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Case Report

Mixed Mediastinal Germ Cell Tumor: A Case Report

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Abstract:

Germ cell tumors constitute a heterogeneous group of neoplasms derived from primitive germ cells, arising as a consequence of an embryogenic error. A clinical case of a 16-year-old white male patient, with no previous pathological history or toxic habits, who was admitted to the internal medicine room for presenting a clinical picture of asthenia and anorexia was added, to whom light fever was added in evening schedule. Several examinations were performed, including: Immunohistochemistry, biopsy, Computed Axial Tomography, X-ray of the chest and Mixed germ cell tumor of Mediastinum was diagnosed. Chemotherapy was started. The prognosis of the disease depends on the precociousness with which the diagnosis and treatment are made.

Key words: Mixed germ cell tumor, mediastinal tumor, germ cell tumor

Introduction

Germ cell tumors constitute a heterogeneous group of neoplasms derived from primitive germ cells. They include benign germ cell tumors or teratomas, malignant tumors: choriocarcinoma, endodermal breast tumor and germinoma, or mixed tumors with immature teratoma components [1].

Germ cell tumors of the mediastinum arise as a consequence of an embryogenic error during the migration of germ cells to the gonads, they are rare, since they only represent between 2 and 4 percent of all cancers of children and adolescents younger than 20 years [2]. They also represent 50-75% of the extragonadal and 10-15% of the mediastinal, also 10-15% of the anterior mediastinal masses, are divided into: teratomas with a benign clinical course, malignant teratomas, non-seminomatous germ cell tumors of the mediastinum, and seminomas, these primary mediastinal seminomatous tumors are the most frequent malignant germ cell tumors, and occur only in young adult men between 20 and 40 years of age, as they are called dysgerminomas in women [3]. In many occasions these tumors are mixed, and one part can show a malignant pattern and another benign. This feature is of great

importance in relation to management, since the malignant part responds very well to chemotherapy, and it is not unusual to subsequently remove the benign portion that remains after treatment [2].

All variants of extragonadal germ cell tumors have the same histological characteristics as gonadal (testicular or ovarian), but their biological behavior and characteristics differ greatly. This supports the theory that extragonadal germ cell tumors arise from the primordial germ cells of the Yolk Sac or Urogenital Protuberance, which fail in their migration to the gonads during embryonal development [4].

Germ tumors are often malignant and symptomatic, and like other tumors of the mediastinum, they are usually detected with a chest x-ray showing a widening of the mediastinum. These anomalies generally present compression symptoms, the most frequent being: retrosternal pain, cough, dyspnea, dysphonia, diaphragmatic paralysis, hemoptysis and superior vena cava syndrome. The presence of general symptoms such as fever, weight loss, and general malaise is also expected [2,3]. Gynecomastia occurs in some patients due to the production of human beta-gonadotropin [3].

On chest CT, a bulky mass can be visualized with occasional invasion of adjacent structures, and therefore, together with magnetic resonance imaging (MRI) and biopsy for histological study, are the main complements for definitive diagnosis [2].

Chemotherapy and surgery for tumor resection is the most recommended therapy with the best prognosis [3].

Clinical case

16-year-old white male patient, with no previous medical history or toxic habits, who was admitted to the internal medicine room for presenting a clinical picture of asthenia and anorexia for approximately two months. In recent weeks, a slight fever is added in the afternoon.

Physical examination revealed cutaneous-mucous pallor. The rest of the physical examination was negative.

Laboratory analyzes were performed, finding alterations in: Hemoglobin 92 g / L, C-reactive protein 220mg / L. Rest of normal laboratory tests.

