



# Pericardiocentesis in patients with thrombocytopenia and high international normalized ratio: Case report and review of the literature

Alper Kepez, Ibrahim Sari, Altug Cincin & Kursat Tigen

To cite this article: Alper Kepez, Ibrahim Sari, Altug Cincin & Kursat Tigen (2014) Pericardiocentesis in patients with thrombocytopenia and high international normalized ratio: Case report and review of the literature, Platelets, 25:2, 140-141, DOI: [10.3109/09537104.2012.749981](https://doi.org/10.3109/09537104.2012.749981)

To link to this article: <https://doi.org/10.3109/09537104.2012.749981>



Published online: 18 Dec 2012.



Submit your article to this journal [↗](#)



Article views: 1122



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)

LETTER TO THE EDITOR

## Pericardiocentesis in patients with thrombocytopenia and high international normalized ratio: Case report and review of the literature

Alper Kepez, Ibrahim Sari, Altug Cincin & Kursat Tigen

Department of Cardiology, Marmara University, Istanbul, Turkey

**Keywords:** *Thrombocytopenia, pericardiocentesis, international normalized ratio*

Pericardial tamponade is a life-threatening condition characterized by critical impairment in diastolic filling and resultant low cardiac output. The time interval in which the fluid accumulates in the pericardial space is one of the primary determinants of progression to tamponade physiology due to increase in intrapericardial pressure [1]. In the cases of bleeding in pericardial space (hemopericardium), tamponade may develop rapidly and emergent drainage of fluid may be mandatory [1]. Although pericardiocentesis is the treatment method for tamponade and/or pericardial effusion, there is no assuring data on the safety of procedure in the setting of thrombocytopenia. In this article, we describe a case of successful pericardiocentesis for a patient with pericardial tamponade resulting from hemopericardium due to chemotherapy-induced severe thrombocytopenia and an international normalized ratio (INR) value of 2.46.

A 44-year-old male was admitted to emergency service with the complaints of rapid onset severe dyspnea, feeling of pressure on chest, and dizziness. His medical history revealed that he had been under treatment for multiple myeloma and had received last dose of chemotherapy regime (which consisted of bortezomib, cyclophosphamide, and dexamethasone) 30 days before admission. He had been diagnosed as multiple myeloma 30 months ago and autologous bone marrow transplantation had been applied three months after the initial diagnosis. He had had multiple doses of chemotherapy and radiotherapy.

On physical examination, his heart rate was regular at a rate of 130/min and his blood pressure was 70/40 mmHg. He had bilateral jugular venous distension and bilateral basilar crackles on lung auscultation. His heart sounds were rhythmic without murmur and no additional sound could be auscultated. His systolic blood pressure was observed to decrease more than 10 mmHg with inspiration, thus pulsus paradoxus was accepted to be present on cardiovascular examination.

His complete blood count revealed a hemoglobin (Hb) value of 5.3 g/dl and platelet count of 10 000 cells/ $\mu$ l. His

white cell count was 12 100 cells/ $\mu$ l. On his routine biochemistry examination, his blood urea nitrogen was 42 mg/dl and serum creatinine value was 3.22 mg/dl. His serum electrolyte concentrations were within normal limits. His liver function tests were also elevated with alanine aminotransferase value of 653 U/l and aspartate aminotransferase value of 833 U/l. His serum bilirubin levels were normal. He had a significantly prolonged prothrombin time with an INR value of 2.46.

His electrocardiography revealed sinus tachycardia with a rate of 130/min and low-voltage QRS on limb derivations. Transthoracic echocardiogram showed massive pericardial fluid and diastolic compression of right ventricle.

Emergent needle pericardiocentesis via subxiphoid approach was performed at the patient's bedside due to hemodynamic instability. The optimal puncture site and the direction for pericardiocentesis were determined under echocardiographic guidance. After the pericardial space was reached, a soft pigtail catheter was placed in the pericardial space. Three hundred millimeters of hemorrhagic effusion was drained during the initial procedure and the hemodynamic status improved promptly; his blood pressure raised to 120/80 mmHg and heart rate declined to levels around 70/min. Additional 750 ml of hemorrhagic effusion was drained over the following two days.

Biochemical analysis of pericardial fluid demonstrated an albumin level of 3.5 m/dl, a glucose level of 69 mg/dl, and LDH level of 1393 U/l. Pericardial fluid examination was unremarkable for any evidence of malignancy or infection.

