Iranian Heart Journal; 2022; 23 (4)

Case Report

A Giant Pericardial Cyst With Uncommon Presentations in a Woman After Treated COVID-19 Infection: A Rare Case Report

Reza Ghasemi[1], MD; Ali Azari[2], MD; Fatemeh Moodi[3], MD; Saeed Moushekaf[4], BS; Mohsen Yaghubi[5*], MS

ABSTRACT

Pericardial cysts are a scarce cause of mediastinal masses. They are usually asymptomatic, even in large sizes. Accurate diagnosis of pericardial cysts is possible with multiple diagnostic imaging modalities. A 41-year-old woman complaining of bilateral lower limb edema, exertional dyspnea, and recurrent palpitations was admitted to our emergency department. She had experienced a syncope state. Echocardiography showed a reduced right-side heart function due to a large cystic-like mass at the supradiaphragmatic right paracardiac region with a compressive effect on the right heart. A computed tomography scan confirmed the presence of a giant pericardial cyst. The patient underwent cardiac surgery to excise the mass, 15×13.5×3.5 cm in size. This case report shows that huge right-sided pericardial cysts must be considered in the differential diagnosis of right-sided heart failure. The preferable and reasonable approach to a patient with a huge pericardial cyst is surgical excision for symptom alleviation, early identification, and removal. ***(Iranian Heart Journal 2022; 23(4): 109-114)***

KEYWORDS: Pericardial cyst, Mediastinum, Echocardiography

[1] Department of Cardiology, 9 Day Hospital, Torbat Heydariyeh University of Medical Sciences, Torbat Heydariyeh, IR Iran.
[2] Department of Cardiac Surgery, Razavi Hospital, Imam Reza International University, Mashhad, IR Iran.
[3] Department of Echocardiography, Razavi Hospital, Imam Reza International University, Mashhad, IR Iran.
[4] Department of Critical Care, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, IR Iran.
[5] Department of Extracorporeal Circulation (ECC), Razavi Hospital, Imam Reza International University, Mashhad, IR Iran.

*** Corresponding Author:** Mohsen Yaghubi, MS; Department of Extracorporeal Circulation (ECC), Razavi Hospital, Imam Reza International University, Mashhad, IR Iran.
Email: n.m.yaghubi@gmail.com **Tel:** +989367780472

Received: April 3, 2021 **Accepted:** June 18, 2021

Pericardial cysts are defined as benign mediastinal tumors diagnosed mostly incidentally, with a reported incidence rate of 1 in 100 000 people.[1,2] Most pericardial cysts are located in the right cardiophrenic space, with diameters ranging from 1 cm to 5 cm.[3]

We herein describe a 41-year-old woman with the hugest pericardial cyst ever seen, along with the uncommon clinical presentations.

Case Presentation

A 41-year-old woman weighing 50 kg was admitted to our emergency department (ED) with complaints of bilateral lower limb grade 2^{+} edema, exertional dyspnea, and recurrent palpitations. The patient was in Class III functional class. She had neither a history of hospitalization nor a family medical history of cardiac diseases. She reported a decreased level of consciousness after a sudden postural change position to

upright the night before the ED admission. She also reported sleep deprivation for approximately 2 months before the ED admission due to palpitations, alleviated through self-medication with oxazepam (10 mg every night). Furthermore, she reported having contracted COVID-19 infection 8 months before the ED admission, which was treated.

On admission, the patient was in stable condition and afebrile. She had a blood pressure of 100/79 mm Hg, a regular heart rate of 94 beats per minute, and a respiratory rate of 29 breaths per minute. Her oxygen saturation level at rest, measured with a finger pulse oximeter on the index finger, was 96%. In the primary physical examination, cardiac auscultation revealed a minimum grade 1/6 systolic murmur at the right and left sternal borders and a diastolic murmur like a tumor plop at the apex.

Electrocardiography demonstrated no signs of abnormal conductive pathways. The cardiac rhythm was sinus with a normal axis deviation.

Chest X-ray, in the posteroanterior view, revealed an increased cardiothoracic ratio, a normal aortic arch, a bulging main pulmonary artery, and increased right descending pulmonary artery thickness.

