

CASE REPORT

## Anticoagulant-induced hemopericardium with tamponade: A case report and review of the literature

### *Antikoagülasyonun indüklediği hemoperikardiyumlu tamponad: Olgu sunumu ve literatür incelemesi*

Faruk Ertaş, Nihat Polat, Abdulkadir Yıldız, Mustafa Oylumlu, Mehmet Sıddık Ülgen

#### ABSTRACT

Acute cardiac tamponade requires urgent diagnosis and treatment. We report a case of a 43-year-old man who was receiving warfarin treatment for 8 months following mitral valve replacement. The patient had complaint of dyspnea and fatigue for a few days. Cardiac tamponade was diagnosed, and the INR at that time was 10.4. Urgent pericardiocentesis were undertaken and 1400 ml of pericardial blood was drained. Following surgery the patient's recovery was uneventful. An intravenous vitamin K injection and fresh frozen plasma transfusion were administered to reverse the patient's over-anticoagulated state. The final pathology revealed chronic inflammation and there was no malignancy, and no bacteria or mycobacterium were seen. Emergency physicians should remember that over-anticoagulation with warfarin may contribute to certain complications, including hemopericardium, and that strict control of target INR should be the goal for patients who require continuous warfarin treatment. *J Clin Exp Invest* 2013; 4 (2): 229-233

**Key words:** Hemopericardium, tamponade, oral anticoagulation, warfarin, echocardiography

#### INTRODUCTION

Cardiac tamponade is a life-threatening emergency condition as a result of fluid accumulation in pericardium which primarily disrupts right atrial and ventricular filling [1]. Several conditions such as pericarditis, malignancy, acute myocardial infarction, end-stage renal disease, congestive heart failure, collagen vascular diseases, viral and bacterial infections can cause pericardial effusion resulting in tamponade [2]. Hemopericardium may develop after trauma, aortic dissection, myocardial infarction, malignancy and invasive procedures. Presentation with hemopericardium and cardiac tamponade due to warfarin intoxication is a very rare condition.

#### ÖZET

Akut kardiyak tamponad acil tanı ve tedavi gerektirir. Biz 43 yaşında, erkek ve mitral valv replasmanı sonrası sekiz aydır warfarin tedavisi alan bir olguyu aldık. Hastanın birkaç gündür başlayan nefes darlığı ve halsizlik şikayetleri mevcuttu. Kardiyak tamponad tanısı konuldu ve 1400 ml mai perikardiyosentezle acil olarak drene edildi. Tanı sırasında İNR değeri çok yüksek olan hastaya Vitamin K antagonistleri ve taze donmuş plazma verilerek yüksek koagülasyon durumu geriye döndürüldü. Patolojik inceleme sonucunda enfeksiyon ve malignensi saptanmadı. Hastada kronik inflamasyon düşünüldü. Sonuç olarak warfarin overdoz acil bir durum olup hemoperikardiyumlu tamponada yol açabilmektedir. Bunun için warfarin tedavisi başlanılan hastalarda warfarin dozu ve hedef İNR değerleri sıkı kontrol edilmelidir.

**Anahtar kelimeler:** Warfarin, hemoperikardiyum, tamponad, İNR

Here, we are presenting a case of cardiac tamponade as a result of warfarin intoxication and a review of the literature.

#### CASE

A 43-year-old man applied to the emergency room with a complaint of dyspnea and fatigue for a few days. His blood pressure was 80/50 and heart rate was 132/min. immediately, after admission the patient developed syncope. With IV fluid therapy the patient got conscious. The patient was on 5 mg/day warfarin therapy because of prosthetic mitral valve for 8 months. Twelve-lead electrocardiogram [ECG] revealed sinus rhythm and low voltage in chest and

Dicle University Faculty of Medicine Department of Cardiology Diyarbakır, Turkey

**Correspondence:** Faruk Ertaş,

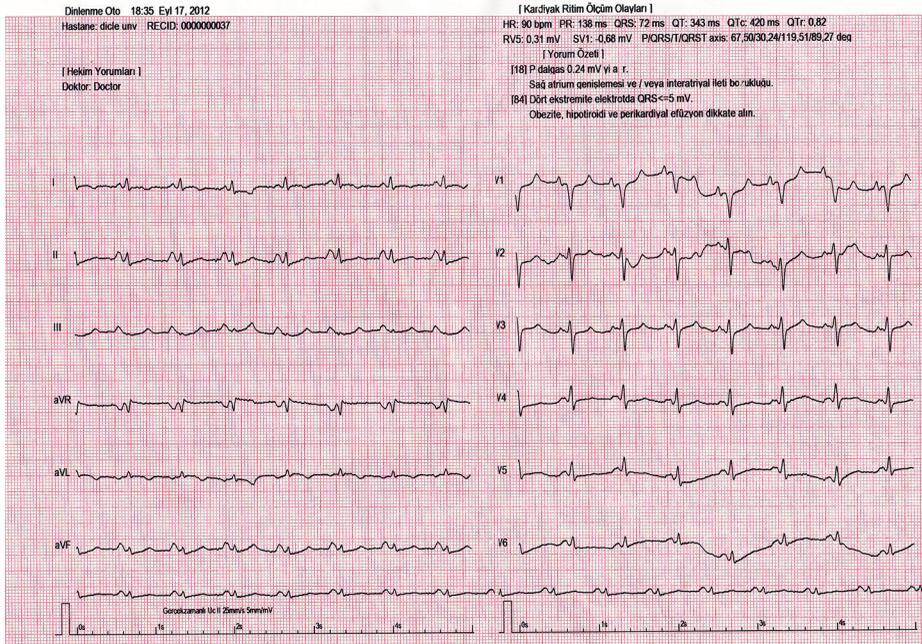
Dicle University Faculty of Medicine, Department of Cardiology, Diyarbakır, Turkey Email: farukertas@hotmail.com

