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# Dyspnoea, thoracic pain and fever in a young caucasian female: A case report

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ABSTRACT

*INTRODUCTION:* The diagnostic approach to patients with mediastinal pathology is not always simple and an improper diagnostic work-up can lead to significant diagnosis delay.
*PRESENTATION OF CASE:* : We report on the case of a young woman who was admitted to the Emergency Department complaining of thoracic pain, dyspnoea, fever and productive cough. The physical examination showed a painful swelling over the sternum's upper left margin, which had become evident 4 months earlier. A Computer Tomography showed the presence of a retrosternal oval lesion (5.5 x 4 cm) infiltrating the thoracic wall and showed the presence of discretely enlarged mediastinal lymph nodes in several mediastinal stations.
*DISCUSSION:* The Multidisciplinary Team decided to perform an ultrasound-guided biopsy of the retrosternal mass that showed an inflammatory pattern, whereas microbiology tests proved negative. The lack of improvement with medical therapy (non steroideal anti-inflammatories and antibiotics) and the clinical suspicion of malignancy led us to perform a surgical biopsy of the mass that finally proved to be diagnostic for Hodgkin's lymphoma.
*CONCLUSIONS:* Mediastinal masses with an aggressive behavior, should always be considered to be potentially malignant. Surgical biopsy, sometimes, can be the only way to correctly diagnose the pathological process, especially in the case of Hodgkin's lymphoma in which few diagnostic cells (Reed-Sternberg cells) are generally embedded in an abundant inflammatory background tissue.


## 1. Introduction

The mediastinum consists of anatomical structures that can give rise to both benign and malignant tumors, or can be the seat of metastases of malignancies that arise elsewhere in the body. The diagnostic approach to patients with mediastinal pathology is not always simple and an improper diagnostic work-up can lead to significant diagnosis delay. This work is reported in accordance with the SCARE criteria [1].

## 2. Case presentation

A 34 year-old woman was admitted to the Emergency Department (ED) complaining of thoracic pain lasting from 6 days, dyspnoea, fever, and productive cough. She had a history of smoke and a major thoracic trauma due to a car accident that occurred one year before. A chest X-ray performed on that occasion had ruled out a chest wall injury. At admission to the ED her physical examination showed a painful swelling over the sternum's upper left margin, which had become evident 4 months earlier. A chest X-ray revealed a homogeneous opacity behind the sternum. Blood tests were irrelevant, except for a mildly elevated C-reactive protein (CRP 3.62 mg/dl).

To better characterize the lesion, a chest Computer Tomography (CT) scan was performed. This evaluation showed a retrosternal oval lesion (5.5 x 4 cm) with an intra- and extra-thoracic growth and a multifocal lymphadenopathy ranging between 7 mm and 4 cm in the prevascular area, aortopulmonary window, and right paratracheal station (Fig. 1).

*Abbreviations:* CT, Computer tomography; ED, Emergency department; PET, Positron emission thomography; HL, Hodgkin's lymphoma.

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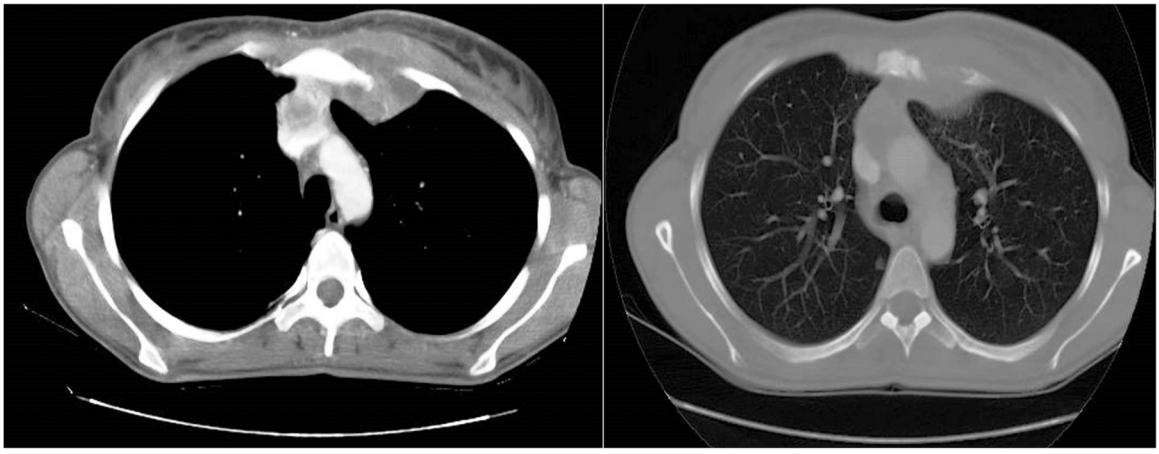

**Fig. 1.** Preoperative CT scans showing the mediastinal mass and the involvement of the sternum.

The new findings, together with the young age of the patient, sped up our investigations, and we performed an ultrasound guide biopsy of the retrosternal mass. At histology, the specimen consisted of "fibroconnectival tissue with necrotic areas, lymphocytic, eosinophilic, and granulocytic infiltrate". No significant results emerged from cultures. All the additional imaging procedures, including abdominal ultrasound and skeletal scintigraphy, proved inconclusive.

