CHIRURGIE CARDIAQUE / CARDIAC SURGERY

DRAINING PERICARDIAL EFFUSION IN PATIENTS WITH CONSTRICTIVE PERICARDITIS: A NEED FOR CAUTION.

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Summary

Background: Constrictive pericarditis is usually associated with ascites, hepatomegaly and pleural effusion. The usually practice is to relieve the respiratory distress caused by the pleural effusion, before surgical management of the pericardial constriction. Renal failure can complicate this protocol **Objective:** To report the occurrence of perioperative renal failure in patients with constrictive pericarditis, who got tube thoracostomy before pericardiectomy. **Methodology:** This is a retrospective report of constrictive pericarditis patients who had post tube thoracostomy renal failure. **Results:** 3 patients had renal failure post tube thoracostomy: 1. S.D, a 28-year-old female who had a left tube thoracostomy that drained 3.7 liters of pus over 48 hours. She developed acute renal failure, and she died on the 6th day post tube thoracostomy; 2. H.M, a 40-year-old female who had a right tube thoracostomy that drained 2.3 of effusion over 72hrs. She went into acute renal failure, but she was successfully managed; 3. U.M, a 37-year-old male, who had subxyphoid tube pericardiostomy and right tube thoracostomy simultaneously. Tube thoracostomy was slowly drained; he however went into acute renal failure, which was successfully managed. He eventually had a successful pericardiectomy. **Conclusion:** Drainage of pleural effusion in patients with constrictive pericarditis can be complicated by acute renal failure. Caution should be exercised in the management of such patients.

Key-words: Pleural effusion,Constrictive pericarditis, Renal failure

Résumé

Contexte: Le drainage de l'épanchement pleural chez les patients atteints péricardite constrictive peut entraîner une insuffisance rénale **Objectif:** Attirer l'attention des praticiens sur la possibilité de survenue d'une insuffisance rénale périopératoire chez les patients atteints péricardite constrictive, ayant bénéficié d'un drainage pleural avant la péricardectomie.
Méthodologie : Etude rétrospective portant sur tous les cas de patients présentant une insuffisance rénale après la pose d'un drain thoracique. **Résultats:** Nous avons retenus 3 patients ; 1. SD, une femme de 28 ans qui avait eu un drainage pleural gauche ramenant 3,7 L de pus en 48 heures. Elle est décédée 6 jours plus tard dans un tableau d'insuffisance rénale aigue.

2. HM, patiente de 40 ans, chez qui avait été posé un drain pleural droit ramenant 2.3L en 72heures. Elle avait présenté une insuffisance rénale aiguë, qui a été pris en charge avec succès. 3. UM, un homme de 37 ans, qui avait bénéficié simultanément d'une pericardiostomie et d'un drainage pleural à droite. L'épanchement pleural a été lentement vidé; néanmoins il a présenté une insuffisance rénale aiguë, qui a été managée avec succès. La péricardectomie avait été réalisée avec des suites simples. **Conclusion:** Le drainage de l'épanchement pleural chez les patients présentant une péricardite constrictive , devrait être faite avec prudence.

Mots clés: Épanchement pleural, Péricardite constrictive, L'insuffisance rénale

Introduction

Constrictive pericarditis is an uncommon disease and can be associated with pleural effusion, ascites and hepatomegaly. Diagnosis of constrictive pericarditis is usually made late, as the pleural effusion or ascites may have attracted more attention. Pericardiectomy is done in many patients following the drainage of the pleural effusion. This approach is undertaken to allow the patient achieve optimal pulmonary function before general anaesthesia. However performing a pericardiectomy without first draining the pleural effusion has been reported(1). Renal insufficiency can occur when the pleural effusion is drained first in a patient with background pericardial constriction.

Objectives

To review the occurrence of perioperative renal insufficiency in patients with constrictive pericarditis, who had tube thoracostomy before pericardiectomy.

Materials and Methods

This is a case series review of 3 patients managed between 2011 and 2015 The clinical records of patients with constrictive pericarditis who underwent pleural drainage and developed renal insufficiency were reviewed

Results

A total of 12 patients within the study period had constrictive pericardial disease, with ages ranging from 18- 62 years and male to female ratio of 2.7 :1. Five patients had pleural effusion associated with the constrictive pericardial disease. Among these 5 patients with tube thoracostomy, 3 of them developed renal failure after tube thoracostomy.

Case No. 1 S.D, 28-year old female. She presented with cough, exertional dyspnea, orthopnea, abdominal distension of 9 months and recurrent fever of 2 months duration Physical signs were tachycardia, hypotension, distended jugular veins. The tracheal was deviated to the right with decreased vocal resonance, stony dull percussion notes and diminished breath sounds over the left middle and lower lung zones; with associated ascites Investigations Serum urea and creatinine were normal, chest X-ray revealed homogeneous opacity in the left middle and lower lung field with tracheal deviation to the right Echocardiography showed pericardial effusion of 1 cm, parietal pericardial thickening and diastolic dysfunction. Thoracic computerized tomographic scan showed parietal pericardial thickening of 5mm,pericardial effusion and left pleural effusion Management A left closed tube thoracostomy done drained 3.7 liters of pus over 48 hours. She developed acute renal failure and died on the 6th day post pleural drainage

Case No. 2 H. M,40-year old female,who presented with dyspnea on exertion, orthopnea, abdominal swelling of 5 months duration. Chest examination revealed tachypnea,tracheal deviation to the left,with reduced vocal resonance and stony dullness percussion notes in the right hemithorax. Tachycardia, hypotension and elevated jugularvenous pressure, and laterally deviated apex beat. Investigations Chest X-ray showed homogeneous opacification of the right middle and lower lung fields, and deviation of the trachea to the left.