The plain chest radiograph showed a left mediastinal enlargement with a tumor appearance with partially defined edges, without the presence of pleuro-pulmonary or bone abnormalities with a normal cardio-thoracic index. (Figure 1)

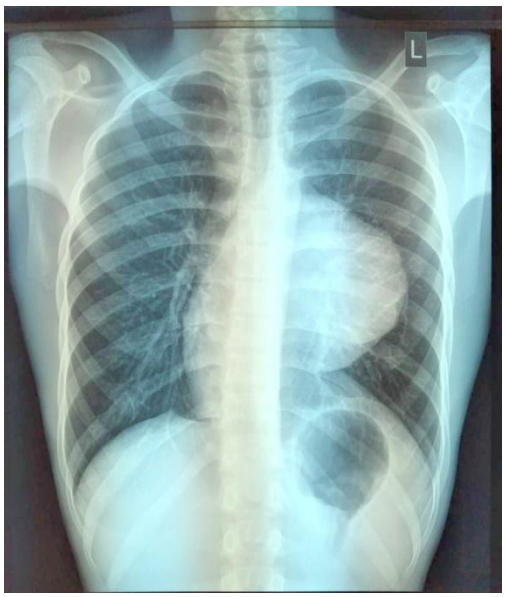

Figure1. PA chest radiograph showing left mediastinal widening.

In the computed tomography of the chest (CT thorax) medistinal image of tumor appearance measuring 133x100x127mm was observed, with areas of necrosis and vascularized, located at the level of the upper mediatin that compresses the vessels and cardiac area. Left pleural effusion, slight left pulmonary edema, no metastatic lesions in lung parenchyma or bone structures. (Figure 2)

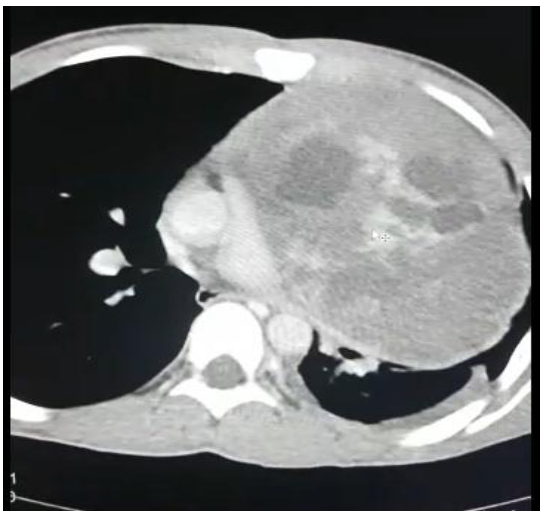

Figure2. Chest computed axial tomography. Mediastinal tumor.

The abdominal and testicular ultrasound did not show any alterations.

When performing a CT-assisted thoracotomy with a biopsy sample, several punches were taken from the lesion, which yielded:

Microscopy

Section studied shows clusters of infiltrating indifferentiated polygonal cells with clear cytoplasm, pleomorphism and mitosis in fibrovascularstroma. Focal necrosis and hemorrhage. There is cystic formation covered by round polygonal cells.

Inmunohistochemistry results:

CyclinD30 (CD 30): positive (focal in clusters)

Cyclin D 117 (CD 117): Positive (in clusters of cells)

Beta Human Chorianic Gonadotropin (BHCG): Positive (in both clusters of cells and cystic area)

Alpha fetoproteins (AFP): Positive (in both clusters of cells and cystic area)

Citokeratina (CK): Negative (in both clusters of cells and cystic area)

Epithelial membrana antigen (EMA): Positive (in cystic areas)

Vimentin: Positive (in cystic areas)

Diagnosis: Mixed germ cell tumor with components of seminoma, embryonal carcinoma and yolk sac tumor.

Treatment is started with BEP protocol, Bleomycin, etoposide and cisplatine for five days. To repeat 4 cycles. The patient has had a favorable response to treatment after three cycles. After chemotherapy treatment is complete, surgery will be performed to resect the residual tumor.

Discussion

Primary extragonadal mediastinal germ cell tumors (seminomas) are the most frequent malignant germinal tumors located in the anterior mediastinum in young adult men, between 20 and 40 years of age [2]. However, some authors report that they can present pure seminomatous or as a mixed germ cell tumor [5]. The case presented above coincides with this last criterion, when a mixed germ cell tumor was diagnosed, although, unlike what was found by other authors, in this case its presentation was before 20 years of age.

The authors suggest that the most frequent symptoms presented by patients with this entity are: chest pain, dyspnea, fever, weight loss, cough, hemoptysis, superior vena cava syndrome [2,3]. In the previous case, he only had asthenia, anorexia and light fever, at no time did he present respiratory symptoms, which is not common in these cases.

