International Journal of Surgery Case Reports 97 (2022) 107478

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

A case of primary mediastinal seminoma with superior vena cava syndrome and large intracardiac thrombus

Vicky Reinold Christofel Rampengan, Arief Bakhtiar *

Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

ARTICLE INFO

Keywords:
Large thrombus
Lung cancer
Mediastinal seminoma
Superior vena cava syndrome

ABSTRACT

Background: Primary mediastinal seminoma is rare, especially with complications of superior vena cava syndrome (VCSS) and large thrombus.
Case presentation: A 23-years-old Indonesian male complained of dyspnea, phlegm cough, chest pain, and body weight loss. The patient experienced swelling in the face and neck 1 week ago, accompanied by increased jugular venous pressure. Radiological results showed a firm mass in the right area of the mediastinum. Tumor marker and IHC results showed mediastinal seminoma. Electrocardiography showed sinus tachycardia, right axis deviation, and V1-V5 slow R wave progression. Echocardiography showed an intracardiac mass (RA protrusive RV, size 7.2 × 3.8 cm) with an intracardiac thrombus and RV failure. The patient was positioned in a semi-Fowler's position and given furosemide 3 × 20 mg, dexamethasone 3 × 5 mg, and warfarin 1 × 4 mg. Meanwhile, the results of the biopsy revealed a malignant germ cell tumor. When the patient was going to have bronchoscopy and radiotherapy planned, the patient died.
Discussion: Reporting primary mediastinal seminoma cases with complications of VCSS and large thrombus has a high risk of mortality, so this report can be used as a review to improve management in future.
Conclusion: Mediastinal seminoma with complications has a high mortality.

1. Introduction

Primary mediastinal seminoma was unusual tumors mixed germ cell tumor, which is reported in 1–4 % of cases [1]. Usually, these cases occur in men aged 20–40 years, and as many as 30 % of patients do not have any symptoms. In addition, as many as 10 % of cases of primary mediastinal seminoma are reported to have superior vena cava syndrome (VCSS) [2]. Meanwhile, the incidence of thrombus in primary mediastinal seminoma is infrequent, and there are no reports regarding its prevalence [3]. Based on SCARE 2020 guidelines, we report an Indonesian male with primary mediastinal seminoma, VCSS, and large thrombus [4].

2. Case presentation

A 23-years-old Indonesian male complained of dyspnea, phlegm cough, and chest pain. Dyspnea has been felt for 1 month ago and has worsened for 2 days. Phlegm cough has been felt for 2 months ago with white phlegm and not accompanied by night sweats. Chest pain has been coming and going for 2 months ago. The patient experienced swelling in the face and neck 1 week ago, accompanied by increased jugular venous pressure. The patient also lost 5 kg in weight. The patient had no previous health problems, both allergy and comorbid disease. The patient appeared debilitated, respiratory rate of 24 ×/min and SO2 of 97 % with a nasal cannula of 3 L/min. Cell wall movement asymmetries (right lung) and collateral veins are visible. In 1/3 right hemithorax, fremitus decreased, dim percussion, and low vesicular. There is swelling in the upper and lower extremities. Chest X-ray showed homogeneous opacity with flattened edges and obtuse angles in the right hilar and para cardiac areas (Fig. 1). A thoracic CT scan showed a solid anterior mediastinal mass at the lobulated margin of 7.1 × 9.9 × 11.1 cm (Fig. 2).

Laboratory examination revealed a white blood count of 17.470/μL, granulocytes of 84.4 %, albumin of 3.3 g/dL, SGOT of 292 U/L, SGPT of 304 U/L, and sodium of 123 mmol/L. Blood gas analysis, pH of 7.48, pCO2 of 21 mmHg, pO2 of 77 mmHg, HCO3 of 15.3 mmol/L, BE of −8.4, and SO2 of 96 % (nasal cannula of 3 L/min). Sputum culture and GeneXpert were not detected. Pulmonary function test indicated obstructively. Electrocardiography showed sinus tachycardia, right axis

* Correspondence to: A. Bakhtiar, Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Hospital, Jl. Mayjend Prof. Dr. Moestopo No. 6-8, Airlangga, Gubeng, Surabaya, East Java 60286, Indonesia.
E-mail address: aariefbakhtiar@gmail.com (A. Bakhtiar).