The patient was referred to the echocardiographic study unit, where transthoracic echocardiography showed a normal left ventricular ejection fraction (58%) and normal left-side chambers and valves. The right atrium was reduced in size due to a large cystic-like mass filled with porous media (12.5×7 cm) with a smooth surface at the supradiaphragmatic right paracardiac region with compressive effects on the right heart, especially the tricuspid valve annulus, without invasion to the cardiac chambers (Fig. 1). The right-side cardiac function was disturbed (tricuspid annular plane systolic excursion =0.83 cm) by this giant mass. The inferior vena cava was plethoric with reduced collapsibility.

Next, spiral thoracic computed tomography (CT) scan was performed, and the results showed a supradiaphragmatic and right paramediastinal cystic structure with an axial diameter of 14.9 cm and a craniocaudal diameter of 15.9 cm. The cystic structure appeared smooth and exhibited mild enhancement. There was no nodulation or calcification. Further, evaluation of the pulmonary parenchymal tissue indicated a relative increase in the asymmetrical density with a ground-glass view in the bilateral superior lobes. Moreover, atelectasis bands were detected in the right medial and superior lobes, the left lingula, and the inferior lobe.

Based on the findings, the patient was isolated, and a polymerase chain reaction COVID-19 test was administered. In this period, she was closely monitored. After the test returned negative, she was prepared for cardiothoracic surgery.

A median sternotomy was performed, and the intra-pericardial cystic tumor was found. This cystic mass was seen on the right side of the intrapericardial space, near the atrial side, but there was no connection with the cardiac chambers (Fig. 2). The mass was, then, gently dissected, and the vascular pedicles, located in the superior pole, were ligated. The mass was resected entirely without injury to the heart (Fig. 3) and was sent to the pathology department for specimen evaluation.

After the surgical operation, the patient was transferred to the cardiac surgery intensive care unit. When the weaning process from mechanical ventilation was completed, she was extubated.

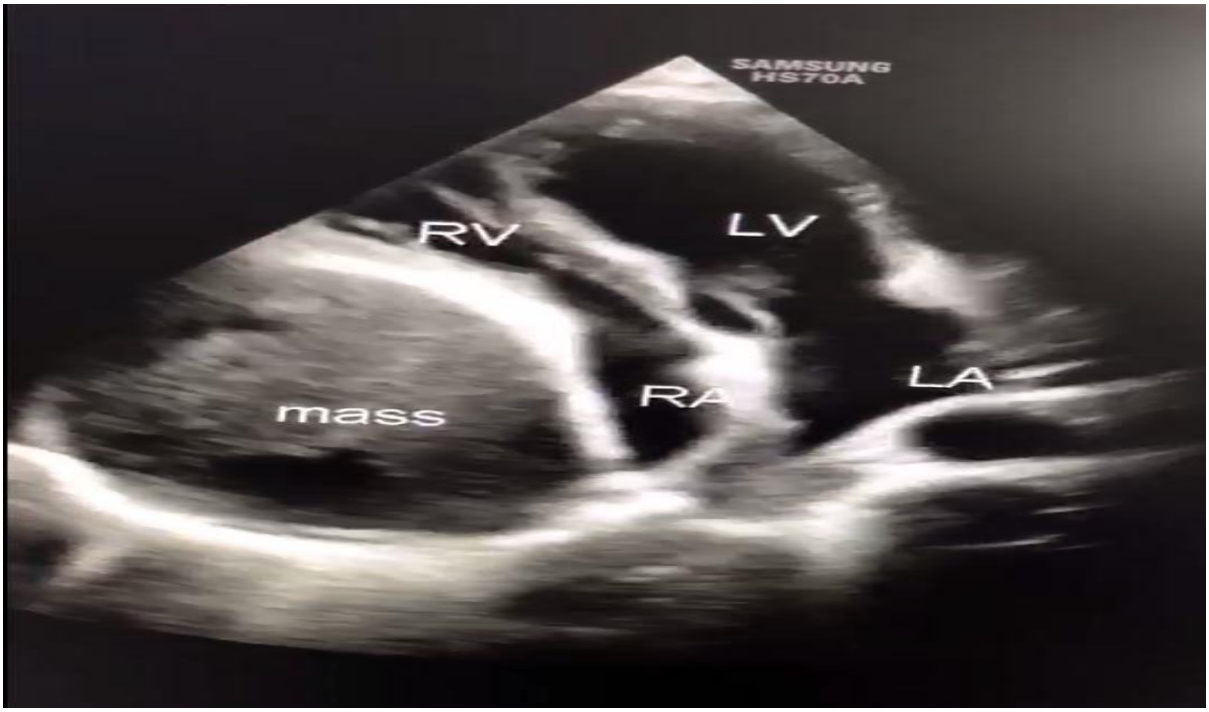

Figure 1: The apical 4-chamber view of transthoracic echocardiography reveals a supradiaphragmatic right paracardiac huge mass with compressive effects on the right side of the heart.

