



## Germ Cell Tumors in the Mediastinum

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Article Info	Abstract
<p><b>Article history:</b> Received 17 December 2023 Revised 09 October 2024 Accepted 11 April 2025 Available online 21 April 2025</p> <p><b>Keywords:</b> Mediastinum germ tumors; x-ray; USG; CT scan</p> <p><b>Correspondence:</b> muhhariss@gmail.com</p> <p><b>How to cite this article:</b> Muhammad Harris Sis Sulthansyah, Lilik Lestari. Germ Cell Tumors in the Mediastinum. MAGNA MEDIKA Berk Ilm Kedokt dan Kesehat. 2025; 12(1):79–86</p>	<p><b>Background:</b> Germ mediastinum tumors grow in the mediastinum and consist of teratoma, seminoma, and nonseminomatous. Cases of germ mediastinum tumors are rare. During the last decade, only two cases have been found at Dr. Ario Wirawan Lung Hospital, Salatiga, Indonesia.</p> <p><b>Objective:</b> Germ mediastinum tumor is a rare case. This paper aims to present a case report that would benefit the radiology database.</p> <p><b>Case Presentation:</b> Two male patients aged 18 and 19 were referred to radiology complaining of continuous shortness of breath and coughing. The shortness of breath does not decrease daily, so the patient uses a breathing apparatus to help reduce shortness of breath. The patient underwent chest X-rays, ultrasonography (USG), and computerized tomography (CT). Pleural effusion is seen, the Cor of the right heart border is good, the heart border is covered with a homogeneous covering, and the location of the heart is pushed to the right. The USG results showed a lot of pericardial effusion, a hyperechoic lesion with clear boundaries, a round, oval shape, lobulated with enormous size, vertical, right vertical, left atrium, and right atrium, aortic pressing lesion. The CT scan showed isohypodense lesions in the form of lobulated, partially indistinct boundaries, forced injection of contrast appeared inhomogeneous enhancement, the right lung had an increased bronchovascular pattern, and patches appeared on the dextra lung.</p> <p><b>Conclusion:</b> The radiological imaging with x-ray, USG, and CT scan revealed that the patient found a mass in the mediastinum with firm boundaries, a round oval, homogeneous structure, fluid in the pericardial effusion, flat edges, and a homogeneous structure. Based on the findings, it can be concluded that radiological imaging can play a role in detecting germ mediastinum tumors.</p>
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## INTRODUCTION

Germ mediastinum tumors grow in the mediastinum,<sup>1</sup> which consists of teratoma, seminoma, and nonseminomatous.<sup>2</sup> It is namely the cavity in the middle of the chest located from the thoracic entrance to the diaphragm between the left and right pleural cavities containing vital structures of the circulatory, respiratory, digestive, and nervous systems<sup>3</sup>. Germ mediastinum tumors are most commonly caused by thymoma, teratomas, thyroid disease, and lymphoma. These cause symptoms of cough, chest pain, and shortness of breath.<sup>1</sup> Patients with these tumors often experience chest pain and dyspnea with a prolonged course.<sup>4</sup>

Radiological examinations that are often used for Germ mediastinum tumors are chest X-rays,<sup>5</sup> Ultrasonography (USG),<sup>6,7</sup> and Computed Tomography Scan (CT Scan).<sup>8,9</sup> CT scans are used to detect masses or tumors in the mediastinum<sup>10</sup>. The imaging method of choice for prevascular mediastinum masses is CT scanning, as it combines high spatial and temporal resolution with the ability to determine tissue composition and detect fluid components, as well as fat areas and classification.<sup>11</sup> Fluoroscopic CT-guided percutaneous needle core biopsy of a mediastinum mass is an effective and safe procedure for assessing patients with mediastinum tumors.<sup>12</sup> The radiological results often find masses in the mediastinum, pleural effusion,<sup>13</sup> pericardial effusion, and ascites.