https://doi.org/10.1016/j.ijscr.2022.107478
Received 18 June 2022; Received in revised form 31 July 2022; Accepted 1 August 2022
Available online 3 August 2022

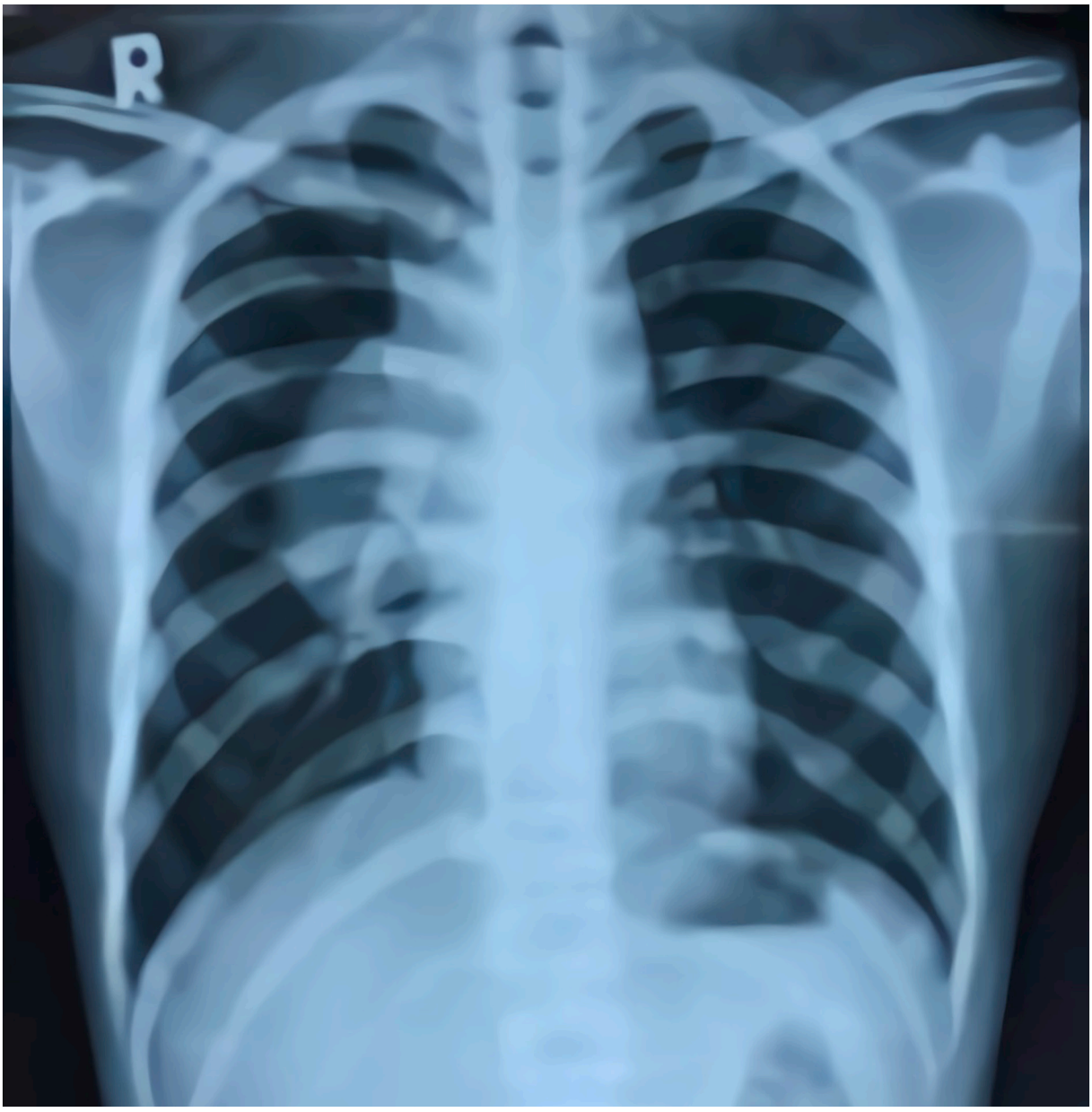

Fig. 1. Chest X-ray patient showed a mass in the right mediastinum.

deviation, and V1-V5 slow R wave progression. Echocardiography showed an intracardiac mass (RA protrusive RV, size 7.2 × 3.8 cm) with a sizeable intracardiac thrombus and RV failure.