RV, Right ventricle; LV, Left ventricle; LA, Left atrium; RA, Right atrium

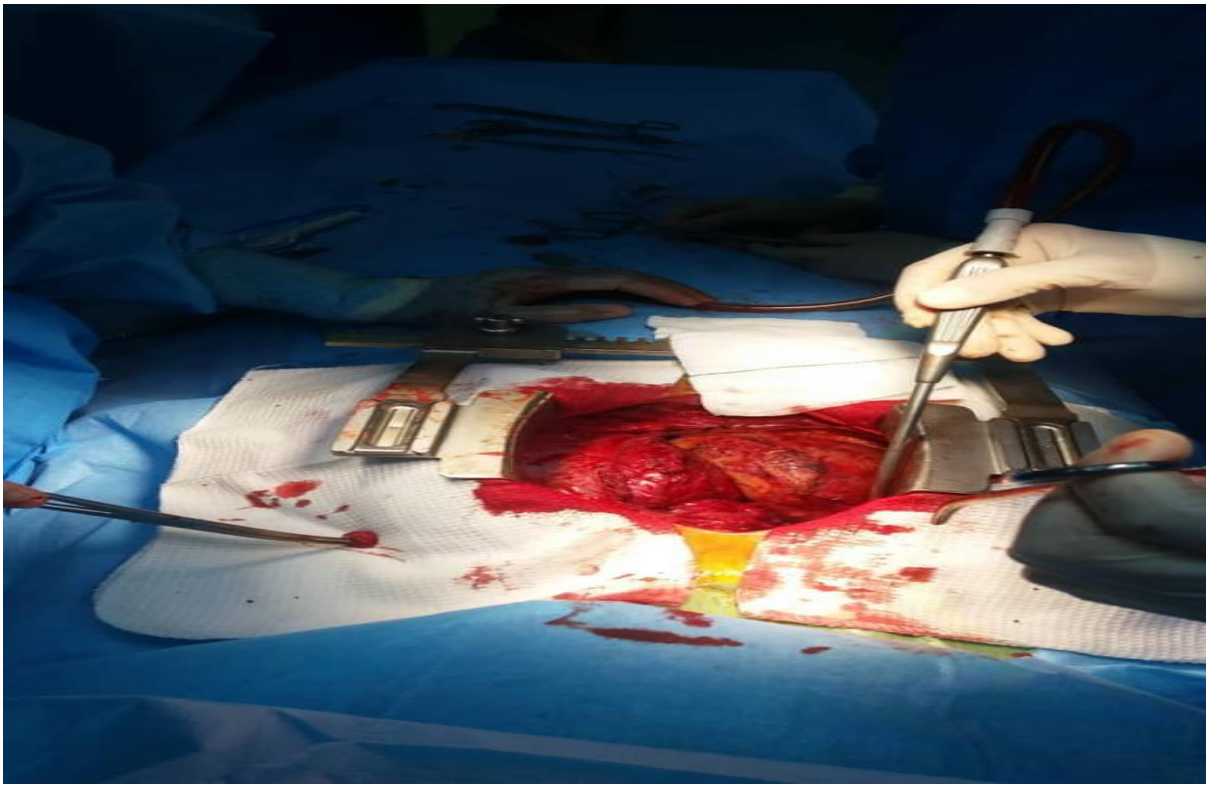

Figure 2: The image shows the huge paracardiac cyst after sternotomy. It extended from the superior vena cava to the inferior vena cava and in the margin of the right and left atria.