Several scholars have reported mediastinum tumors, with locations in the left thoracic cavity and mediastinum,<sup>14</sup> in the yolk sac,<sup>15</sup> in the

right anterior mediastinum,<sup>16</sup> and in the anterior mediastinum.<sup>17</sup> However, cases of germ mediastinum tumors are rare.<sup>2</sup> During the last decade, only two cases were found at Dr. Ario Wirawan Lung Hospital in Salatiga, Indonesia. The novelty of this case report is that it emphasizes a recurrent germ cell tumor mediastinum. Even though the patient had received radiotherapy and was referred to another hospital, the tumor in the mediastinum appeared again. Therefore, this paper aims to present two cases of mediastinum germ tumors by discussing the characteristics of radiology's role in diagnosing these tumors.

## CASE PRESENTATION

Two male patients aged 18 years and 19 years came to the hospital radiology room complaining of continuous shortness of breath, accompanied by coughing. As the days go by, the shortness of breath does not decrease, so the patient uses a breathing apparatus to help reduce shortness of breath. The initial clinical diagnosis is that the tumor is compressing and invading organs in the mediastinum, including the lungs. The patient underwent a thorax x-ray, ultrasonography, and CT scan to determine the diagnosis of the disease he was suffering from.

Chest x-ray showed a mass in the mediastinum, firm boundaries, round oval, homogeneous structure, and visible left pleural effusion. Cor of the right border of the heart was good; the left border of the heart was covered with a homogeneous sheath, and the location of the heart was pushed to the right. The results of the photo of the lung showed that the visualized correct pulmonary vascular pattern

appeared to be close, and there were no visible spots in the visualized right lung field. Furthermore, it was discovered that there was a homogeneous sheathing on the left hemithorax's retronasal applicator accompanied by the pressure of the heart and mediastinal structures to the right of the right hemidiaphragm at the level of costa 8-9 posteriorly. Other results showed that the right and left pointed cosphophrenic sinus was covered with a homogeneous sheath. Ultrasound results showed that there was a lot of pericardial effusion, hyperechoic lesions with clear boundaries, round oval shape, lobulated with substantial sizes, vertical, right vertical, left atrium, and right atrium, visible pressing lesions on the aorta accompanied by calcification (+). CT scan imaging results with contrast thorax showed an isohypodense lesion with a lobulated shape, partially indistinct boundaries, forced contrast injection showing inhomogeneous enhancement, the right lung had bronchovascular patterns that appeared to be increasing, and spots were visible on the right lung. In the left lung, bronchovascular patterns increase, and spots appear in the left lung. The following results showed that left pleural effusion appeared, pericardial effusion appeared, the trachea appeared to be compressed by the mass, the bronchus appeared to be compressed by the mass, and the esophagus appeared to be compressed.

The impression obtained is that there is a wide pericardial effusion, a mass in the mediastinum (the ultrasound probe is not enough to measure) located in the anterior, middle, and posterior mediastinum. The heart and aorta have clear boundaries, a round, oval shape, and a mixed structure accompanied by calcification (+). The dimensions of the heart

chambers did not appear to be restricted, there was no narrowing of the heart valves, global wall motion appeared neurokinetic, and the left vertical function ( $ef= 66.3\%$ ) was normal (Figure 2).

The results of CT scan imaging with contrast thorax in Figure 3a shows that an isohypodense lesion (CT number 28-40 HU) is lobulated with partially indistinct borders measuring seven increases, and spots appear on the right lung. In the left lung, bronchovascular patterns increase, and spots appear in the left lung. The following results showed that left pleural effusion appeared, pericardial effusion appeared, the trachea appeared to be compressed by the mass, the bronchus appeared to be compressed by the mass, and the esophagus appeared to be compressed. The right and left thyroids are not enlarged, and there is no visible mass. Cor seems to be pushed by the masses towards the postero-inferior. The aorta is not dilated, there is no classification, and lymphadenopathy is visible in the upper-lower paratracheal and mediastinal areas. In the liver, homogeneous parenchyma appears, but no nodules are visible. The spleen has homogeneous parenchyma, but no nodules are visible. In the right and left kidneys, there were no visible stones or masses, no visible suprarenal masses on the right and left, and no ascites.