As anti-inflammation therapy was ineffective on dyspnoea and chest pain, a new CT scan was performed 30 days later. The size and characteristics of the retrosternal lesion had not changed, but the scan revealed a new paracardiac lesion showing similar features, a multifocal bone involvement with osteolytic and osteosclerotic areas and multiple, bilateral, pulmonary nodules, suspicious for malignancy. A bilateral, axillary lymphadenopathy was also described.

The retrosternal lesion maintained the same size and features, but there was a deeper bone structural alteration. In the meantime the patient complained of the persistence of pain and dyspnoea, so that a Positron Emission Tomography (PET)/CT scan was performed. It showed a high metabolic activity lesion in the mediastinum, involving the sternum. These data suggested a malignant aetiology for the mediastinal mass, and therefore a surgical biopsy was performed.

Pathological analysis of the surgical specimen showed a lymphoid lesion surrounded by dense fibrotic tissue. Within the lesion a mixed infiltrate was evidenced, composed of small lymphocytes, histiocytes, plasmacells, and several eosinophils. Furthermore, several mono- or plurinucleated lymphoid cells were present, reminiscent of Reed-Sternberg cells, sometimes surrounded by a clear halo. At immunohistochemistry these cells showed cytoplasmic (often membranous) positivity for CD30 (Fig. 2), and negativity for CLA, CK, CD79 and CD3. The final diagnosis was Hodgkin's lymphoma.

The patient underwent chemotherapy in the Haematology-Oncology Department. The chest CT follow-up showed a great improvement: there was a reduction of the size of the primary lesion and the lymphadenopathy, and a great increase in the degree of mineralization of the sternum.

## 3. Discussion

A sternal swelling associated to thoracic pain and fever can be due to several conditions, such as neoplasms or inflammatory and infective processes. In the present case, the gender, age, and clinical history of the patient, as well as the inflammatory pattern observed, could suggest an inflammatory condition, namely the Tietze's syndrome [2].

The Tietze's syndrome was firstly described in 1921 as a benign, non-suppurative, painful swelling of the superior chondrosternal joints [2]. It is a quite common pathology [3], especially amongst adult women, and it may also follow a thoracic trauma [4]. The clinical manifestation is that of a generalized inflammatory state with a huge chondrosternal joints' oedema [5].

In particular, the personal history of a thoracic trauma due to a car accident could have explained the sub-acute onset of the symptoms. In fact, the oedema had appeared four months before the ED access. Moreover, the radiological aspects of an aggressive lesion, and the presence of an important mediastinal lymphadenopathy, confirmed by the PET/CT scan, ruled out the Tietze's syndrome [6].

A malignant tumour with high cellularity [7] or a tuberculous osteomyelitis [8,9] with lung involvement was also suspected. At first, any infectious etiology was excluded, with negative microbiological tests and cultures, including those for *Mycobacteria Tuberculosis*. Unfortunately, the ultrasound guide biopsies were inconclusive in relation to the clinical development, so the surgical biopsy became mandatory [10].

Hodgkin's lymphoma (HL), formerly called Hodgkin's disease, arises from germinal centre or post-germinal centre B cells [11]. HL has a unique cellular composition, containing a minority of neoplastic cells (Reed-Sternberg cells and their variants) in an important acute or chronic inflammatory background [11]. Because of the morphological characteristics of HL the diagnosis is not always straight forward [11,12]. Very few neoplastic diagnostic cells (Reed Sternberg cells) [13,14] are present within inflammatory tissues containing a variable number of small lymphocytes, eosinophils, neutrophils, macrophages, plasma cells, fibroblasts, and collagen fibers.

This case points out how challenging the diagnosis of Hodgkin's disease can be, and the impact that a diagnostic delay can have in the prognosis [15,16] of a life-threatening condition. The acute and atypical symptoms (pain, dyspnoea, sternal oedema) misled us, letting to the suspicious of a benign disease. Therefore, the correct diagnosis of Hodgkin's lymphoma was delayed as a result. Fortunately, in this case, the response to the specific chemotherapy has been good despite the delay in treatment.