For several days of treatment, the patient experienced severe shortness of breath, and the patient was planned to be installed on a mechanical ventilator, but the guardian/family declined. The patient was positioned in a semi-Fowler's position and given furosemide 3 × 20 mg, dexamethasone 3 × 5 mg, and warfarin 1 × 4 mg. During the treatment, the patient underwent additional examinations such as core biopsy, immunohistochemical (IHC), and tumor marker, which all pointed to mediastinal seminoma. IHC results included CD45 (negative), CD30 (negative), placental alkaline phosphatase/PLAP (positive), and CD117 (positive). Tumor markers were Lactic Acid Dehydrogenase (LDH) of 792 U/L, beta chorionic gonadotropin (β-HCG) of 30.65 mIU/mL, and alpha-fetoprotein (AFP) of ng/mL. Meanwhile, the results of the biopsy revealed a malignant germ cell tumor. When the patient was going to have bronchoscopy and radiotherapy planned, the patient died.

3. Discussion

Seminomas do not have a characteristic or specific appearance in the radiological aspect [5]. A CT scan usually presents a seminoma as an essentially homogeneous, non-encapsulated, sometimes lobulated mass, which may compress or invade surrounding tissues. It may accompany a pleural or pericardial effusion [5,6]. In mediastinal tumors, serum tumor markers were examined, including AFP, β-HCG, and LDH [7]. In pure seminomas, the concentration of β-HCG is sometimes slightly elevated, and AFP remains normal. If there is an increase in the concentration of -HCG and AFP, the diagnosis of a non-seminoma germ cell tumor should be considered [8,9]. IHC examination is needed to differentiate mediastinal seminomas from other types of mediastinal tumors. The placental alkaline phosphatase (PLAP) test is often positive in mediastinal seminomas. CD117 is usually positive for the cell membrane or para nuclear [1,5].

Diagnosis of VCSS is based on clinical findings. Usually in the form of swelling of the face and neck. Other symptoms include upper extremity

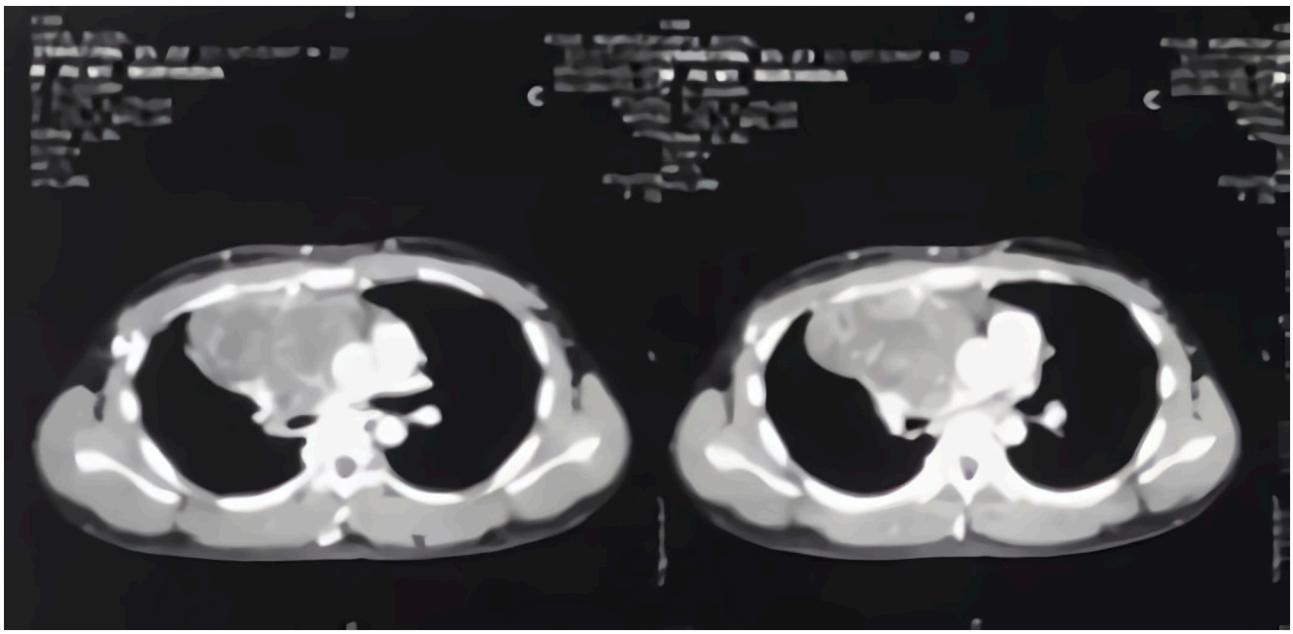

Fig. 2. A thoracic CT scans.

