Case Report

Isolated Chylopericardium After Cardiac Surgery

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Chylopericardium is a rare complication of cardiac surgery. It may be caused by a lesion in the thoracic duct or its tributaries or by thrombosis in the confluence of the jugular and left subclavian veins, obstructing the drainage of the thoracic duct. The treatment may be conservative or surgical, depending on the duration and on the volume of the effusion. We report the case of a 24-year-old female, who, in the late postoperative period of mitral valve replacement (bioprosthesis), was hospitalized with cardiac tamponade due to the presence of chylopericardium. The clinical findings and treatment performed are discussed.

The accumulation of chylous fluid in the pericardial space was first described by Hasebrock in 1888 [1]. In 1935, Yater, reviewing 100 cases of nontraumatic chylothorax, found 3 cases of chylopericardium [2]. In 1971, Thomas and McGoon reported the first case of chylopericardium following cardiac surgery [3].

Chylopericardium has been estimated to represent 0.0004 to 0.15% of the complications of cardiac surgery [1,4]. By 1985, 13 cases had been reported since the first communication by Thomas and McGoon, with a mortality rate of 15.4%, and only 1 case occurring after aortic valve replacement. On that occasion, Grinberg et al [4] reported the first Brazilian case after mitral valve replacement.

The treatment may be surgical or conservative, depending on the volume and duration of the effusion. The conservative treatment consists of pericardial drainage associated with a medium-chain-triglyceride-enriched diet (MCT), and the surgical treatment consists of ligature of the thoracic duct through surgical exploration or thoracoscopy [5] and partial pericardiectomy [1].

Ours is the second case reported in the medical literature about chylopericardium after mitral valve replacement, and it was conservatively and successfully managed.

Case report

We report the case of a 24-year-old female patient refered to the Instituto de Cardiologia of the Rio Grande do Sul of the Fundação Universitária de Cardiologia of the Rio Grande do Sul in October 2001 after drainage of an intracerebral hematoma. The patient had been diagnosed with staphylococcal endocarditis in a rheumatic mitral valve, mitral valve dysfunction, and congestive heart failure. The patient underwent mitral valve replacement (bioprosthesis) with a good evolution in the postoperative period and during the treatment for endocarditis.

In February 2002, the patient returned to the emergency department of the Instituto de Cardiologia with clinical findings of cardiac tamponade, showing an enlarged cardiac area on a chest radiogram (fig. 1), and voluminous pericardial effusion on a transthoracic echocardiogram (fig. 2). Pericardial drainage was performed with removal of 800 mL of milky pericardial fluid. The biochemical analysis of the pericardial fluid evidenced the following: cholesterol of 98 mg/dL; triglycerides of 1017 mg/dL; and the presence of chylomicrons. The cytopathologic examination was negative for malignant cells.

The diagnosis of chylopericardium was established, and a hypolipidic MCT diet was instituted in association with serial echocardiographic follow-up. On the 11th day, the pericardial effusion resumed, and pericardial drainage was again performed with maintenance of the drain. Orally ingested food was suspended, and total parenteral nutrition was initiated.

Pericardial fluid production ceased after 12 days, allowing the removal of the drain and reinitiation of an oral diet with MCT for 6 more days. The patient was discharged on the 31st day of hospitalization with resolution of the clinical findings.

Discussion

Lymph is composed of a material rich in proteins and fat, which is conducted from the periphery of the tissues and intestine to the vascular system, initially inside small canaliculi, and then to the cisterna magna and thoracic duct[6-8]. All lymph in the body follows this trajectory, reaching the innominate vein near the point where the internal jugular vein arrives. Lymph originating from the right half of the head and right upper limb drains into an accessory duct, to the right, in the superior vena cava. Approximately 1.5 to 2.0 liters of lymph flow daily inside the thoracic duct and discharge into the superior vena cava [6-8]. When the lipid and protein contents of lymph are increased, it is called chyle, and when this occurs, the total volume is increased [6-8].