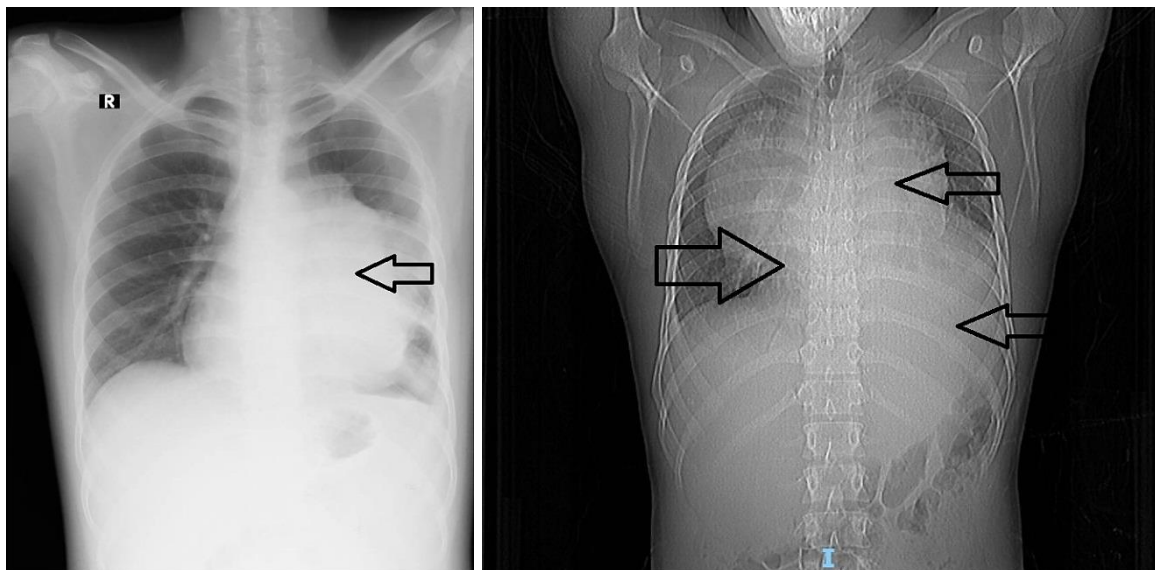
The results of the subsequent CT scan revealed a lobulated solid mass in the mediastinum (size 20.9x18.7). Apart from that, pneumonia in the right and left lungs, multiple lymphadenopathy in the right and left upper-lower paratrachea, and mediastinal. There was pericardial effusion, left pleura effusion, no ascites, bilateral pleural thickening, and no

nodules in the liver, kidney, or suprarenal area.

The CT scan results in Figure 3b show an isodense lesion (CT number + 45–56 HU) of round, oval shape, firm boundaries, regular in the anterior mediastinum, size (13.2 x 9, 9 x 12.3 cm). After the contrast injection, an enhancing lesion appeared; the right lung had broncho-vascular patterns that seemed to increase, patchy opacity appeared in the right lung, and no ground glass opacity lesion was seen in segment 4.5 of the left lung. The right and left pleura thickened, and pleural effusion was seen. Other results are that the trachea is not compressed, the bronchus is not narrowed, the esophagus is not widened, the COR is not enlarged in shape and size, and there is minimal pericardial effusion. Furthermore, the aorta was not dilated, classification appeared, lymphadenopathy in the tracheal, aorta, and axilla with the largest size of 1.2 x 0.4 cm. No osteophytes were visible in the visualized bone sections, and no lytic, sclerotic, or destruction lesions were visible.