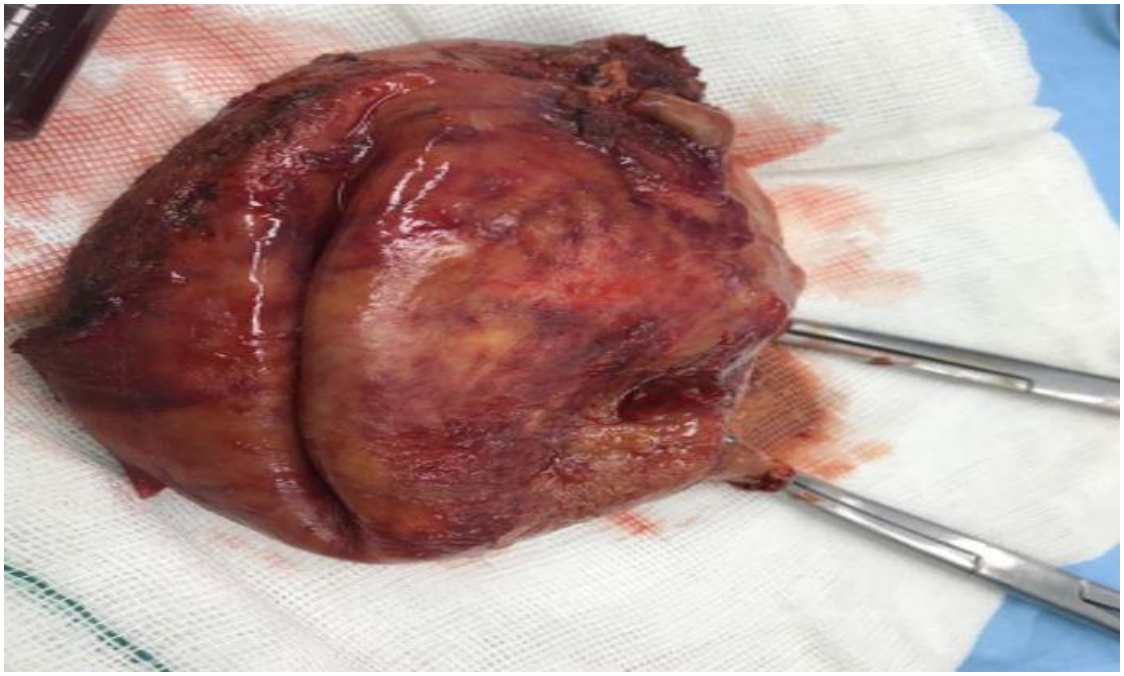

Figure 3: The image shows the completely dissected and resected huge pericardial mass.

The gross and microscopic examinations of the cystic mass revealed that it consisted of a huge cystic lesion filled with amorphous brown material and a thick wall 15×13.5×3.5 in size. The opening of the mass showed that the lumen was filled with amorphous materials. In addition, the inner surface was irregular, coarse, and yellowish-brown in color, and there were focal and hemorrhagic areas. The greatest wall thickness was 0.7 cm. The microscopic examination showed that the thick cystic wall, with a destructed epithelium, was composed of mixed chronic and acute inflammation, which was also affected by fibrosis, hemosiderosis, histiocytes, and proliferated endothelial cells with no granuloma or malignancy. Moreover, no mesothelial proliferation was found.

Two days after intensive care unit admission, the patient was transferred to the post-cardiac surgery care ward, and 1 day afterward, she was discharged from the hospital in good condition.

Twenty-one days after hospital discharge, the patient was followed up with transthoracic echocardiography, which revealed no significant findings, especially in the right side of the heart and the pericardium. We, therefore, advised the patient to visit the heart clinic every 6 months for a follow-up of her cardiac condition.

DISCUSSION

Pericardial cysts are uncommon congenital or acquired anomalies that may appear as an incidental paraclinical finding in asymptomatic patients.[4] Over two-thirds of pericardial cysts are right-sided and less frequently in the left cardiophrenic triangle, with diameters ranging between 1 cm and 5 cm,[5] albeit some studies have reported larger masses.[6,7]

Our patient's huge mass led to dangerous cardiac symptoms, for which she came to our ED. These symptoms caused syncope, a life-threatening complication, based on history taking. This symptom was rarely reported before our case.[8] Our patient also complained of dyspnea on exertion, which

may have been due to the huge pericardial cyst itself and its compressive effects on the right ventricle, compromising its function.[9]

Our patient's cyst was 15×13.5×3.5 cm in diameter, which makes it one of the largest cysts found in the literature to date. This size of a pericardial cyst is an extremely rare event, causing life-threatening cardiac complications such as syncope. Other complications due to pericardial cysts include chest pain, pericardial tamponade, dyspnea, atrial fibrillation, and heart failure.[10]

Palpitations have not been reported as a complication of pericardial masses. Still, this complication might have been secondary to the use of oxazepam as a hypnotic agent in our patient.[11] On the other hand, infection with COVID-19 could have affected our patient's pericardium.[12] Nevertheless, the presence of a pericardial mass concomitant with COVID-19 infection needs more investigation.

