Colchicine as an effective treatment for postpericardiotomy syndrome following a lung lobectomy

Takashi Eguchi*, Kazuo Yoshida, Kazutoshi Hamanaka, Makoto Kurai

Department of Thoracic Surgery, Shinshu University School of Medicine, Asahi 3-1-1, Matsumoto, Japan

Received 19 July 2010; received in revised form 23 August 2010; accepted 25 August 2010

Abstract

Postpericardiotomy syndrome (PPS) is a frequent complication of various cardiac procedures that involve entry into the pericardium, but rarely occurs after pulmonary surgery because the pericardium is usually preserved during this procedure. The standard treatment for PPS is the administration of non-steroidal anti-inflammatory drugs (NSAIDs). Recent studies have indicated however, that colchicine may be useful for the treatment and prevention of this syndrome. Here, we describe the successful use of colchicine to treat PPS in a lung cancer patient who developed this complication following a lung lobectomy. A 64-year-old woman with a stage IA lung tumor underwent a left upper lobectomy with a mediastinal lymph node dissection. Severe precordial pain occurred 10 days after surgery, and accumulations of pericardial fluid were revealed by chest X-ray, echocardiogram, and chest computed tomography. These symptoms were not alleviated by antibiotics, thoracic cavity drainage, or NSAIDs. However, the administration of colchicine (initial dose of 1.0 mg and maintenance dose of 0.5 mg daily for three months) in combination with NSAIDs resolved these symptoms immediately after the first dosage. In addition, the patient remains free of any recurrent pericarditis at six months after this episode.

Keywords: Colchicine; Acute pericarditis; Postpericardiotomy syndrome; Lung lobectomy

1. Introduction

Postpericardiotomy syndrome (PPS) is a frequent complication of various cardiac procedures, but rarely occurs after pulmonary surgery because the pericardium is usually preserved during this procedure. The standard treatment for PPS is the administration of non-steroidal anti-inflammatory drugs (NSAIDs). Recent studies have indicated however, that colchicine may be useful for the treatment and prevention of this syndrome. Here, we describe the successful use of colchicine to treat PPS in a lung cancer patient who developed this complication following a lung lobectomy. A 64-year-old woman with a stage IA lung tumor underwent a left upper lobectomy with a mediastinal lymph node dissection. Severe precordial pain occurred 10 days after surgery, and accumulations of pericardial fluid were revealed by chest X-ray, echocardiogram, and chest computed tomography. These symptoms were not alleviated by antibiotics, thoracic cavity drainage, or NSAIDs. However, the administration of colchicine (initial dose of 1.0 mg and maintenance dose of 0.5 mg daily for three months) in combination with NSAIDs resolved these symptoms immediately after the first dosage. In addition, the patient remains free of any recurrent pericarditis at six months after this episode.

© 2010 Published by European Association for Cardio-Thoracic Surgery. All rights reserved.

Keywords: Colchicine; Acute pericarditis; Postpericardiotomy syndrome; Lung lobectomy

2. Case report

A 64-year-old woman underwent a left upper lobectomy with a mediastinal lymph node dissection for a stage IA lung cancer in 2009. During the hilar lymph node dissection at surgery, the pericardium was accidentally opened but was not subsequently closed because the opening was considered to be relatively small. No pericardial bleeding was observed during the surgery. In addition, no postoperative air leakage or chylothorax complications were detected and the chest drainage tube was decannulated on postoperative day (POD) 4. At around POD 10, however, the patient experienced precordial pain with persistent fever (>38°C) which then worsened despite the administration of loxoprofen (180 mg/day). A chest X-ray on POD 17 revealed a decrease in the permeability of the left lung field and an enlargement of the cardiac silhouette (Fig. 1a). Echocardiography revealed a moderate accumulation of pericardial fluid (Fig. 1b).

We did not perform percutaneous pericardial drainage as the fluid had not caused cardiac tamponade. In addition, no pericardial or pleural friction was detected. Further electrocardiography revealed no abnormal findings. The chest pain symptoms showed no improvement upon the administration of antibiotics and following a left thoracic drainage.

Chest enhanced computed tomography (CT) analysis on POD 33 revealed a markedly thickened pericardium (Fig. 2a). At this point, we suspected PPS as the cause of the pericarditis and confirmed this diagnosis as the patient met the necessary criteria [2]. Loxoprofen was then discontinued and replaced with an aspirin regimen (2000 mg/day). However, the symptoms still showed no improvement. Colchicine was subsequently administered on POD 37 in combination with aspirin at a dose of 1.0 mg for the first day and a daily maintenance dose of 0.5 mg thereafter [3]. The chest pain symptoms dramatically improved almost immediately after the first dosage of colchicine. A chest enhanced CT on POD 49 revealed a clear improvement in the pericardial thickening and the disappearance of the bilateral pleural effusion (Fig. 2b). The dose of aspirin was gradually reduced over a two-month period although the administration of colchicine was maintained for three months [3]. The patient was free of any recurrent pericarditis at eight months after this episode.
3. Discussion