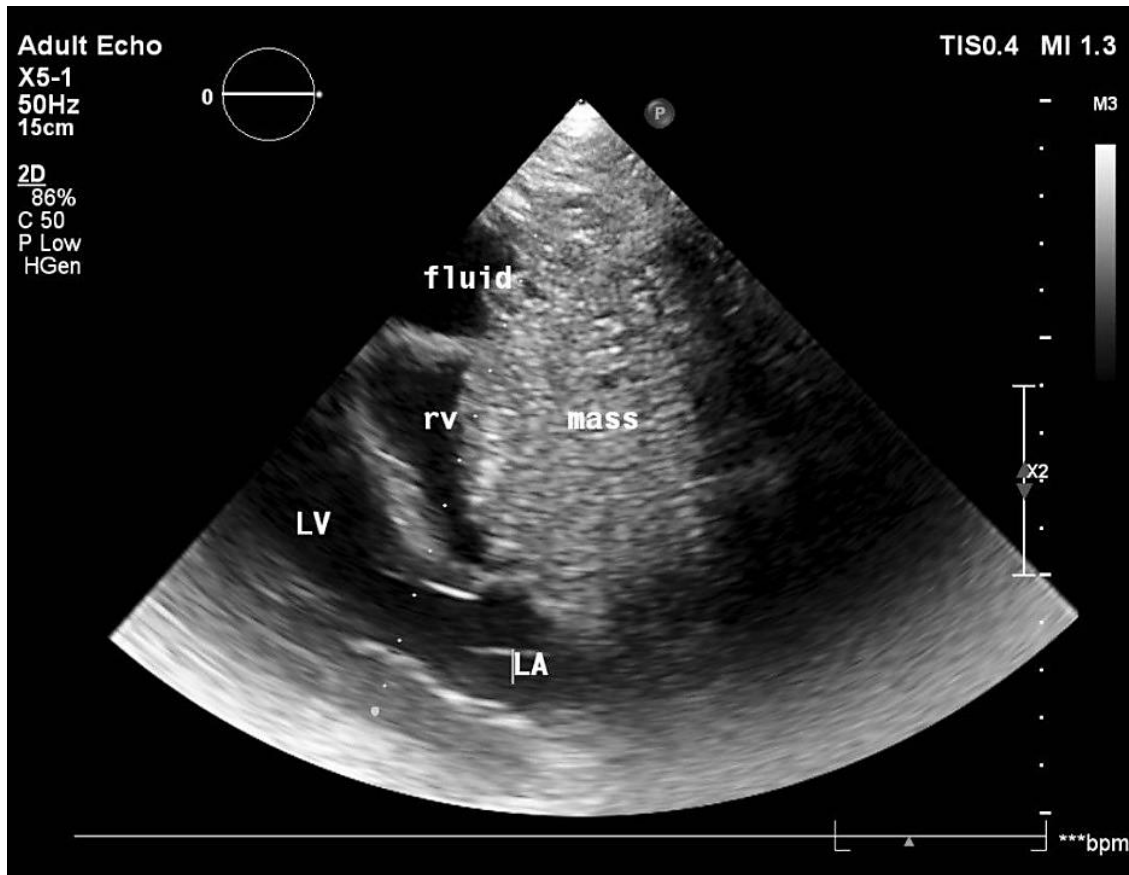
On a visualized abdominal section, the liver is of normal shape and size, with regular edges, sharp liver tip, homogeneous parenchyma, and no visible nodules. The spleen is normal in shape and size, with homogeneous parenchyma and no visible nodules. The right and left kidneys are normal in shape and size, the parenchyma is homogeneous, and there are no visible stones/masses. There were no visible right or left suprarenal masses and no ascites.

Based on radiological imaging results, the first patient underwent cryosurgery using argon and helium gas in CT Scan Room 128. The second patient was given medical intervention for mediastinum tumor surgery, followed by chemotherapy and cryosurgery until the patient had no complaints. A team of doctors from thoracic surgery, internal medicine, heart disease, and diagnostic radiology carries out radiological therapy. After surgery, radiation therapy continues. However, after surgery, germ cell tumors appeared again in the mediastinum.