## 4. Conclusions

In conclusion, mediastinal masses with an aggressive behaviour, confirmed at the chest CT scan or PET CT, should always be considered to be potentially malignant even if needle biopsy proves

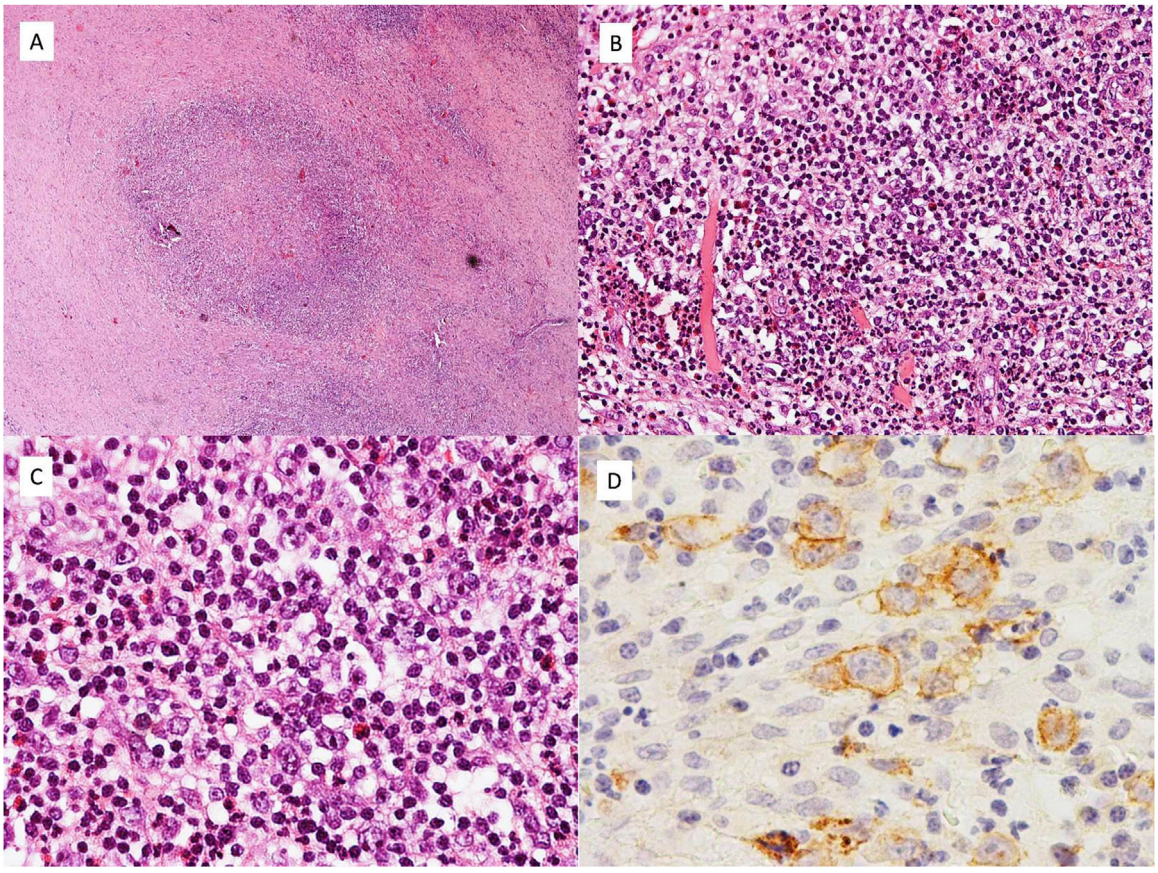


**Fig. 2.** Pathological images of the lesion: A) lymphoid nodule surrounded by fibrotic tissue (H&E, 20x), B) intralesional infiltrate composed of small lymphocytes, histiocytes, plasmacells, and numerous eosinophils (H&E, 200x), C) several mono- or plurinucleated lymphoid cells are evident, reminiscents of Reed-Sternberg cells, sometimes surrounded by a clear halo (H&E, 400x), D) these cells showed cytoplasmic (often membranous) positivity for CD30 (CD30, 600x).

negative for neoplastic cells. Surgical biopsy can be the only way to correctly diagnose the pathological process, especially in the case of Hodgkin's lymphoma in which few diagnostic cells (Reed-Sternberg cells) are generally embedded in an abundant inflammatory background tissue.

## Conflicts of interest

The authors have no conflicts of interest to declare

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## Ethical approval

This study is exempt from ethical approval in our institution.

## Informed consent

The patient has given informed consent for publication of this manuscript.

## Author contribution

Alessandro Fois wrote the paper. The other authors collected and analysed data and contributed to the final drafting of the manuscript.

## Registration of research studies

Our study does not require registration.

## Guarantor

Dr. Alessandro Giuseppe Fois.

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