CASE REPORT

Large mediastinal teratoma associated with severe pleural pericardial stroke due to perforation of both structures

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ABSTRACT

The case report of a 21 years patient is presented who is admitted to the Cardiology Service of "Saturnino Lora Torres" Teaching Clinical Surgical Provincial Hospital due to acute pericarditis of torpid course. When the computerized axial tomography of the mediastinal cavity was carried out, a teratoma associated with severe pleural pericardial stroke due to rupture of both structures was diagnosed. He was treated with extracorporeal circulation and the histologic diagnosis was confirmed.

Key words: mediastinal teratoma, pleural pericardial perforation, pericardial tamponade, severe pleural pericardial stroke, secondary health care.

INTRODUCTION

Mature teratoma is one of the germ cell tumors that occur with higher frequency in the mediastinal cavity. They are able to provoke rupture very rarely and due to certain mechanisms, as well as perforation of the adjacent structures such as lungs, bronchial tubes, pleura and pericardium.

However, mediastinal cavity is considered as a virtual cavity in the center of the thorax, that is related by both sides with the 2 pleural cavities, the bone structures of the upper thoracic strait in the upper position and the diaphragm in the lower position. Sternum limits it in the front part and the thoracic spinal cord in the back. This narrow anatomical space contains lots of organs and vital structures such as: heart, large vessels, esophagus, trachea, thymus, glands, nerves and derived tissues either from ectodermus or mesenchyma, that turn it into a site where numerous pathological disorders take place.

In general it is divided in three parts: anterosuperior, middle and posterior part. In the first we can find thymus, aortic cayado and its branches, veins in the brachiocephalic trunk, areolar and lymphatic tissues. The second contains the heart, pericardium, hilus of lung, tracheal bronchial glands, ascending aorta and aortic arch, cava, arteria and anonymous veins; as well as phrenic nerves, trachea, main bronchi, arteria and lung vein. The third is formed by the descending aorta, esophagus, thoracic duct, left azygos veins as well as posterior nodes.

It is important to emphasize that the development of non invasive images technique (echogram, echocardiogram, computerized axial tomography, magnetic

resonance) and the traditional invasive techniques (mediastinoscopy and biopsy) have favored the study of mediastinal cavity and the pathological disorders that are involved.

Among the most frequent pathological entities of the mediastinal cavity we can mention the chronic and acute inflammatory disorders (mediastinitis, very frequent complication in heart surgery), emphysema and mediastinal hemorrhages (postraumatic hemorrhage and others), intrathoracic extension of thyroids, tumoral persistence of thymus, aneurysms of aorta and its branches, aneurysms and heart pseudoaneurysms, systemic granules, diaphragmatic hernias, acalasia, diverticula and esophagus cancer, meningocele, tumoral metastasis, as well as cysts and primary tumors.

The most frequent tumors in the mediastinal cavity are timoma, germ and endocrine cells neoplasms (endothoracic, parathyroid and carcinoide goiter) and lymphoma among others.

Germ cell neoplasms are presented with more frequency in the anterosuperior mediastinal cavity, which are produced due to abnormal migration of such primitive germ cells during embryo genesis. There are different histological varieties such as: teratoma, teratocarcinoma, seminoma o germinoma, choryocarcinoma and embrionary carcinoma. Teraroma is the most frequent and represents the benign variety of germ cell tumors in 80% of the patients. Most of these tumors are mature, well differentiated and defined tumors and contain solid cysts areas or both, as well as rests of embrionary tissue; however they rarely become malignant.

About half of these entities are completely asymptomatic, in 50% of the patients are presented as a mediastinal tumoral syndrome and the rest are identified as unspecific secondary systemic syndromes or secondary immunological disorders. The most important symptoms are: dysnea, orthopnea, thoracic pain, cough, fever, weight loss, dysphagia and hemoptysis, which are caused by compression and invasion of adjacent structures or secondary infection.1,2

In many patients the diagnosis is casual. In some of them, a tumor in the mediastinal cavity can be found when the simple radiological study was carried out, in other patients, as in this study, signs and symptoms and some findings in the lateral and posterior anterior thorax radiography, as well as in the echocardiogram lead to an multi-section computerized axial tomography of the mediastinal cavity for the definition of the diagnosis.

CASE REPORT

The case report of a 21 years mixed race patient with history of certain health is described. He was admitted to the Cardiology Service of “Saturnino Lora Torres” Teaching Clinical Surgical Provincial Hospital in Santiago de Cuba with the diagnosis of assumed acute pericarditis (fever, thoracic pain, pericardium friction), because 15 days before he suffered from intermittent sharping thoracic pain of moderate intensity in the left hemithorax, that intensified in decubitus position and got better in sitting position, it migrated to the back with 38^{o}C fever in peaks; it got better with common antipiretics and it repeated without fixed periodicity along with respiratory distress. When establishing the simple protocol of study some disorders were found that made think in another possibility and when the multi-section CAT was carried out, a large tumor in the anterior mediastinal cavity was found that was a teratoma.