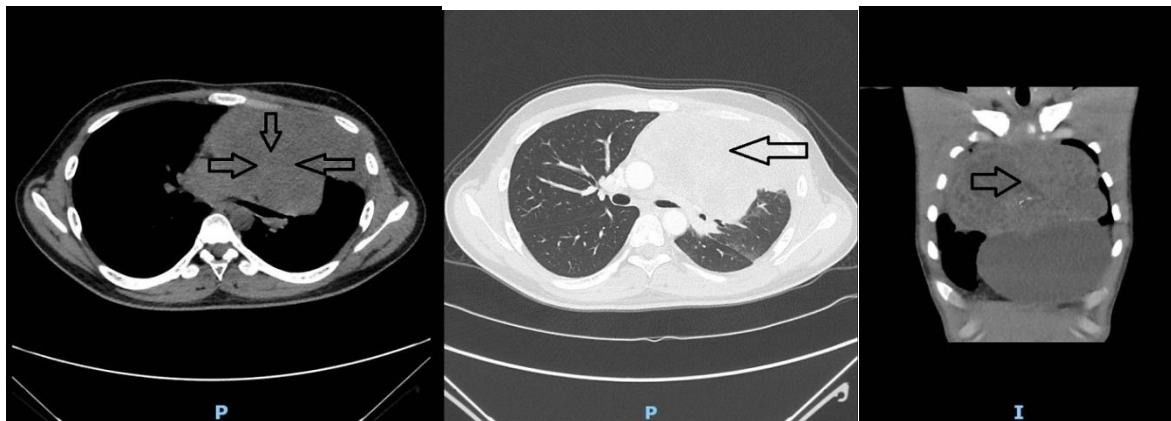


**Figure 1.** X-Photo Thorax in Germ Cell Tumors in the Mediastinum found a mass in the mediastinum, firm boundaries, round oval, homogeneous structure, and visible left pleural effusion.





**Figure 2.** The heart ultrasound revealed a mass in the mediastinum with firm boundaries—a round, oval, homogeneous structure. There is fluid in the pericardial effusion. The dimensions of the heart chambers do not appear enlarged. Note: LV = left ventricle, RV = right ventricle, Left atrium



**Figure 3.** The CT scan showed a mass in the mediastinum, firm boundaries, round oval, flat edges, and homogeneous structure.

## DISCUSSION

Mediastinum germ tumors are mostly benign, but some are malignant. These tumors grow in the mediastinum and develop in the germ

cell type.<sup>18</sup> Mediastinum germ cell tumors are a heterogeneous group of benign and malignant neoplasms originating from primitive germ cells remaining in the mediastinum during early embryogenesis. The anterior medias-

tinum is the most common primary location of extragonadal germ cell tumors.<sup>19</sup>

Referring to Figure 1, the impression obtained in Cor patients is challenging to assess; the right pulmo visualized with the pattern appears closed. The left pleural effusion was massive, and the possibility of a mass or atelectasis could not be ruled out. This finding aligns with prior studies that show that mediastinum germ cell tumors are a type of tumor that grows in the mediastinum.<sup>20-24</sup> They develop in a kind of cell called germ cells. There are different types of mediastinum germ cell tumors, and some mediastinum germ cell tumors are noncancerous or benign.<sup>25</sup>

Further imaging with a CT scan showed a mass in the mediastinum with clear boundaries, so it was diagnosed as an indication of a malignant tumor. Mediastinum germ tumors are challenging to study because their incidence is infrequent.<sup>7</sup> This makes assumptions very difficult; in the early stages, no symptoms appear. Specifically, in this case, a malignant and recurrent mediastinum tumor was found, even though it had been surgically removed along with radiation followed by chemotherapy.

A limitation of this study is that a Positron Emission Tomography (PET) scan has not been performed, which helps determine staging for malignant mediastinal tumors. Further research can be carried out with a PET scan so that the stage of the tumor can be determined.

## CONCLUSION

X-rays, ultrasonography, and computed tomography scans can show the presence of a

mass in the mediastinum with firm boundaries, round oval, homogeneous structure, pericardial effusion fluid, flat edges, and homogeneous structure. Radiological imaging can play a role in detecting mediastinum germ tumors.

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