A total of eight units of platelet suspension, four units of red blood cell concentrates, and four units of fresh frozen plasma were given to the patient during the following two days. His Hb level raised to 10.2 mg/dl and his platelet count to 53 000 cells/ $\mu$ l. His INR level decreased to 1.57. Because his urine output was below 400 ml/day, the patient underwent hemodialysis treatment during hospitalization. His

hemodynamic condition remained stable and he was transferred to hematology service four days after initial hospitalization.

We performed percutaneous pericardiocentesis to a patient with severe thrombocytopenia and high INR value. Our case demonstrates that percutaneous pericardiocentesis can be performed safely even in patients with bleeding diathesis.

European Society of Cardiology guideline on the diagnosis and management of pericardial diseases states aortic dissection as a major contraindication and uncorrected coagulopathy, anticoagulant therapy, and thrombocytopenia with  $<50\,000/\mu\text{L}$  as relative contraindication to pericardiocentesis [2]. However, literature data regarding the feasibility of pericardiocentesis in patients with uncorrected bleeding diathesis are limited. There are only several case reports all of which demonstrated that pericardiocentesis is safe and effective in subjects with thrombocytopenia [3–6]. Moreover to our knowledge, pericardiocentesis in the setting of both thrombocytopenia and high INR has not been reported previously.

Hemopericardium and resulting tamponade can occur from any form of chest trauma, aortic dissection, malignancies, and as a complication of invasive procedures. It may also occur due to bleeding diathesis in patients with certain type of hematological disorders or congenital coagulation defects [7]. A number of factors might have contributed to the pericardial effusion and tamponade in our patient. Chronic renal failure is common in the course of multiple myeloma and our patient might have suffered uremic pericarditis. Severe thrombocytopenia and high INR due to liver dysfunction seem to have facilitated the bleeding into pericardial space. Malignant pericardial infiltration has been reported to be rare for multiple myeloma and we could not demonstrate any involvement with cytological examination [8].

Pericardiocentesis was a risky procedure for our patient with severe thrombocytopenia and high INR. However, in a hemodynamically unstable patient there are no absolute contraindications for the procedure and withdrawal of even a small amount of pericardial fluid may be life-saving even under unusual circumstances such as severe thrombocytopenia. Additionally, because both entry point (xiphoid

region–apical region) and pericardial space are not vascularized regions we believe that the expected rate of hemorrhagic complication would not be high although there is not enough data on this issue.

In conclusion, in patients with tamponade and/or pericardial effusion for whom thrombocytopenia and/or high INR the present percutaneous pericardiocentesis is still the viable life-saving maneuver if there is hemodynamic instability.

**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

## References

1. Jacob R, Grimm RA. Pericardial disease. In: Carey WD, editor. Cleveland Clinic: Current clinical medicine, 2nd edn. Philadelphia, PA: Saunders Elsevier; 2010. pp 145–153.
2. Maisch B, Seferovic PM, Ristic AD, Erbel R, Rienmüller R, Adler Y, Tomkowski WZ, Thiene G, Yacoub MH. Guidelines on the diagnosis and management of pericardial diseases executive summary: The task force on the diagnosis and management of pericardial diseases of the European society of cardiology. *Eur Heart J* 2004;25(7):587–610.
3. Sonmez O, Gul EE, Soylu A, Acar K, Almaz E. Successful pericardiocentesis for cardiac tamponade in a patient with thrombocytopenic acute lymphocytic leukemia. *JAEM* 2012;11:188–189.
4. Marraffa J, Guharoy R, Duggan D, Rose F, Nazeer S. Vancomycin-induced thrombocytopenia: A case proven with rechallenge. *Pharmacotherapy* 2003;23(9):1195–1198.
5. Mindikoglu AL, Anantharaju A, Villanueva J, Shah N, van Thiel DH. Pericardiocentesis and pancreatic aspiration needle biopsy in coagulopathic and thrombocytopenic cirrhotic patient. *Chest* 2003;123(3):956–958.
6. Mohammed J, Filler G, Price A, Sharma AP. Cardiac tamponade in diarrhoea-positive haemolytic uraemic syndrome. *Nephrol Dial Transplant* 2009;24:679–681.
7. Deshmukh A, Subbiah SP, Malhotra S, Desmukh P, Pasupuleti S, Mohiuddin S. Spontaneous hemopericardium leading to cardiac tamponade in a patient with essential thrombocythemia. *Cardiol Res Pract* 2011;18:247814.
8. Zeiser R, Hackanson B, Bley TA, Finke J, Bertz H. Unusual cases in multiple myeloma and a dramatic response in metastatic lung cancer: Case 1. Multiple myeloma relapse presenting as malignant pericardial effusion. *J Clin Oncol* 2005;23(1):230–231.