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Intrapericardial fibrinolysis: a useful treatment in the management of purulent pericarditis

Received: 19 June 1996
Accepted: 15 September 1996

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Abstract Since the introduction of antibiotics into clinical practice, purulent pericarditis has become a rare disease. The major complication of the standard management for this condition is constrictive pericarditis. We report two cases of purulent pericarditis in which intrapericardial fibrinolysis was performed in order to minimize this complication. The first case was a 38-year-old man admitted to our intensive care unit (ICU) for management of constrictive pericarditis complicating purulent pericarditis diagnosed 17 days previously. The patient was treated with four intrapericardial injections of streptokinase (250 000 IU each). Fluid drainage and cardiac output were improved. No change in clotting parameters was noted. Pericardiectomy and esophagectomy were then performed for a

diagnosis of esophageal neoplasm. The postoperative course was uneventful. The second case was a 16-year-old boy admitted with loss of consciousness due to cardiac tamponade. Percutaneous pericardiocentesis drained 900 ml of cloudy fluid. Two intrapericardial injections were performed (day 1 and day 5) without any complication. Pericardial drainage was withdrawn on day 13 and the patient was discharged from ICU on the same day. Six months later, there was no evidence of constrictive pericarditis. Intrapericardial fibrinolysis appears to be safe and effective when prescribed rapidly in the course of purulent pericarditis.

Key words Purulent pericarditis · Fibrinolysis

Introduction

The incidence of purulent pericarditis has decreased since the age of antibiotics. Standard management usually combines antibiotic therapy and surgical drainage. The major complication of this practice is constrictive pericarditis. We report two cases of fibrinolysis performed for purulent pericarditis.

Case reports

Case 1

A 38-year-old man with achalasia had been admitted to our hospital 17 days previously (day 0) with sepsis. Purulent pericarditis was found by percutaneous aspiration 4 days later. On day 6, percutaneous drainage with irrigation was performed. The bacterial flora from the pericardium fluid were the same as the oropharyngeal flora. During upper gastrointestinal endoscopy, an ulcerated lesion was found 29–35 cm from the dental arch with no obvious fistula. A biopsy showed esophageal squamous carcinoma. No obvious fistula was seen during esophageal opacification. The patient was admitted to our ICU (day 17) in view of the clinical features of constrictive pericarditis.

Fifty milliliters of purulent fluid was drained from the pericardium during the first 4 days of admission. A hemodynamic study with a Swan-Ganz catheter was performed prior to intrapericardial fibrinoly-

sis. A "dip-plateau" pattern was seen on the graph and the cardiac output was 2.53 l/min. Because of the patient's poor general status, intrapericardial fibrinolysis was performed (250000 IU of streptokinase on days 23, 25, 27, 29). The fluid collection improved significantly: day 23:160 ml, day 24:320 ml, day 25:290 ml, day 26:60 ml, day 27:170 ml, day 29:129 ml and day 30:45 ml. Among the hemodynamic parameters, blood pressure and heart rate were unchanged, but cardiac output was improved: 3.58 l/min on day 26. There was no change in echocardiographic measurements of pericardial thickness. Because of a mild improvement of his general status, pericardectomy with esophagectomy and gastric esophagoplasty were performed. During the surgical procedure, a fistula between the esophagus and pericardium was seen. After surgery, the patient's status improved and he was discharged from the ICU 10 days later. The patient is still alive 2 years later.

Case 2

A 16-year-old boy was admitted with loss of consciousness, precordial chest pain and fever. The history began 15 days before with a flu-like syndrome treated by amoxicillin without any improvement. Chest X-ray showed cardiac enlargement. Echocardiography confirmed the pericardial effusion and cardiac tamponade. Nine hundred milliliters of cloudy fluid were collected by percutaneous drainage (2400 WBC/mm³, 95% polymorphonuclear cells, germ free). The diagnosis of partially treated purulent pericarditis was made, and two intrapericardial injections of streptokinase (250000 IU each) were performed on days 1 and 5. Fluid collection was increased and ceased on day 9. The fever resolved with antibiotic therapy (ceftriaxone plus ofloxacin for 4 days, then vancomycin). No change in the clotting parameters was detected and no problems were encountered. Echocardiographic examination did not show any effusion and drainage was withdrawn on day 13 before discharge from ICU. Six months later, there was no evidence of constrictive pericarditis.

Discussion

Since the introduction of antibiotics into clinical practice, purulent pericarditis has become a rare disease. The over-

all survival rate is about 30% with antibiotic therapy alone, and 50% when combined with early complete surgical drainage. Surgical drainage can be performed percutaneously. However, when there is a thick purulent effusion and large adhesions with loculation, extensive pericardectomy is needed to achieve adequate drainage and to prevent constriction.

Like the pleura the pericardium is a closed cavity. Intrapleural fibrinolysis is routinely used in the management of empyema. Both streptokinase and urokinase are used [1, 2]. Experimentally, intrapleural streptokinase decreases the number of intrapleural adhesions, but fails to reduce the amount of pleural plaque [3]. On an experimental model of acute pericarditis with progressive constriction, early intrapericardial administration of urokinase restored local fibrinolytic activity and was an effective and safe method to prevent constrictive pericarditis [4]. Only one case report of intrapericardial fibrinolysis has been found [5]. In our first case, the only benefit was an increase in cardiac output. The partial inefficacy can be explained by the late administration of streptokinase, as the influx of fibrinogen into the pericardial space increases during the first 6 days in the experimental model [4] and a delay in initiating therapy is also a cause of low success rates of intrapleural streptokinase in empyema. In our second case, the rapidly favorable outcome was probably due to early administration.

The main point of our report is that intrapericardial fibrinolysis is a safe technique and probably useful in the management of purulent pericarditis, when performed as early as possible, to decrease the incidence of constrictive pericarditis.

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