Chylopericardium may result from trauma, pancreatitis, thoracic surgery, congenital lymphangiomatosis, or may be secondary to obstructions in the thoracic duct or in the drainage of the left subclavian vein due to neoplasias and tuberculosis. Chylopericardium may even be associated with congenital syndromes, such as Noonan's syndrome [8,9].

The physiopathology of the accumulation of chyle in the peri-

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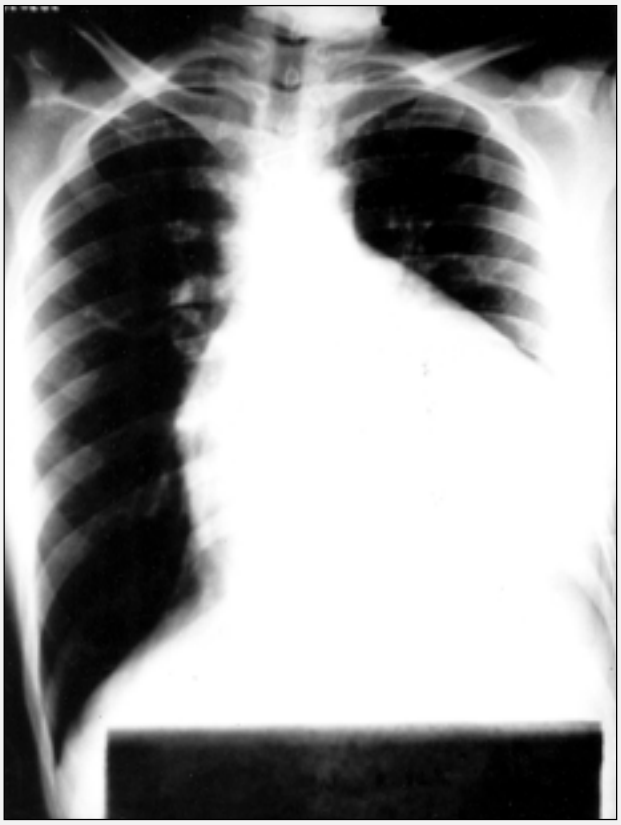

Fig. 1 - Chest radiogram showing enlargement of the cardiac area.

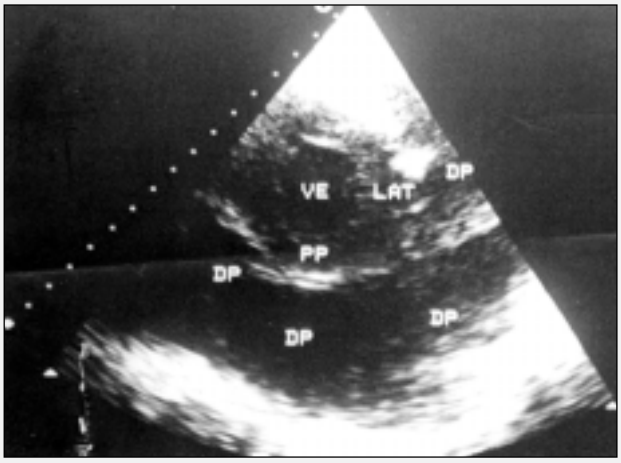

Fig. 2 - Transthoracic echocardiogram showing great pericardial effusion. DP - pericardial effusion; LAT - lateral wall; PP - posterior wall; VE - left ventricle.

cardial space may result from one of the following: a direct lymphopericardial communication in the presence of fistulas; reflux of chyle due to lymphatic hypertension, causing loss of valvular function with failure in establishing collateral lymphatic drainage; or secondary to an increase in the permeability of the walls of the lymphatic vessels [1,8,10].