PPS is a well-known potential complication of various cardiac procedures that involve entry into the pericardium, including cardiac surgery, percutaneous left-heart catheterization, and transthoracic pacemaker insertions [1]. However, PPS rarely occurs after a thoracotomy as the pericardium is usually preserved during these procedures. This syndrome typically presents as a pleuropericardial reaction characterized by fever, precordial pain, pericardial friction, and pericardial/pleural effusions that occur about one week or more after the initial cardiac procedures [1]. Some criteria have been proposed in the diagnosis of PPS [2]. These include (1) a prior intrapericardial procedure; (2) an unexplained fever after the first postoperative week; and (3) physical signs of pericardial disease and echocardiographic proof of pericardial fluid.

The etiology of PPS includes autoimmune reactions, viral infections, and trauma. However, the autoimmune etiology appears to be most accepted based on the findings of various studies. The emerging hypothesis for this disease is that damaged tissues within the pericardial cavity, blood, or a traumatized pericardium, may cause the production of autoantibodies against the pericardial tissue and thus induce pericarditis [1, 4]. In our present case, the accidental opening of pericardium during lymph node dissection might have induced an autoimmune reaction or facilitated viral infection within the pericardium. It is also possible that pericardial bleeding might have occurred after surgery and induce an autoimmune response, although no pericardial bleeding was observed during surgery. We conclude from this that care needs to be taken to detect the occurrence of PPS if the pericardium is opened during a thoracotomy, even if small and if no bleeding is apparent.
The standard treatment for acute pericarditis is the administration of non-steroidal anti-inflammatory drugs (NSAIDs) [5]. Similarly, it has been reported that NSAIDs are effective in the treatment of PPS [6]. Recent studies have indicated however, that colchicine has significant efficacy in the prevention of recurrent pericarditis [7]. Moreover, colchicine has been proposed for the treatment and primary prevention of PPS in previous reports [8]. In our present case, a 180 mg concentration of loxoprofen had no effect during the first episode of PPS, but it is possible that this dose was suboptimal for NSAIDs [5]. A 2000 mg dose of aspirin, which is considered to be adequate for a Japanese woman of small size (height of 155 cm and weight of 50 kg), also had no effect. In contrast, colchicine significantly improved the condition of the patient and this was confirmed by CT findings. In planning this treatment, we referred to a therapeutic scheme described previously in which colchicine was used in combination with conventional therapy to treat the first episode of acute pericarditis [3]. This regimen was reported to significantly reduce both the recurrence rates and the symptom persistence compared with conventional treatment alone.

The precise mechanism by which colchicine alleviates the symptoms of acute pericarditis remains poorly understood. This agent inhibits the process of microtubule self-assembly by binding beta-tubulin, thus interfering with several cellular functions [9]. On this basis, colchicine would decrease leukocyte motility and phagocytosis and thus reduce the inflammatory response. Moreover, the colchicine levels in leukocytes may be more than 16-fold higher than the peak concentration in plasma [9] which may explain its therapeutic effects at low doses [3].

In conclusion, in cases where anterior chest pain presents following a thoracotomy procedure, particularly if the pericardium was opened during surgery, sufficient care must be taken to investigate the possibility of PPS. Colchicine should then be considered as a viable treatment.

References


eComment: Post-pericardiotomy syndrome following lung cancer surgery

Authors: Nikolaos Barbetakis, Department of Thoracic Surgery, Theagenio Cancer Hospital, A. Simeonidi 2, Thessaloniki, Greece; Christos Asteriou, Athanasios Kleonatas, Christos Lafaros
doi:10.1510/icvts.2010.248948A

We have read with great interest the article by Eguchi et al. concerning the use of colchicine as an effective treatment for postpericardiotomy syndrome following lobectomy for lung [1]. A propos of this case we would like to highlight two points:

1. According to the European Cardiology guidelines for management of recurrent pericardial disease published in 2004 ‘‘colchicine was effective when NSAIDs and corticosteroids failed to prevent relapses’’ and ‘‘the recommended dose is 2 mg/dl for one to two days, followed by 1 mg/day (level of evidence, indication I)’’ [2].

2. Despite the body evidence in support of colchicine use for prevention and treatment of post-pericardiotomy syndrome, this indication remains an off-label use for colchicine. Although it is relatively safe with gastrointestinal distress as the most common side-effects, physicians should be aware of more serious side-effects, such as bone marrow suppression, muscle damage and hepatotoxicity. Colchicine is renally cleared, thus in patients with renal impairment the serum level of the drug is increased and translates into a higher prevalence of adverse side-effects [3]. Thus, monitoring of hepatic panel, creatinine, and complete blood count should be performed prior to therapy and one month after initiation.

References