Treatment of a Persistent Postoperative Chylothorax With Somatostatin

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Chylothorax is a rare but potentially serious complication of pediatric cardiac operations. We report the case of a 4-month-old boy who underwent a Senning procedure for correction of D-transposition of the great vessels. A persistent postoperative chylothorax developed, necessitating continuous drainage, despite conservative treatment over 3 weeks. Thereafter, continuous somatostatin infusion for 14 days led to the reduction and finally cessation of chyle production. This treatment allowed early enteral feeding and avoided further surgical intervention.

(Ann Thorac Surg 1998;66:253–4)

Chylothorax is a rare but potentially serious complication of pediatric cardiac operations, with an incidence of around 1% [1]. Conservative therapy with the use of a low-fat diet containing medium-chain triglycerides or total parenteral nutrition, combined with pleural drainage, is often effective. Operation is advocated after 3 to 4 weeks of unsuccessful nonoperative treatment [2]. Different surgical methods have been described (eg, ligation of the thoracic duct, pleuroperitoneal shunt, pleurodesis), but the results are not always very satisfactory [2–4].

A 4-month-old boy (weight, 5 kg) underwent the atrial switch procedure for correction of D-transposition of the great vessels. The early postoperative course was uneventful with normal hemodynamic measurements. However, on day 2 postoperatively hemodynamics became unstable with increasing central venous and left atrial pressure, lower mean arterial pressures, and decreasing diuresis. Chest radiography revealed bilateral pleural effusions, despite chest and pericardial drains in place. Echocardiography showed an important pericardial effusion, a mildly decreased systemic ventricular function, and a gradient of 5 mm Hg at the junction of the superior vena cava with the systemic atrium. Chest and pericardial drains were replaced surgically. Analysis of drainage fluid showed increased cellularity with a predominance of lymphocytic cells (>70%); Sudan III staining was positive. The diagnosis of a bilateral chylothorax and chylopericardium was confirmed.

Accepted for publication Jan 31, 1998.

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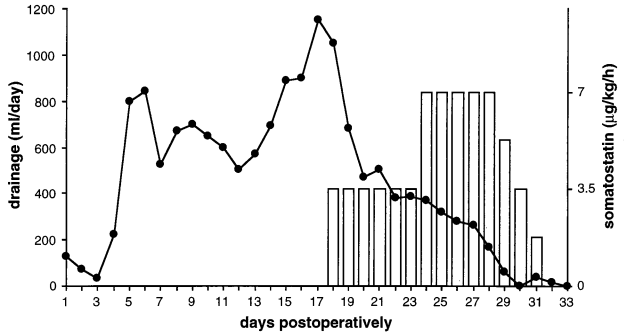

*Fig 1. Total drainage from chest and pericardial drains (*closed circles*) and doses of somatostatin given by continuous infusion (*open bars*).*

Total parenteral nutrition was started. Drainage decreased over the first few days (minimum, 500 mL/24 h) but increased again to reach a maximum of 1,150 mL/24 h (230 mL · kg^{-1} · 24 h^{-1}) on day 17 (Fig 1). Volume and electrolyte homeostasis was maintained and losses of proteins, coagulation factors, and immunoglobulins were replaced regularly. On day 17 echocardiography showed absence of superior vena cava or innominate vein thrombosis and absence of stenosis of superior vena cava–systemic atrium junction.

In the presence of increasing drain losses under conservative treatment, we decided to attempt reduction of lymph production with somatostatin as a continuous infusion (3.5 $\mu g \cdot kg^{-1} \cdot h^{-1}$) before considering ligation of the thoracic duct. Within the next 24 hours drainage was reduced drastically; it decreased further over the next 4 days, and remained stable at 380 mL/24 h (see Fig 1). The somatostatin dose was doubled (7 $\mu g \cdot kg^{-1} \cdot h^{-1}$) to attempt further reduction. When drainage was less then 5 mL · kg^{-1} · day^{-1}, somatostatin administration was withdrawn over 4 days. No side effects such as hypotension or hyperglycemia were observed during the whole treatment. Enteral nutrition with a medium-chain triglyceride diet was introduced 1 day later, and chest drains were removed 5 days later. The boy was discharged from the hospital on day 46 postoperatively and kept on the medium-chain triglyceride diet for only another 3 weeks. He showed no recurrence of pleural effusions.