Physical examination

- Mucous membrane: Humid and normal colored mucous membrane
- Subcutaneous cell tissue: non infiltrated
- Respiratory examination: discreet vaulting of the left hemithorax decreasing thoracic expansion; breathing frequency: 22 per minute, a slight distension of the left hemithorax is found during palpation and decreasing of expansion, as well as elimination of vocal vibrations.
- Cardiovascular examination: neither visible non palpable apex beat, rhythmical heart noises with normal intensity, no heart murmur; pericardial friction is auscultated with prevalence of the systolic component. Heart rate: 105 beats/minute, no extratones; blood pressure: 110/60 mm/Hg.
  The rest of the physical examination showed no interesting data.

Complementary tests

- Hemogram: hemoglobin 108 g/L; white blood cells 8.6 x 19 p64 L34 Eo2
- Glycemia: 5.1 mmol/L
- Creatinine: 72 mmol/L
- Uric Acid: 291 mmol/L
- Bilirubin: direct: 2, indirect: 4.71, total 6.71
- Aspartate transaminase: 16 u/L
- Alanine transaminase: 16 u/L
- Total protein: 59.7; albumin: 34.6; globulin: 25.1 g/L
- Negative tuberculin test
- Serology: negative

Electrogram: no important changes where sinus rhythm is evident with unspecific disorders of ventricular repolarization.

Thorax x rays: slightly widen mediastinal cavity, pericardial bleeding and bilateral pleural bleeding to left prevalence with movement of the mediastinal cavity elements to the right (figure 1).

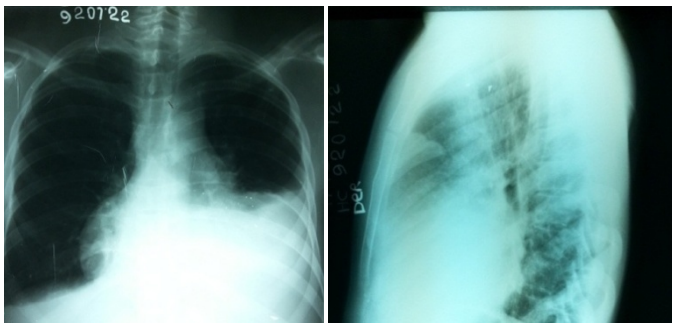

Fig 1. Pericardial bleeding (reversed cup image) and bilateral pleural bleeding to the left.

Bidimensional echocardiogram and color Doppler echogram: in the left parasternal and 4 chambers apical windows, a pericardial bleeding of great magnitude that occupied the whole pericardial sac was observed, without tamponade echocardiogram signs (figure 2).

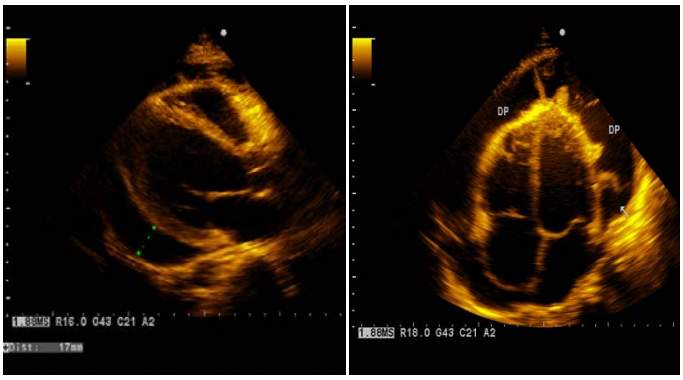

Fig 2. Pericardial bleeding of great magnitude that occupied the whole pericardium with plenty of fibrin.

Computerized axial tomography showed the presence of a tumoral mass with variable density, large size, well defined edges and calcification points that occupied the antero superior compartment of the mediastinal cavity associated with bilateral pleural and pericardial bleeding to the left of great magnitude, that was a teratoma according to its characteristics (figure 3).

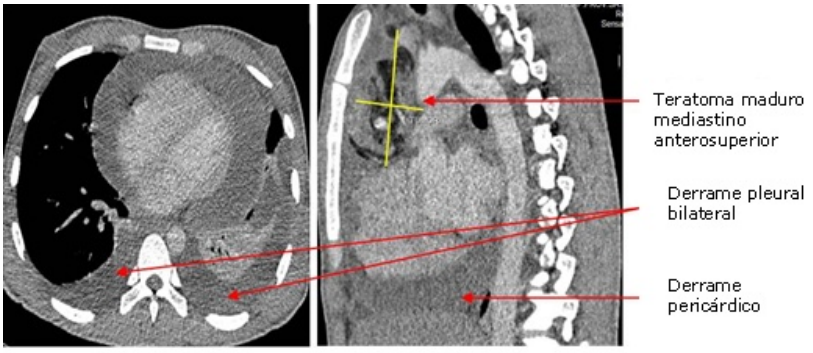

Fig 3. Mature teratoma associated with pleural pericardial bleeding of great magnitude

In the surgical report is important to point out what the surgeon said, who found the presence of a marked edema, inflammation, pleura and pericardium swelling that were very attached to the tumor, perforation of pericardium parietal leaf, as well as communication of the pericardial sac with the content and cavity of the tumor.