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extremity leads [Figure 1]. On chest radiogram cardiomegaly and blunt costophrenic sinuses were detected [Figure 2]. International normalized ratio (INR) was 10.4. Bedside echocardiography detected pleural effusion and a severe pericardial effusion with right ventricular collapse [Figure 3]. The patient was taken to the intensive care unit and emergent pericardiocentesis [P/S] was performed via subcostal route. A total of 1400 cc hemorrhagic fluid was

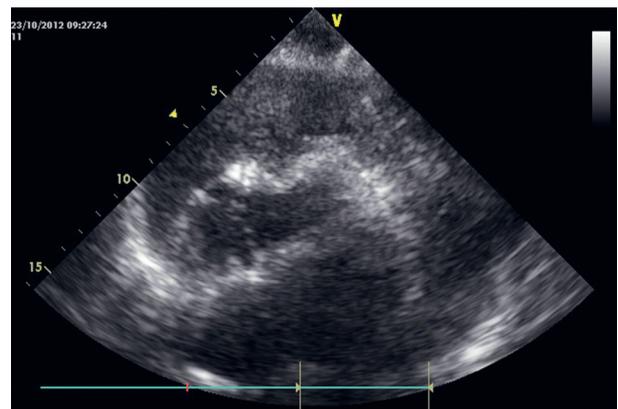
evacuated. After P/S blood pressure was 120/70 and heart rate was 92/dk. INR was normalized after 4 units of fresh frozen plasma and 5 mg intravenous vitamin K. We didn't find any detectable cause in the examination of pleural and pericardial fluids. Although mild pericardial effusion was detected on the follow-up echocardiograms, warfarin therapy was initiated and the patient was discharged after reaching the target INR value.



**Figure 1.** Sinus rhythm and low voltage in chest and extremity leads



**Figure 2.** Chest radiogram shows cardiomegaly and blunt costophrenic sinuses



**Figure 3.** Echocardiography show that a severe pericardial effusion with right ventricular collapse

## DISCUSSION

The most common causes of pericardial effusion are infections (viral, bacterial, especially tuberculosis), cancer, connective tissue disorders, peri-

cardial injury syndromes [postmyocardial infarction effusions, postpericardiotomy syndromes, posttraumatic pericarditis], metabolic diseases [especially hypothyroidism, anorexia nervosa], myopericardial

**Table 1.** Cases of warfarin induced pericardial tamponade in the literature

Reference	Sex/age	Indication of warfarin	Warfarin dose/INR	Symptom of the patient	Diagnostic tool	Treatment	Outcome
Granot <sup>5</sup>	M/48	DVT	?/PT 42 s	Pain shoulders, dyspnea, abdominal discomfort	TTE	Pericardiocentesis 2500	Survive
Wong <sup>6</sup>	F/59	MVR	?/9	Symptoms of tamponade	TTE	FFP Pericardiocentesis 900 cc	Survive
Wong <sup>6</sup>	M/63	AVR	?/5.4	Malaise, worsening dyspnoea	TTE	FFP Pericardiocentesis 800 cc	Survive
Lee <sup>7</sup>	M/67	Vertebral-basilar arterial insufficiency	PT 30s	Weight gain, Abdominal distension, dyspnea	TTE	K vit, FFP Pericardiocentesis 2000 cc	Survive
Jadoon <sup>8</sup>	F/75	AF	?/>8	malaise, diaphoresis, chest pain	TTE	Thoracotomy 300cc	Survive RV laceration secondary to PM wire perforation
Katis <sup>9</sup>	F/67	PE	5mg/3,51	Chest pain, dyspnea	CT TTE	K vit, FFP, pericardiocentesis 600cc	Survive
Hillyard <sup>4</sup>	M/?	DVT prophylaxis	10mg/3.5	Cough, fatigue, and malaise	TTE	K vit, FFP Pericardiocentesis 1100 cc	Survive
Yu-Cheng Hong <sup>10</sup>	F/70	MVR	5mg/7,52	Dyspnea and orthopnoea	TTE	K vit, FFP pericardiocentesis 1300cc	Survive
Griffiths <sup>11</sup>	M/?	Embolic stroke	?/>15	Collapsed,	Autopsy	950cc	Exitus
Braiteh <sup>12</sup>	F/74	PE	?/PT 17.6 s	Dyspnea, Chest tightness	TTE	Pericardial window procedure, 750cc	With non-small cell lung carcinoma
Levis <sup>13</sup>	M/54	AF	?/6	Syncop, chest pain, shortness of breath, palpitations	TTE	K vit, FFP pericardiocentesis 1100cc	Survive
Gumrukcuoglu <sup>14</sup>	F/27	DVT	5mg/d 13.8	Chest and Abdomen pain, syncop	CT TTE	K vit, FFP Pericardiocentesis 1100 cc	Exitus
Gumrukcuoglu <sup>14</sup>	M/32	MVR	?/15.5	Syncopal episode, shortness of breath and palpitations	TTE	Pericardiocentesis 600 cc	Exitus
DH Hsi <sup>15</sup>	M/49	PE, factor V Leiden abnormality	15 mg/?	Dyspnea, orthopnea	CT TTE	Pericardiocentesis 1300cc	Survive
Al-Jundi <sup>16</sup>	F/65	DVT, PE, AF	?/16,9	Epigastric pain, fullnes	CT TTE	K vit, Protrombin consante, pericardiocentesis 750 cc	Survive
Reed <sup>17</sup>	M/53	PE	?/6	Shortness of breath and chest pain	CT TTE	Pericardiocentesis 2000 cc	Survive
Our case	M/43	MVR	7.5/10.4	Fatigue, shortness of breath, syncope	TTE	Pericardiocentesis 1400 cc	Survive

