Persistent medical management of chylopericardium following orthotopic heart transplant

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Citation: Jackson E, Khan A, Yonan N. Persistent medical management of chylopericardium following orthotopic heart transplant. JSCR. 2010 6:8

ABSTRACT

We describe a case of chylopericardium post orthotopic heart transplant, having had previous cardiac surgeries. This was managed conservatively for a prolonged period after which the patient recovered. We emphasise the fact that medical management works although the recovery time may be prolonged.

INTRODUCTION

There have been 2 previous published cases of chylopericardium following orthotopic heart transplant. We report our successful management which involved prolonged conservative treatment.

CASE REPORT

A 59 year old lady underwent heart transplantation in December 2009 for dilated cardiomyopathy. She had previous cardiac surgeries and chronic renal impairment prior to transplant. Transplantation was uneventful. On day 14 a pericardial effusion was found but showed no evidence of tamponade. This increased over the next 2 days to the point of compromise. The patient was taken to theatre where 1000ml of fluid was drained from the pericardium and a pericardial drain left in situ. Drainage continued at a rate of 100ml per hour until day 20 post op. It was noted that the fluid draining was milky. Laboratory data showed no bacteria and a triglyceride level of 2.1mmol/L (normal is ? 1.6mmol) which was diagnostic of chylopericardium. A low fat diet was commenced. This was preferred over the surgical option as a trial before invasive management and also due to her recovering left and right ventricular function post transplant. The drainage continued at between 650 - 1500ml/24 hours over the following week and therefore the patient was switched to Total Parenteral Nutrition (TPN)

Drainage then fell from 500ml/24 hours to 150ml/24 hours over the next 20 days. The patient had worsening of her renal impairment requiring haemodialysis, thus the TPN volumes. A cardiac biopsy showed no rejection (grade 0). On day 60 post op the drain was electively removed when drainage was less than 100ml/day. On day 89 the patient was commenced on a normal diet and an echo showed no evidence of pericardial effusion. During the course of the treatment patient remained as an in patient at the hospital. The patient was mobile and needed daily physiotherapy as part of the rehabilitation process.

DISCUSSION

Chylopericardium following heart transplant is rare because the vessels commonly damaged are distant to the operating site. Chylopericardium was first diagnosed at post mortem in 1888 by Hasebrock. Chylopericardium following an operation was first reported in 1971 (1). Prior to 2007 intrapericardial procedures had resulted in 33 reports of chylopericardium. Only two cases of chylopericardium have been reported following orthotopic heart transplant (2,3).

The most common cause of chylopericardium is idiopathic in healthy patients with no history of pericardial procedures (4). The main causes of a secondary chylopericardium include malignancy, obstruction of the thoracic duct, surgical interventions and trauma (5).

The diagnosis of chylopericardium is based on thick white milky fluid in the chest drain, analysis of which shows a triglyceride concentration of greater than 110mg/dL and a high lymphocyte count (6). Sudan III dye can be given orally, and if seen in the pericardium indicates chylopericardium.

The thoracic duct is most vulnerable in the upper part of the left side of the chest, especially during procedures involving the mobilisation of the aortic arch, left subclavian artery or oesophagus. Damage to the lymphatic vessels during intrapericardial procedures occurs during stretching the sternotomy wound, when the caval structures are encircled, during cardiopulmonary bypass or when the pulmonary artery and aorta are clamped and transected during a heart transplant (2).

There is no classical presentation of chylopericardium. Patients can either be asymptomatic or present with symptoms of cardiac tamponade. The most common presentations are dyspnoea, fatigue and cough. Pericardiocentiesis should be performed and fluid sent for bio-chemical analysis

Chylopericardium is of concern as a large pericardial effusion after transplantation can be related to acute rejection (7). Chyle leak can lead to cardiac tamponade, hypovolaemia due to fluid and protein loss, electrolyte imbalance, and immune deficiency due to loss of t lymphocytes (5). In transplant patients the loss of T lymphocytes could reduce the risk of rejection, but the loss of cyclosporine which also occurs may increase the risk of rejection (1).

Conservative treatment for idiopathic chylopericardium is less successful than surgical treatment, whereas in traumatic injury with chylopericardium conservative treatment is often successful (4).

The treatment aim is to reduce the flow of chyle allowing damaged vessels to heal. In a symptomatic patient it is imperative to drain the effusion to improve heart function, preventing tamponade. Compared to chylothorax, tamponade is a greater risk in chylopericardium and surgical drainage should be considered earlier (5). A diet rich in medium chain triglycerides should be commenced, which are absorbed directly into the hepatic circulation. If unsuccessful, TPN should be initiated. Somatostatin can also be given to decrease the flow of

chyle (8).

If conservative management fails, surgical exploration to ligate the leaking vessel can be considered but only if the leak has persisted for greater than 3 weeks or drainage is greater than 1000ml/day (6). Ingestion of a food source rich in lipids or a lymphangiogram can be performed to identify the site of the leak. The treatment of choice for surgical intervention is video assisted thoracoscopic surgery (3). The thoracic duct should be ligated close to the diaphragm.

The 2 recorded cases of chylopericardium post transplant used different management techniques. The first published report followed a conservative approach and the second took a conservative approach but switched to a surgical approach.

Mortality from chylopericardium is low with only 1 report of death due to an undiagnosed chylopericardium which caused cardiac insufficiency due to cardiac tamponade (9). Although rare chylopericardium carries a mortality risk and so must be treated promptly.

Our patient had two previous cardiac surgeries which could well have caused in the mediastinum making it prone to iatrogenic damage during transplant. Our patient recovered fully, without further surgical intervention. Both previous cases reported the patients also recovered fully, with a recovery time of 1 month with conservative treatment (2) and 7 days with surgical intervention (3).

Our management was conservative, even when the patient continued to drain chyle beyond 21 days. After 41 days of conservative management the drain was removed obviating a further invasive procedure, which was of physical and psychological benefit to the patient, indicating that perseverance with the conservative management in post heart transplant patients may well provide the greatest overall benefit.

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