On the other hand, in the pathological report of the anatomical piece, it was described as a mass of defined borders, irregular surface with fibrosis areas and presence of some nodes that when processesed, they were yellow grey with cartilaginous areas, mucoide and others of epidermal aspect with hairy structures and cysts dilation with sebaceous content; so the diagnosis was a mature teratoma of the mediastinal cavity.

COMMENTS

As it is known, teratomas are the most frequent germ cell tumors; that are usually found in the antero superior mediastinal cavity where along with thymoma, mesoderm endocrine neoplasms and to a lesser extent lymphoma, constitute the neoplasm disorders that most frequently invade this mediastinal compartment.[3]

Its incidence is relatively low and may emerge at any age, although the higher numbers of cases are notified between the second and fourth decades of life.[4] In spite of the fact that the embrionary origin of these neoplasms is known, it is interesting its association with syndromes of hereditary character that mark an increase in the incidence of such tumors in the population, such as: Klinefelter, B trisomy, Down and Marfan syndromes.

It is also known that around 50% of cases keep free of symptoms once the neoplasm has been developed. To a great extent, clinical features can be observed when the size of the tumor is significant and its mass occupies more than the two thirds of a mediastinal compartment or it is extended to another compartment; so it is able to compress proximal structures and create a mediastinal syndrome or invade adjacent structures to give origin not only to their inflammation but also to unfrequent complications, such as perforations or rupture of the pleura and parietal pericardium, as well as the subsequent origin of bleedings in these cavities (pleural and/or pericardial) one of the causes of pericardial or pleural bleeding and although less frequent, the rupture, the bronchi and lung parenchyma perforation. [5,6]

These complications are not relatively frequent and even less their association, as it happened in the case studied. It is believed that the mechanism through which the pericardium or pleural perforation is produced and the posterior emergence of the bleeding is due to the tumor growth itself, to the increase of the pressure of the liquid in the cystic teratome, mechanical inflammatory disorder, to the traumatic tumoral effect, to the existence of digestive enzymes secreted by the intestinal mucous membrane or pancreatic tissue found within the teratome and weakening in the adherence site to the parietal leave of pleura and pericardium, which together with concurrent infections and the existence of abundant macrophages in the friction site, are the triggering factors of such complication. [7,8]

Among the most relevant clinical manifestations, which at the same time and in most of the cases are a synonym of the quick and important growing of the tumor there are: dysnea, thoracic pain, cough, fever, weight loss, upper cava vein syndrome, dysphagia, orthopnea and hemoptysis.

The pleural and/or pericardic bleeding of great magnitude is unfrequent, and its presence is to a great extent similar to malignancy;[8] however it did not happen this way in this case, as the rupture or perforation of pleural and pericardium through the above mentioned mechanisms. So, the originality and at the same time the motivation for sharing this work with the scientific community interested in this topic.

It is important to stress that the clinical diagnosis of primary tumors of the mediastinal cavity, represent a real challenge due to its great versatility and the heterogeneity of its clinical manifestations, although thanks to the development of non-invasive image techniques (multiple-sections computerized axial tomography, nuclear magnetic resonance, ultrasound, echocardiography in its different combined variants), and occasionally the invasive techniques (mediastinoscopy and fine-needle biopsy), a qualitative improve has been achieved in the approach and treatment of these disorders. [1,9]

Treatment of the mediastinal teratome consists of the complete exeresis of the tumor with curative aims, and has very good results. The surgical approach depends on the characteristics of the malignancy, such as,

localization, size, extension, compression, and invasion to proximal structures and on the patient general condition, as well on the scientific and technical level of the hospital.[4,8,10]

On this regard, the hospital where this study was carried out, has a Cardiology and Cardiovascular Service, with cardiovascular and general surgeons with experiences in thoracic surgery, that is why the decision of having a surgery as the approach to operate are previously discussed. Due to the characteristics of the tumor, in this patient it was decided to carry out the exeresis with extracorporeal circulation. After surgery, the patient had a favorable clinical course and without complications; he was discharged and was followed during a month, after 3,6 and 12 months, and he was finally discharged from this date on. When discharged, the pathological diagnosis of mature teratome of mediastinal cavity was confirmed.

It could be observed that the teratomes of the fore mediastinal cavity are unfrequent entities emerging at any age, but mainly within the second and fourth decades of life. Their relative incidence is around 11 %. They emerge asymptomatically in most of the cases and in a 50 % as a casual finding; in the same way that the presence of symptoms is a synonym of important and fast growing, the great bleeding in pleura and pericardium can be the expression of its unfrequent complications, the rupture and perforation of proximal structures.

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