AF: Atrial fibrillation, AVR: Aortic valve replacement, CT: Computed tomography, DVT: Deep vein thrombosis, F: Female, FFP: Fresh frozen plasma, M: Male, MVR: Mitral valve replacement, PT: Prothrombin time, TTE: Transthoracic echocardiography

diseases [especially pericarditis, but also myocarditis, heart failure] and aortic diseases [3]. In this case we present a rare cause of pericardial effusion, significant INR elevation, resulting in pericardial tamponade. The risk of non-traumatic bleeding in patients taking warfarin is less than 10%, the risk of bleeding into pericardial space is less than 1% [12]. We suppose that pericardial tamponade is much lesser. In our case, 8 months after MVR operation, the patient developed cardiac tamponade due to warfarin intoxication with an INR 10.4. There was no history of trauma or drug ingestion that can interact with warfarin.

We have detected elevated transaminase levels suggesting liver dysfunction, however, the patient had normal liver function tests 2 months ago and hepatitis markers were negative.

After pericardiocentesis transaminases and renal function tests return to normal in a short time showing liver dysfunction was not the cause of INR elevation but the result of tamponade.

In the literature there are few cases of warfarin induced pericardial tamponade. Basic features of these cases are summarized in Table 1. Including our case, a total of 17 patients developed cardiac tamponade due to warfarin overdose. Majority of patients with cardiac tamponade develop dyspnea, less frequently chest pain, cough, palpitation and lethargy [2]. In this series of cardiac tamponade, admission complaints of the patients were dyspnea, chest pain and orthopnea and epigastric pain. Syncope was observed in 25% of the patients before or after admission. The mortality was high in this group of the patients up to 17%.

In patients with prosthetic valves pericardial tamponade was detected by echocardiography, while computed tomography was the diagnostic tool in patients without prosthetic valves. This shows us presence of a prosthetic valve leads us whether cardiac or other origins are going to be examined first in patients presenting with dyspnea to the emergency room. Because of the similarity of prosthetic valve dysfunction and tamponade presentations echocardiography is the chosen method in differential diagnosis of dyspnea in patients with prosthetic heart valves.

Transthoracic echocardiography performs particularly well in the diagnosis of pericardial effusions, tamponade, and constrictive pericarditis. On the other hand, both computed tomography, and magnetic resonance are becoming more widely available and provide novel and complementary in-

formation with respect to the morphologic and functional features of the diseased pericardium [18].

In this series, more than half of the cases were diagnosed by echocardiography. In cases diagnosed by CT, echocardiography was performed to evaluate whether the pericardial effusion was causing a tamponade or not, and clarification of the P/S indication. This shows us the importance of echocardiography in the diagnosis and treatment of pericardial effusion and tamponade.

Main treatment of the pericardial tamponade is P/S. In a study of 1127 patients echocardiography-guided pericardiocentesis has been demonstrated to be a safe and effective procedure that can be performed at bedside [19]. In this study, because of the high INR levels patients were given fresh-frozen plasma and vitamin K and then echocardiography-guided pericardiocentesis was performed. There was no procedure-related complications showing echocardiography-guided pericardiocentesis is a safe procedure with low complication rates even in patients with high INR. In our case because of the unstable hemodynamic status of the patient we urgently performed echocardiography-guided pericardiocentesis via subcostal route.

In conclusion, cardiac tamponade should be kept in mind in the differential diagnosis of patients on warfarin therapy presenting to the emergency room with hypotension or syncope. It can be diagnosed easily by echocardiography and computed tomography and treated effectively by P/S. Other surgical treatments are rarely necessary. Any delay in the diagnosis increase the mortality risk.

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