swelling, shortness of breath, cough, dysphagia, hoarseness, distention of collateral veins, and elevated JVP [3,10]. Continuous elevation of venous pressure can be life-threatening, as can laryngeal, bronchial and cerebral edema [11]. Radiological examination, such as a CT scan of the thorax, can provide more detailed information and the extent of venous obstruction, collateral venous drainage pathways, and identification of disease-causing VCSS [12]. Intracardiac masses can be either neoplastic or nonneoplastic, with 75 % of the lesions being benign [13]. Thrombus is the most common intracardiac mass [14].

Seminoma treatment consists of chemotherapy and radiotherapy. Mediastinal seminoma is a radiosensitive tumor with a radiation dose of 4500–5000 cGy [2,15,16]. Approximately 65 % of patients recover with radiotherapy. In recent years, the role of chemotherapy has been further developed in the treatment of mediastinal seminoma. The platinum-based chemotherapy regimen for seminomas consists of bleomycin, etoposide, and cisplatin [8,9,17]. Some investigators have concluded that cisplatin chemotherapy relieves 85 % of patients [2,18]. Combining chemotherapy with radiotherapy can improve the prognosis by 100 % [8,19].

Treatment of VCSS depends on the cause and severity [11]. Management includes 45^0 head elevation, administration of oxygen, diuretics, intravenous corticosteroids, surgery (only for benign causes), radiotherapy, chemotherapy and superior vena cava stent (with or without thrombolysis or anticoagulation) [11,12]. Only chemotherapy compared with combination chemotherapy-radiotherapy gave the same results. However, combination therapy can reduce VCSS recurrence [10]. The prognosis of mediastinal seminoma with VCSS and thrombus is inferior, with a high mortality rate [10,12]. Death within 30 days and recurrent thrombosis within 10 years are common in VCSS patients [3].

4. Conclusion

Primary mediastinal seminoma with complications of VCSS and large thrombus is a rare case. The diagnosis of mediastinal seminoma was confirmed by tumor marker and IHC results. Mediastinal seminoma with complications has a high mortality.

Guarantor

Arief Bakhtiar is the person in charge of the publication of our manuscript.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Funding

None.

Ethical approval

Not applicable.

Consent

Written informed consent was obtained from the guardian/patient family for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Research registration

Name of the registry: -.
Unique Identifying number or registration ID: -.
Hyperlink to your specific registration (must be publicly accessible and will be checked): -.

Credit authorship contribution statement

All authors contributed toward data analysis, drafting and revising the paper, gave final approval of the version to be published and agree to be accountable for all aspects of the work.

Declaration of competing interest

Vicky Reinold Christofel Rampengan and Arief Bakhtiar declare that they have no conflict of interest.

Acknowledgement

We would like thank to our editor, “Fis Citra Ariyanto.”

References

[1] A. Napieralska, W. Majewski, W. Osewski, L. Miszczyk, Primary mediastinal seminoma, J. Thoracic Dis. 10 (7) (2018) 4335–4341, https://doi.org/10.21037/jtd.2018.06.120.

[2] X. Xu, C. Sun, L. Zhang, J. Liang, A case of mediastinal seminoma presenting as superior vena cava syndrome, Intern. Medicine (Tokyo, Japan) 51 (10) (2012) 1269–1272, https://doi.org/10.2169/internalmedicine.51.7274.

[3] A. Wanous, I.R. McPhail, J.F. Quevedo, N.P. Sandhu, Mediastinal seminoma presenting with superior vena cava syndrome, BMJ Case Rep. 2017 (2017), https://doi.org/10.1136/bcr-2016-218282.

[4] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. (London, England). 84 (2020) 226–230, https://doi.org/10.1016/j.ijsu.2020.10.034.

[5] A. Rizki, L. Wulandari, A 28-year-old man with mediastinal seminoma treated with BEP, Folia Medica Indonesiana 57 (4) (2021) 351–356, https://doi.org/10.20473/fmi.v57i4.21037.