Generally, on physical examination of these patients, alterations of the vesicular murmur are found in the affected hemithorax [3], however, in the case presented, the physical examination only showed cutaneomucosal pallor, the examination of the respiratory system being negative.

The diagnosis was made by chest radiography, CT chest and biopsy with histochemical study. The chest X-ray PA showed the mediastinal widening and the CT thorax showed the medistinal image of tumor appearance with areas of necrosis and vascularized, located at the level of the upper mediatin with compression of the vessels and cardiac area. Small left pleural effusion and slight left pulmonary edema. As a result of the biopsy, Mixed germ cell tumor with components of seminoma, embryonal carcinoma and yolk sac tumor was found. The positivity of the examinations carried out to make the diagnosis of mixed mediastinal tumor, coincides with that found by other authors who affirm that the chest radiography, the CAT scan and nuclear magnetic resonance imaging (MRI), in addition to the biopsy for histological study, are the main examinations performed to reach the diagnosis of this entity [3,6].

The treatment used with the BEP protocol (Bleomycin, etoposide and cisplatine) is the most widely used in this type of tumor [1]. Chemotherapy, combined with surgery for tumor resection, has given the best prognostic results [3]. Generally, the malignant part of this type of mixed tumor is almost totally involved with chemotherapy, being possible the total

resection of the benign part of it by surgery, guaranteeing a good prognosis for life for the patient, according to the opinion of several authors [1-3], although some report that 50% of these patients will have a possibility of relapse [2]. Having diagnosed the pathology in early stages without metastases being found, further improves the prognosis in this particular case.

Conclusions

Germ cell tumors of the mediastinum are rare and mostly affect those younger than 20 years. They are often malignant and symptomatic. Chest radiography, CT and nuclear magnetic resonance (NMR), in addition to biopsy for histological study, are the main tests that make the diagnosis of the disease possible. Chemotherapy, combined with surgery for tumor resection, is the one that has given the best prognostic results and depends fundamentally on the early diagnosis and treatment of the tumor.

References

[1] Polanco-Sosa AL, Peña-Montemayor AK, Mireles-García AM. Tumor de células germinales mixto de ovario y una inusual combinación. GinecolObstetMex. 2020 febrero; 88(2):123-126. Disponible en: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=1&sid=2410f994-a7f6-4860-a3d4-8fa6decb8d22%40sdc-v-sessmgr02

[2] Hernández Benedicto R, Pila Pérez R, Rosales Torres P. Tumor de células germinales primario de mediastino (seminoma de mediastino). *Rev. ArchMed Camagüey* 2019; 23(1): 95-103. Disponible en:https://www.medigraphic.com/pdfs/medicocamaguey/amc-2019/amc191k.pdf

[3] Ramirez Pulua DA, Rimassa Díaz Granados AA; Ortiz Contreras WM; Moreno Bermúdez MI. Tumores germinales mediastinales**.** Revista Científica de Investigación actualización del mundo de las Ciencias 2019; 3(3): 316-344**.** Disponible en:http://www.reciamuc.com/index.php/RECIAMUC/ article/ download/279/295

[4] Soriano - Lorenzo J, Lima - Pérez M, Soriano - García JL. Coriocarcinoma de mediastino anterior en paciente masculino. 16 de Abril (Internet). 2020 (citado el día del mes del año); 59 (276): e736. Disponible en: http://www.rev16deabril.sld.cu/index.php/16_04/article/download/736/pdf_247

[5] Weissferdt A, Rodríguez Canales J, Liu H, Fujimoto J, Wistuba II, Moran CA. Primary mediastinal seminomas: a comprehensive immunohistochemical study with a focus on novel markers. Hum Pathol. 2015 Mar;46(3): 376-83.

[6] Beyer JP, Albers R, Altena J, Aparicio C, Bokemeyer J, Busch R, et al. Maintaining success, reducing treatment burden, focusing on survivorship: highlights from the third European consensus conference on diagnosis and treatment of germ-cell cáncer. Annals Oncol 2013 Apr 1;24(4):[aprox. 10 p.]. Disponible en: https://academic.oup.com/annonc/article/24/4/878/259259

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