Chylopericardium After Mitral Valve Repair for Rheumatic Valve Disease Treated with Surgery

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ABSTRACT

Chylopericardium is a rare disorder that may be primary (idiopathic) or secondary to injury of the thoracic duct or thymus gland. Pediatric cardiac operations are more commonly related to this complication because thymus gland is very active in this population and atrophies in the adult patients. We present a case of chylopericardium after mitral valve repair for rheumatic disease, due to thymus gland tributaries injury.

Key words: Rheumatic valve disease, mitral valve, chylopericardium.

1. INTRODUCTION

Incidence of chylopericardium after cardiac surgery is very low and varies from 0.2% to 1.0% (1). A recent review of the past decade identified 33 patients with chylopericardium, few of them after cardiac surgery (2, 3, 4).

Thomas and McGoon (2) reported the first case of chylous pericardial effusion after cardiac surgery. There have been case reports of chylous pericardial effusion after mitral valve replacement from Grinberg and colleagues (3) and also after minimally invasive mitral valve repair for degenerative disease (5, 6, 7). We would like to describe one of the first cases of chylous pericardial effusion after mitral valve repair for rheumatic valve disease at our institution.

2. CASE PRESENTATION

A 40 year old woman presented at our clinic with severe mitral valve rheumatic stenosis. Intraoperative findings showed a typical rheumatic disease with commissural fusion and thickened valve leaflets, but a relatively preserved mitral valve apparatus.

We performed a mitral valve repair consisting of bilateral commissurotomy papillary muscle splitting and placement of a rigid anuloplasty ring (SEGUIN, St. Jude Medical) N. 30. Intraoperative echocardiography showed a good performance of the valve. No stenosis and regurgitation were detected. The postoperative period was uneventful and the patient was discharged on the 7th postoperative day in good conditions. No signs of pericardial effusion were noted on echocardiography.

The patient was readmitted at our institution a week after on an emergency basis with clinical signs of cardiac tamponade. After confirmation by echocardiography of

the presence of massive pericardial effusion, a central venous 18 F catheter was placed in the pericardial space. An amount of 1300 milky fluid was drained gradually and the patient get better. The pericardial fluid laboratory analysis showed chylomicrons and elevated triglycerides. Lymphocytes were seen on microscopy. The diagnosis of chylopericardium was obvious. Microbiology studies were negative. Parenteral nutrition was initiated and oral nutrition was stopped. Somatostatin 0,6 mg three times a day and antibiotic prophylaxis was constituted. The patient was treated conservatively for 30 days.

The average daily drainage was 75 ml but it did not decrease and stop during this period. Under these circumstances and taking in consideration the prevention of other complications we decided to reexplore the patient in sternotomy in an attempt to find the place of the leakage and close it. The patient was given to eat fat 12 hours before surgery and on the operating room by gastric tube.

Figure 1. Macroscopic view during surgery

Figure 2. Microscopic view of the liquid

No place leakage was observed. We ligated and sutured thymus gland remnants and the pericardial edges with double suture prolene 4/0. Additionally Bioglue (Bio Glue Surgical Adhesive, Cryolife) was placed over the sutured tissues to increase the possibility of closing the point of leakage. The right pleural space was opened for drainage and the patient was closed in the standard manner.

The postoperative period was without any complications. The drain tubes were taken off three days after with no signs of chyle leakage. Oral nutrition was normally commenced. On echocardiography there was no pericardial or pleural fluid 10 days after the intervention on discharge of the patient and 25 days later on control.

3. DISCUSSION

Chylopericardium is a rare disorder that may be primary (idiopathic) or secondary to injury of the thoracic duct or thymus gland. Pediatric cardiac operations are more commonly related to this complication because thymus gland is very active in this population and atrophies in the adult patients.

The thoracic duct carries chyle from the intestinal tract to the bloodstream and usually extends from the cisterna chyli, which lies just anterior to the first or second lumbar vertebra and passes through the aortic hiatus of the diaphragm. The thoracic duct continues cephalad in the right thorax between the aorta and the azygos vein until the fifth thoracic vertebra where it crosses over the vertebral column behind the esophagus and continuing into the left posterior mediastinum. The thoracic duct passes behind the aortic arch, along the left border of the esophagus, and behind the left subclavian artery over which it arches in the anterolateral aspect of the superior mediastinum. Then it descends to empty into the junction of the left jugular and left subclavian vein (5).

It is very unusual to injure the thoracic duct during adult cardiac surgery through a median sternotomy, because the course of the thoracic duct is never directly within the operative field, although some authors suggest a traction injury in which indirect forces were transmitted that tore the thoracic duct during manipulation of the heart and aorta during the operation (6).

Possible mechanisms of leakage in our case is the injury to an active thymus gland or abnormal lymph channels of the pericardium.

The diagnosis of chylopericardium is usually confirmed

by a triglyceride level of 110 mg/dL or greater, the presence of chylomicrons in the drainage, a positive Sudan stain, or if needed a lipoprotein electrophoresis.

Conservative and expectant management has been the mainstay during previous years with few reports of surgical approach. Total parental nutrition with complete cessation of all oral intake, somatostatin, medium-chain triglyceride diets and thoracic duct ligation have been attempted to treat different clinical scenarios. Time required for complete recovery has varied from days to months in these situations.

Rodrigues et al suggests that early definitive surgical treatment is a feasible option, which shortens the hospital stay and minimizes the complications related to chylous leak, especially protein malnutrition and reduced immunity (7). Other authors go beyond that saying that surgical management is the most successful treatment. Conservative therapy is reserved for patients with idiopathic chylopericardium, those with an untreatable etiology, those considered at high risk for surgical treatment, or those with a predictably short lifespan (4).

We believe that conservative treatment may be effective in some cases but we need to know its limitations and cut-offs in terms of expecting time and amount of daily fluid drainage to establish good indications to go on the option of surgery. Early intervention decreases the possibility of complications related to metabolic, immune and nutritional impairment and also costs and hospital stay. Further experience and investigation is needed to have a good algorithm for the treatment of this complication after cardiac surgery.

4. CONCLUSION

We present a case of chylopericardium after mitral valve repair for rheumatic disease, due to thymus gland tributaries injury.

CONFLICT OF INTEREST: NONE DECLARED

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