[6] R. Risnawati, L. Wulandari, Tumor Mediastinum anterior (yolk sac tumor) pada Seorang Laki-Laki Dewasa Muda: Sebuah Kasus yang Jarang: [yolk sac tumor in a young man: a rare case], Jurnal Respirasi. 2 (2) (2016) 45–51, https://doi.org/10.20473/jr.v2-I.2.2016.45-51.

[7] P. Desilva, D. Datta, Seminoma presenting as a mediastinal mass in an elderly patient, Conn. Med. 79 (9) (2015) 527–530.

[8] C.S. Kao, C.D. Bangs, G. Aldrete, A.M. Cherry, T.M. Ulbright, A clinicopathologic and molecular analysis of 34 mediastinal germ cell tumors suggesting different modes of teratoma development, Am. J. Surg. Pathol. 42 (12) (2018) 1662–1673, https://doi.org/10.1097/pas.0000000000001164.

[9] S. Parini, P. Spina, E. Papalia, R. Boldorini, M. Abruzzese, O. Rena, Primary seminoma arising in the posterior mediastinum: a diagnostic challenge, Monaldi Arch. Chest Dis. 92 (2) (2021), https://doi.org/10.4081/monaldi.2021.2028.

[10] C. Straka, J. Ying, F.M. Kong, C.D. Willey, J. Kaminski, D.W. Kim, Review of evolving etiologies, implications and treatment strategies for the superior vena cava syndrome, Springerplus 5 (2016) 229, https://doi.org/10.1186/s40064-016-1900-7.

[11] K. Talapatra, S. Panda, S. Goyle, K. Bhadra, R. Mistry, Superior vena cava syndrome: a radiation oncologist's perspective, J. Cancer Res. Ther. 12 (2) (2016) 515–519, https://doi.org/10.4103/0973-1482.177503.

[12] B. Pech-Alonso, C. Fermín-Hernández, S.I. Saavedra-de Rosas, R.J. Cicero-Sabido, Superior vena cava syndrome: clinical considerations, Revista Médica del Hospital General de México 81 (2) (2018) 59–65, https://doi.org/10.1016/j.hgmx.2017.03.004.

[13] S. Tatli, M.J. Lipton, CT for intracardiac thrombi and tumors, Int. J. Cardiovasc. Imaging 21 (1) (2005) 115–131, https://doi.org/10.1007/s10554-004-5342-x.

[14] M. Castrichini, S. Albani, B. Pinamonti, G. Sinagra, Atrial thrombi or cardiac tumours? The image-challenge of intracardiac masses: a case report, Eur. Heart J. Case Rep. 4 (2) (2020) 1–6, https://doi.org/10.1093/ehjcr/ytaa026.

[15] J. Wang, N. Bi, X. Wang, Z. Hui, J. Liang, J. Lv, et al., Role of radiotherapy in treating patients with primary malignant mediastinal non-seminomatous germ cell tumor: a 21-year experience at a single institution, Thoracic Cancer 6 (4) (2015) 399–406, https://doi.org/10.1111/1759-7714.12190.

[16] A. Laitupa, L. Wulandari, Efficacy of gefitinib and erlotinib in non-small-cell lung carcinoma, New Armenian Med. J. 13 (3) (2019) 4–10.

[17] C. Fitzmaurice, D. Abate, N. Abbasi, H. Abbastabar, F. Abd-Allah, O. Abdel-Rahman, et al., Global, regional, and National Cancer Incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 1990 to 2017: a systematic analysis for the global burden of disease study, JAMA Oncol. 5 (12) (2019) 1749–1768, https://doi.org/10.1001/jamaoncol.2019.2996.

[18] S.H. Fatemi, B. Shahid, H.M. Hanif, M. Muzaffar, Mediastinal seminoma presenting as superior vena cava syndrome and tracheal obstruction, J. Pak. Med. Assoc. 60 (10) (2010) 861–862.

[19] P. Giannatempo, T. Greco, L. Mariani, N. Nicolai, S. Tana, E. Farè, et al., Radiotherapy or chemotherapy for clinical stage IIA and IIB seminoma: a systematic review and meta-analysis of patient outcomes, Ann. Oncol. 26 (4) (2015) 657–668, https://doi.org/10.1093/annonc/mdu447.