

Secondary Chylopericardium Complicated with Cardiac Tamponade in A Drug Addict : A Case Report

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Abstract

We report a case of intravenous drug abuse. He left the hospital without the permission of a doctor and had a retained central venous catheter in right internal jugular vein 4 weeks prior to this admission. At home he performed intravenous injection of drugs by himself via the central venous catheter or sometimes via left subclavian vein approach. The patient presented with chylopericardium and chylothorax which possibly resulted from the impairment of lymphatic drainage or injury of the thoracic duct and/or other lymphatic duct after long term self injection through the right internal jugular vein and left subclavian vein, thrombosis developed in these vessels. Cardiac tamponade was the initial manifestation which was well-managed by emergency pericardiocentesis. Persistent bilateral chylothorax was initially refractory to combined therapy with anticoagulant therapy, dietary control as well as total parenteral nutrition. Then it was treated successfully with surgical ligation of the thoracic duct. There was no recurrence on follow-up. (J Intern Med Taiwan 2004; 15: 214-218)

Key Words : Chylopericardium, Cardiac Tamponade, Echocardiography, Pericardiocentesis

Introduction

Chylopericardium, characterized by the accumulation of chylous fluid in the pericardial sac, is a rare clinical entity. It may derive from extravasation of chyle from the lymphatic duct into pericardial space owing to a neoplasm or abnormal communication between pericardium and thoracic duct¹. Primary (or idiopathic) chylopericardium denotes an unknown cause¹. Secondary chylopericardium usually results from the injury of thoracic duct by chest trauma or surgery², subclavian vein thrombosis³, radiotherapy, infection or malignancy⁴. Cardiac tamponade may occur if the accumulation of chyle in pericardial space causes the intrapericardial pressure to be higher than the intracardiac pressure. Here, we presented a case of secondary chylopericardium with cardiac tamponade.

Case Report

This 39-year-old male patient came to our emergency room on account of progressive dyspnea on exertion and abdominal fullness for 2 weeks. He had been a user of intravenous illegal drugs for several

years. Four weeks prior to this admission, he escaped from another hospital with a central venous line on right internal jugular vein. He used the central venous catheter for intravenous drug administration. On admission, his blood pressure was 86/48 mmHg, heart rate was 112 beat per minute, respiration rate was 30 per minute and body temperature was 36.0 °C. The consciousness was alert. The jugular venous pressure was elevated and estimated to be 24 cm H₂O, and there was no Kussmaul's sign. There was pulsus paradoxus that was estimated to be 15 mmHg. Physical examination disclosed moist rales over bilateral lower lung fields. Distant heart sounds were noted by cardiac auscultation. Hepatomegaly and both legs pitting edema were found. In addition, pus over the puncture site of the central venous line was found and tip culture was done after the removal of central venous catheter. There were multiple puncture wounds on the right neck and left subclavicular area.

His initial blood test yielded a hemoglobin of 13.7 g/dL, white blood cell count 7700/ μ L, platelets 427000/ μ L, blood urea nitrogen 31.2 mg/dL, creatinine 1.15 mg/dL, sodium 131.2 mEq/L and potassium 3.6 mEq/L.

The ECG showed sinus tachycardia and low QRS voltage. A chest roentgenogram revealed bilateral pleural effusion and cardiomegaly. Cardiac tamponade was proved by an emergency echocardiography. It revealed massive pericardial effusion with cardiac swing and diastolic collapse of right ventricular free wall which was compatible with cardiac tamponade (Fig. 1) .

Emergent pericardiocentesis was performed under echo-guide. 280 mL of milky fluid was drained and hemodynamics improved soon. The pericardial fluid was examined, and it showed a PH 7.8, RBC 9500 cell/ μ L , WBC 1526 cell/ μ L (95% lymphocytes) , cholesterol content 57 mg/dL, triglyceride content 807 mg/dL (the serum triglyceride content 76 mg/dL) and glucose level 90 mg/dL. There were microscopic fat droplets. A cytology study of the pericardial fluid showed normal findings; cultures were negative for bacteria, fungi, and mycobacterium. Pleurocentesis yielded the similar result.

Unfortunately, patient still had dyspnea on mild exertion after adequate pericardial drainage. The bilateral pleural effusion increased day by day on daily chest X-ray follow-up. The pericardial effusion was unremarkable on follow-up echocardiography. Repeated drainage of both sides pleural effusion was performed for recurrence. Large amount of chylous fluid was drained. Dyspnea subsided temporally after each drainage.

Contrast chest computed tomography (CT) was done for the recurrent chylothorax. There was extensive thrombosis of the right internal jugular vein (Fig. 2) and bilateral brachiocephalic veins and it extended to a part of superior vena cava (SVC). Anticoagulant therapy with heparin and warfarin was used to treat the catheter-related venous thrombosis.

The chylothorax was managed by NPO and total parenteral nutrition support in addition for about 32 days; however, the daily drainage of the pleural effusion at each side was more than 300 mL. In the meantime, repeat echocardiography revealed only small amount of pericardial effusion.

The lymphangiography was suggested but the patient declined. Finally, the patient received surgical ligation of the thoracic duct through a right open thoracotomy for refractory bilateral chylothorax. The postoperative improvement was satisfactory. The patient was discharged when the condition became stable. There was no recurrence on follow-up.