CT scan is considered the best modality and gold standard for the diagnosis as it provides an excellent explanation of the pericardial morphology.[6] The modality can aid in the accurate characterization of various pericardial lesions, such as pericardial thickening, pericardial masses, and congenital anomalies.[13] The final decision concerning the selection of the treatment procedure is made based on CT scan findings.

Our patient's pericardial cyst was excised surgically. Other procedures such as video-assisted thoracoscopic surgery and robotic surgery are associated with good outcomes.[14] However, in complicated pericardial cysts with suspicious diagnoses, as was the case in our patient, the surgical procedure is recommended.

CONCLUSIONS

Pericardial cysts can have various clinical presentations, ranging from asymptomatic to life-threatening complications. The case presented herein is a unique description of a patient with a giant pericardial cyst with deceptive and rapidly worsening symptoms, requiring a surgical approach. Therefore, in similar cases, a multidisciplinary approach with a precise diagnosis and an appropriate treatment modality could confer the best outcome.

REFERENCES

1. Elamin WF, Hannan K. Pericardial cyst: an unusual cause of pneumonia. Cases J. 2008; 1(1):26.

2. Maisch B, Seferovic PM, Ristic AD, Erbel R, Reinmuller R, Adler Y, Tomkowski WZ, Thiene G, Yacoub MH, Task Force on the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology. Guidelines on the diagnosis and management of pericardial diseases executive summary; The Task Force on the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology. Eur Heart J. 2004; 25:587–610.Kar SK, Ganguly T. Current concepts of diagnosis and management of pericardial cysts. Indian Heart J. 2017; 69(3):364-370.

3. Varvarousis D, Tampakis K, Dremetsikas K, Konstantinedes P, Mantas I. Pericardial cyst: An unusual cause of chest pain. J Cardiol Cases. 2015; 12(4):130-132.

4. Kar SK, Ganguly T. Current concepts of diagnosis and management of pericardial cysts. Indian Heart J. 2017; 69(3):364-370.

5. Arvarousis D, Tampakis K, Dremetsikas K, Konstantinedes P, Mantas I. Pericardial cyst: An unusual cause of chest pain. J Cardiol Cases. 2015; 12(4):130-132.

6. Patel J, Park C, Michaels J, Rosen S, Kort S. Pericardial cyst: case reports and a literature review. Echocardiography. 2004; 21:269–72.

7. Najib MQ, Chaliki HP, Raizada A, Ganji JL, Panse PM, Click RL. Symptomatic

pericardial cyst: a case series. Eur J Echocardiogr 2011; 12:E43.

8. Ilhan E, Altin F, Ugur O, Özkara S, Kayacioglu I, Aydemir NA, Tayyareci G. An unusual presentation of pericardial cyst: recurrent syncope in a young patient. Cardiol J. 2012; 19(2):188-91.

9. Ghasemi R, Ghanei-Motlagh F, Nazari S, Yaghubi M. Huge mass in right side of the heart: A rare case report. ARYA Atheroscler. 2016; 12(6):291-294.

10. Sokouti M, Halimi M, Golzari SE. Pericardial cyst presented as chronic cough: a rare case report. Tanaffos. 2012; 11(4):60-2.

11. Seyed Sharifi SH, Mohammad Rezapour T, Yaghubi M. Abrupt Palpitation Following Taking Regular Doses of Oxazepam: A Rare Case Report. Thrita. 2015; 4(4):e23041.

12. Amoozgar B, Kaushal V, Mubashar U, Sen S, Yousaf S, Yotsuya M. Symptomatic pericardial effusion in the setting of asymptomatic COVID-19 infection: A case report. Medicine 2020; 99:37(e22093).

13. Wang ZJ, Reddy GP, Gotway MB, Yeh BM, Hetts SW, Higgins CB. CT and MR imaging of pericardial disease. Radiographics. 2003; 23 Spec No: S167-80.

14. Bacchetta MD, Korst RJ, Altorki NK, Port JL, Isom OW, Mack CA. Resection of a symptomatic pericardial cyst using the computer-enhanced da Vinci Surgical System. Ann Thorac Surg. 2003; 75 (6): 1953- 5.