Chylopericardium may have 2 clinical expressions. The first, less frequent (30.8%) and more precocious, appears a few (24 to 98) hours after surgery, being noticed by the flow of an initially serous, and then milky fluid through the still present thoracic drain. The second, more common (69.2%) and later (mean of 25 days), manifests, as in our patient, as cardiac tamponade after a subclinical period of accumulation of chyle in the pericardium. Dyspnea, cyanosis, hypophonesis of the cardiac sounds, painful hepatomegaly, and severe edema in lower limbs characterize the syndrome of diastolic restriction [1,4,11].

Lymphangiography, in cases of postoperative chylopericardium, is not recommended, because it is not essential for the diagnosis and the possible localization of the fistula does not change the treatment [1,11].

Regarding the therapy for chylopericardium, when it is identified in an asymptomatic patient, observation and clinical management may be sufficient [12]. If the pericardial effusion increases, which may be evidenced on serial echocardiograms, or if cardiorespiratory impairment develops, diagnostic and therapeutic pericardiocentesis should be performed in the traditional manner or through videopericardioscopy [13]. In addition, a hypolipidic MCT diet should be instituted [12,14] with the outcome being a reduction in the formation of lymph. The absorption of MCT is performed through the portal vein, differently from that of long-chain triglycerides, which undergo a process of esterification and formation of chylomicrons, which are absorbed by lymphatic means. This should reduce the formation of lymph and the effusion tends to disappear [4,6,8,12]. In the case reported, diagnostic and therapeutic pericardiocentesis was performed and an MCT-enriched diet was instituted, but the symptoms and pericardial effusion recurred in 10 days.

Another therapeutic option when symptoms recur is pericardial drainage associated with fasting and prolonged parenteral nutrition [4,6,8,11]. In refractory cases, exploratory thoracotomy or thoracoscopy [5] has been indicated, with ligature of the thoracic duct above the diaphragm, associated with partial pericardiectomy. Pericardiectomy has been used to perform complete drainage and to avoid the evolution to constrictive pericarditis [8,15]. In the present case, subxiphoid pericardial drainage was performed and total parenteral nutrition was instituted with cessation of the pericardial drainage on the 12th day, and removal of the drain on the 14th day. The MCT-enriched diet was maintained exclusively for 6 more days, with a good hospital evolution.

Pollard et al [1] reported 4 cases of isolated chylopericardium after cardiac surgery. The first patient was a 23-year-old male in the postoperative period of myotomy and myectomy due to hypertrophic cardiomyopathy with an increase in mediastinal drainage after an unrestricted diet was initiated (3rd postoperative day); then, the patient underwent surgical reintervention and ligature of the thoracic duct. The second patient was a 4-year-old child in the postoperative period of pulmonary valvotomy due to pulmonary stenosis with clinical findings of cardiac tamponade on the 10th postoperative day, who underwent pericardial drainage and a MCT diet, which resolved the problem. The third patient was a 57-year-old man in the postoperative period of myocardial revascularization with persistent drainage after institution of an unrestricted diet, who was treated with a hypolipidic diet, which resolved the problem after 8 days. The fourth patient was a 22-year-old male who underwent correction of an interventricular septal defect with an increase in drainage after institution of an unrestricted diet; then, a hypolipemic diet was instituted, followed by total parenteral nutrition, without success. The patient then underwent ligature of the thoracic duct.

Pereira et al [14] reported the case of a 4-year-old female child with cardiac tamponade on the 6th postoperative day of correction of an interatrial septal defect due to the presence of chylopericar-

dium. The patient underwent early surgical exploration to reduce the risk of malnutrition.

Grinberg et al [4] reported the first case of chylopericardium after mitral valve replacement treated with pericardiostomy and MCT, which eliminated the need for pericardial drainage after 35 days.

Nguyen et al [16] reported their 10-year experience in the treatment of chylopericardium/chylothorax after cardiac surgery in children, stressing that 84% of the cases were successfully treated with a hypolipidic diet or total parenteral nutrition, and a mean of 15.7 days were necessary for the drainage to cease.

In conclusion, chylopericardium is a rare complication of mitral valve replacement that can be clinically managed with success.

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