Discussion

Secondary chylopericardium usually results from injury to or disease affecting the thoracic duct. The previously reported causes include: chest trauma or surgery 2, subclavian vein thrombosis 3, radiotherapy, infection and malignancy 4.

The fluid from pericardial and pleural space was defined as chyle by the milky white appearance, presence of microscopic fat droplets and the lymphocyte predominance in the white cell count. Chan et al. reported a case of intravenous drug addict who presented with chylopericardium and pulmonary edema 5. Our patient had no clinical evidence of infection or malignancy. To our knowledge, this is the first report of patient with drug addict who presented with chylopericardium, cardiac tamponade, and chylothorax at the same time.

Lymphatic drainage of lungs originates in superficial and deep plexuses; The former drain into the bronchopulmonary nodes followed by bronchomediastinal lymph trunks, and the latter drain into pulmonary nodes, then into bronchopulmonary nodes and bronchomediastinal lymph trunks. Both lymph trunks on either side conveyed directly into the brachiocephalic vein or indirectly via thoracic duct or right thoracic duct 6. The lymphatic vessels of the heart have three plexuses, which locate in the endocardium, myocardium and epicardium respectively. Lymph drainage is from subendocardial lymphatic vessels toward subepicardial lymphatic ones 7. The subepicardial plexus form right and left collecting lymphatic trunks, which in turn drain into right lymphatic duct and thoracic duct. The thrombosis of right internal jugular vein, right brachiocephalic vein with part of the SVC thrombosis in this patient may account for the lymphatic leak which caused the impairment of lymph drainage into right brachiocephalic vein by way of right lymphatic duct; the etiology of the thrombosis may be partly caused by previous indwelling right central venous catheter. Frequent injection on left subclavian vein, probably causing thrombosis of left brachiocephalic vein, may culminate in the abnormality of lymphatic drainage from thoracic duct, thus induced the occurrence of chylopericardium and refractory chylothorax. Thoracic duct, collecting all lymph from the lower limbs, pelvic and abdominal cavity, left side of the thorax, left side of the head, neck and left upper limb; however, right lymphatic duct only received lymph from the right side of the head, neck, thorax and right upper limb. Thus, the lymphatic drainage of thoracic duct exerted more influence on lymphatic leak than the right lymphatic duct. Therefore, the abnormalities in anastomotic connections between lymphatic vessels and pleural or pericardial sac may be the most possible cause of concomitant chylothorax and chylopericardium in this patient.

Enhanced CT with lymphangiography is a very reliable diagnostic tool for identifying abnormalities of the thoracic duct and its lymphatic channels connecting to the pericardium, pleura and fistula 8.

Conservative management includes pericardial drainage, pleurocentesis and a low-fat diet with increased medium-chain triglycerides 4. Chylothorax is a challenging clinical problem. If left untreated, it carries a high mortality and morbidity. There is no agreement about the amount of daily drainage of the chyle that indicates the need for surgical intervention, but a large uncontrollable effusion after the conservative treatment may necessitate ligation of the thoracic duct 9. Traditional surgical management for cases refractory to conservative treatment is thoracic duct ligation through right open thoracotomy.

Thoracoscopic direct clipping of the thoracic duct by video-assisted thoracic surgery without a thoracotomy is an effective and an alternative way of treating chylopericardium and refractory chylothorax and carries minimal morbidity 10.

Summary

This is a drug-addict patient, presenting with chylopericardium, cardiac tamponade and refractory chylothorax. Such case has never been reported previously. Injection of the drugs via central veins and prolonged retention of central venous catheter caused the thrombosis of right internal jugular vein, right brachiocephalic vein and a part of SVC. The leakage of lymphatic channels resulted in chylothorax, chylopericardium and cardiac tamponade. The patient underwent all possible therapeutic managements

including dietary medium-chain triglycerides, total parenteral nutrition, pleurocentesis, pericardial drainage and finally thoracotomy with a successful thoracic duct ligation which had a good control of the chylopericardium and chylothorax.

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Fig.1. Transthoracic echocardiography, parasternal long axis view, showing massive pericardial effusion, and right ventricular diastolic collapse (as noted by an arrowhead). RV, right ventricle; LV, left ventricle; LA, left atrium; Ao, aorta; RVDC, right ventricular diastolic collapse; PE, pericardial effusion

Fig.2. Chest computed tomography showed bilateral massive pleural effusion and extensive thrombosis of the right internal jugular vein (as noted by an arrowhead).

施打毒品者續發性乳糜性心包膜液併發心包膜填塞：一病例報告

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摘 要

我們報告的這個個案是一位 39 歲施打毒品的男性，入院主述這 2 個星期運動時愈來愈喘，時有腹脹的情形。經檢查發現有乳糜性心包膜液併發心包膜填塞及兩側乳糜胸，有右側內頸靜脈栓塞，雙側頭臂靜脈及部分上腔靜脈栓塞，經緊急施行心包膜穿刺術及胸膜穿刺術後，病人情況有改善，

但是兩側乳糜胸經抗凝血劑等內科治療未見改善，最後採用外科手術結紮胸管。因這樣的病例臨床上並不常見，所以提出個案報告。