown. The hypothesis of an immunological disorder seems to be the most accepted, for example, the response to a viral infection such as human herpes virus 8 or an antigen-antibody reaction. For other authors the inflammatory pseudotumor represents a true benign, well localized and slow-growing neoplasm or with a low grade of malignancy. This is based on case reports of locally aggressive inflammatory pseudotumor or with infiltration to the pulmonary vessels, heart, chest wall, vertebrae, distant diaphragmatic metastasis or multicentric disease.

There are three histological patterns of presentation although it usually manifests as a mixture of these with one predominating: myxoid vascular, compact spindle cells or fibrous hypocellular, all without clinical, radiological or prognostic difference among them.

Different classifications have been proposed for the inflammatory pseudotumor. Cerfolio et al. proposed two types of inflammatory pseudotumor: non-invasive and invasive. The non-invasive inflammatory pseudotumor is found in asymptomatic patients. It appears as a small lesion without extension to large vessels or surrounding structures, which almost always permits a wide resection without major complications. The invasive inflammatory pseudotumor is more often diagnosed in young patients with fever, fatigue and weight loss. Matsubara et al. subdivided the inflammatory pseudotumor into three subtypes according to the clinical and pathological characteristics: 1) type of organized pneumonia (44%), 2) type of fibrous histiocytoma (44%) and 3) lymphoplasmic type (12%). In 1994, Gal et al. classified the inflammatory pseudotumor as part of a spectrum of fibrohistiocytic pulmonary lesions that range from typical inflammatory lesions without evidence of malignancy to the malignant histiocytofibroma. In 1995, Colby et al. classified the inflammatory pseudotumor into two subtypes: fibrohistiocytic and plasmacellular granuloma. A recent classification from the World Health Organization (WHO) divides the inflammatory pseudotumor into three main histological patterns: myxoid vascular, compact spindle cells and fibrous hypocellular.

Chromosomal alterations have been described in 72% of cells in a female with inflammatory pulmonary pseudotumor as translocations (t[1;2] [q21;p23]) and deletions (del [4] [q27]). In this case presented by Snyder et al. the inflammatory pseudotumor is described as a potentially sarcomatous lesion rather than a simple inflammatory reaction.

It can occur in a wide age range although it is more common in children and young adults (60% of cases are < 40 years of age). There is no predilection for gender, ethnicity, or geographic region. The invasive behavior is more common in childhood. It is asymptomatic in 50-70% of cases and is found as an incidental finding on an imaging test. Patients sometimes report airway-associated symptoms such as dyspnea, chest pain, cough or hemoptysis and, in some cases, fever or weight loss. Up to a third of patients report a history of lower respiratory tract infection, although a direct relationship with the disease has not been demonstrated. Laboratory tests are nonspecific because they can be normal or with changes characteristic of an inflammatory process such as anemia, thrombocytosis, and increased erythrocyte sedimentation rate.

Inflammatory pseudotumor has a tendency to mimic clinically and radiologically malignant diseases. Computed tomography and positron emission tomography (PET) report many false positives for this disease. The uptake of radio-labeled glucose is not specific for malignant tumors and can be seen in a variety of tissues with increased glucose consumption. Also, the
significant increase in the uptake of 18F-FDG has already been reported as an inflammatory pseudotumor characteristic; therefore, the PET will never replace a biopsy for diagnosis of an inflammatory pseudotumor. The final histopathological diagnosis is done using immunohistochemical testing. The treatment of choice for this type of tumor is complete surgical resection as demonstrated by Fabre et al. where complete resection is the reference pattern due to its high cure rate with an aggressive treatment in its initial presentation. The prognosis is excellent with 78-100% of complete remission at 3.3 years and even up to 89% at 10 years. Intrathoracic recurrence has been described in up to 5%, almost always related with affected margins. Risk factors for a poor outcome are the need for reintervention (mortality of up to 96% at 5 years) and size > 3 cm. Steroid treatment is controversial. Cases have been described in which there is no response to treatment and in which there was no complete regression of the disease. It is proposed as a treatment option when surgical resection cannot be carried out. Radiation therapy and chemotherapy have inconclusive results and may be useful in multifocal lesions, local invasion or recurrence.

In conclusion, inflammatory pseudotumor is a benign neoplasm of unknown origin and with a chronic course. It can simulate a malignant tumor and may present with constitutional manifestations, cardiac alterations, airway obstruction, or according to its location. Diagnosis is based on radiological characteristics and direct biopsy. The treatment of choice is complete resection of the tumor with a favorable long-term outcome.

REFERENCES