Comment

Chylothorax is a rare, but serious complication of cardiovascular operations for congenital heart disease. A conservative treatment strategy is currently recommended to avoid unnecessary early operation [2]. However, patients may present with massive lymph drainage, which will induce critical losses of fluid, lymphocytes, proteins, coagulation factors, and antibodies, thus increasing morbidity and mortality [1]. This is particularly true in small babies, for whom early operation is advocated [3]. Somatostatin reduces gastric, pancreatic, and intestinal secretions [5]. Somatostatin also causes a decrease of hepatic venous pressure gradient and a mild but sustained decrease of splanchnic blood flow without influencing systemic hemodynamics [5–7]. These could be useful in an

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0003-4975/98/$19.00
PII S0003-4975(98)00361-0

attempt to decrease chyle production, as reported by Ulibarry and associates [8] in an adult patient. We obtained a similar result in an infant, in whom the introduction of somatostatin resulted in an immediate effect on chyle production, without any side effects, and operation was avoided. Controlled studies are required to confirm these observations and the effects of somatostatin treatment on morbidity and mortality.

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Left Atrial Reduction for Chronic Atrial Fibrillation Associated With Mitral Valve Disease

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Currently available surgical procedures to control chronic atrial fibrillation associated with mitral valvar disease are not always successful. The size of the left atrium is a major factor in the initiation and maintenance of atrial fibrillation. Here we describe a case of ablation of atrial fibrillation with left atrial reduction and pulmonary vein isolation in a patient with mitral valve disease.

(Ann Thorac Surg 1998;66:254–6)

Accepted for publication Jan 14, 1998.

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Atrial fibrillation (AF) is commonly encountered in patients with mitral valve disease, especially when the left atrium is enlarged. This rhythm increases the risk of thromboembolism and reduces cardiac performance. After a mitral valve operation, the majority of patients continue to have AF, and various surgical procedures have been described including the maze procedure [1], corridor procedure [2], atrial compartment operation [3], and left atrial isolation [4]. The factors found to be important include the number of wavelets, surface area of tissue, and intraatrial volume and pressure. The electroanatomic circumstances of valvar AF are different than those of idiopathic AF. The left atrium is the major chamber affected in patients with valvar AF. Thus we describe a case of successful ablation of AF with left atrial volume reduction, pulmonary vein isolation, and removal of the left atrial appendage in a patient who underwent mitral valve replacement and coronary artery bypass grafting.

A 73-year-old woman with mitral regurgitation was admitted for mitral valve replacement. She had breathlessness on exertion and had been known to be in AF for 19 years, and chronic palpitations was a major concern. Two-dimensional echocardiography showed moderately severe mitral incompetence with a giant left atrium 69 mm in diameter. Coronary angiography revealed a significant lesion in the left anterior descending artery. Informed consent was obtained and operation was undertaken in November 1996.

Cardiopulmonary bypass was established with cannulation of the aorta and inferior vena cava, and a right-angled cannula was placed in the superior vena cava above the pericardial reflection so that there was sufficient length of superior vena cava above its junction with the right atrium to be divided. Both antegrade and retrograde cardioplegic catheters were placed. The interatrial sulcus was developed over about 1 cm. Initial incision was made anterior to the right pulmonary veins. After the superior vena cava was divided and the aorta and pulmonary artery were retracted superiorly and to the left with an umbilical tape, the incision was carried superiorly over the dome of the left atrium (Fig 1). The complete transection of the left atrium was carried out by continuing this incision immediately anterior to the left pulmonary veins. Excellent exposure to the mitral valve was obtained by rotating the left atrium into the operative field.

The mitral valve was replaced with a 27-mm St. Jude Medical (St. Paul, MN) prosthesis, preserving the posterior leaflet. An equatorial rim of left atrial wall, including the left atrial appendage was then excised (Fig 2). Care was taken immediately posterior to the aorta to leave sufficient left atrial wall to preserve the occasional blood supply from the left coronary artery to the sinoatrial node and also to preserve Bachman's bundle. In removing the left atrial appendage, care was taken not to encroach too close to the atrioventricular groove, thus avoiding the circumflex coronary artery. The position of the coronary sinus was confirmed by the presence of the retrograde

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PII S0003-4975(98)00281-1