Echocardiography showed parietal pericardial thickening and diastolic dysfunction. A chest CT scan revealed a 6mm thickening of the parietal pericardium Management She had a right chest tube inserted which drained 2.3 litres of serous fluid within 72 hours. She also went into acute renal failure post chest tube drainage. The acute renal insufficiency was successfully managed medically. She was however not seen at clinic follow up.

Case No.3 U.M, 37-year old male, who presented with chronic cough, exertional dyspnea, orthopnea and abdominal distension of 4 months duration. He had a past history of pulmonary tuberculosis. Physical examination findings were tachycardia, hypotension, elevated jugular venous pressure, muffled heart sounds. Respiartory system revealed tachypnea, tracheal deviation to the left, reduced vocal resonance, stony dull percussion note and diminished breath sounds in the right middle/lower lung zones and the lower left lung zone. Moderate ascites was also present.

Investigations

He had elevated serum urea , but normal serum creatinine. Chest X-ray revealed homogeneous opacification of the right middle and lower lung field,with tracheal deviation to the left, there was also similar but reduced homogenous opacification of the left lower hemithorax. Echocardiography revealed a 2cm pericardial effusion containing strands,thickening of the parietal pericardium and diastolic dysfunction. A thoracic computerized tomography scan revealed thickened parietal pericardium of 8mm,pericardial effusion of 2cm, and bilateral pleural effusion worse on the right.

Management

He was kept on bed rest, started on diuretics and close monitoring of fluid input and urine output. He had simultaneous right tube thoracostomy and subxyphoid tube pericardiostomy . The tube thoracostomy was gradually drained at the rate of 100 ml per hour, but the pericardial tube drained freely. He however also developed oliguria over 72 hours which was managed with adequate rehydration, diuretics and ionotropes.He recovered normal renal function and eventually had a pericardiectomy and a left tube thoracostomy after 2 weeks with no complications.

Discussion

The prevalence of chronic constrictive pericarditis has been reported as 5% of all cardiovascular diseases in West Africa[2]. Effusive-constrictive pericarditis has been reported in Ibadan, Nigeria as 13% among all patients with pericardial disease[3].

Pleural effusion is a common feature of constrictive pericarditis [4] [5], with various percentages reported from 35%[6] to 96%[4], depending on the series; and it can be unilateral[7] or bilateral[8]. It can be an exudate or a transudate[5]. A previous study in Zaria reported pleural effusion occurring in 19% of patients who had pericardiectomy for chronic constrictive pericarditis[9]. The same study by Mabogunje et al found that the patients had essentially normal blood urea nitrogen, serum electrolytes and liver function tests[9]. The pleural effusion occurring in constrictive pericarditis is usually drained either inadvertently as a result of a missed diagnosis, or deliberately to improve the patient's pulmonary function in preparation for pericardiectomy. This however is not a universal practice, as pleural effusion can resolve if the patient has a successful pericardiectomy[1].

Hemodynamic collapse following the drainage of pleural effusion in a patient with unrecognized constrictive pericarditis has been reported[7]. Our series of patients progressed to acute renal insufficiency, and we propose that hemodynamic factors may be responsible for the renal insufficiency. These patients are ordinarily at risk for cardiorenal syndrome. Cardiorenal syndrome has been defined as a pathophysiologic disorder of the heart and kidneys where an acute or chronic dysfunction of one organ can induce acute or chronic dysfunction of the other organ[10]. The pathophysiologic factors in cardiorenal syndrome include hemodynamic changes, neurohormonal (renin-angiotensin-aldosterone-system, sympathetic hyperactivity), central venous congestion, anemia and oxidative stress[11]. Our series of patients had type 1 cardiorenal syndrome- where a rapid worsening of cardiac function leads to acute renal dysfunction[10]

Considering the above pathophysiologic mechanisms responsible for cardiorenal syndrome, our series of patients seem to have been mainly affected by hemodynamic factors due to drainage of the pleural effusion.

The hemodynamic changes following pleural fluid drainage in constrictive pericarditis maybe due to:

1. Excessive third space fluid losses in a patient with reduced cardiac reserves
2. Increased venous return after drainage of the pleural effusion and reduction in intrathoracic pressure, leading to right ventricular distension shifting the interventricular septum to the left, thus impairing left ventricular filling
3. The re-expansion of the pulmonary vasculature after pleural drainage causes pooling of blood in the lungs and reduces left atrial venous return The cautious approach to management of the thrid patient in this series is notable. Adequate preoperative resuscitation to ensure rehydration and optimal urine output, then post operative intensive care unit admission were helpful.

Despite the gradual drainage of the right pleural effusion he nevertheless went into renal insufficiency, suggesting the high risk these patients represent. Close pre-,intra- and post-operative monitoring and care are therefore the most likely panacea to this dangerous scenario.

Conclusion Pleural drainage in patients with constrictive pericarditis can be complicated by acute renal insufficiency. Close monitoring, judicious use of fluids, inotropes and diuretics are needed in the management of these patients. Prospective studies to investigate the risk factors are needed.

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