

Case Report

Cardiac Tamponade and Pericardial Effusion in a Patient with Stage 3 Malignant Melanoma Treated with Pembrolizumab-A Case Report

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Abstract

The emergence of immunotherapy has improved the treatment of cancer. One of such agents is Pembrolizumab, a humanized antibody which acts as an immune checkpoint inhibitor, used in the treatment of melanoma and non-small cell lung cancer. We discuss a rare case of pericardial effusion due to pembrolizumab. A 75-year-old male with stage 3 malignant melanoma, presented with dyspnea after receiving the fourth course of Pembrolizumab. Work-up revealed moderate to large pericardial effusion with tamponade effect and emergent pericardiocentesis was done.

Keywords: Cardiac tamponade; Pericardiocentesis; Immunotherapy

Introduction

The introduction of immunotherapy has revolutionized the treatment of cancer, with improved clinical outcomes [1]. One of such agents includes Pembrolizumab, a humanized antibody which acts as an immune checkpoint inhibitor indicated in the treatment of melanoma and non-small cell lung cancer [2]. It works primarily by binding to Programmed Cell Death Protein 1 receptors of lymphocytes, allowing the immune system to target cancer cells [3]. One principal setback is the immune-dysfunction side effect associated with immunotherapy treatment stemming from the inability to differentiate self from non-self-cancer cells [4]. We describe a unique case of pericardial effusion due to pembrolizumab.

Case Presentation

A 74-year-old male with a history of BRAF negative malignant melanoma status post resection, with recurrent neoplasm involving lymph nodes of the base of the left neck who presented with palpitations, diarrhea, and difficulty in breathing. Symptoms began 3 weeks after his fourth course of adjuvant therapy. On presentation he was dehydrated, tachycardia, hypertensive and had positive Kussmaul sign on examination. His heart sounds were muffled, with clear lung bases bilaterally. His lactic acid levels were elevated as well as his creatinine in keeping with acute kidney injury. Results of EKG showed sinus Tachycardia, with low voltages and pulsus alternans

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(Figure 1). Transthoracic Echocardiogram showed moderate to large pericardial effusion surrounding the right ventricle with diastolic collapse (Figure 2).

Decision-Making

The patient was commenced on Intravenous fluid normal saline, oxygen therapy, was evaluated by cardiology and subsequently had emergency pericardiocentesis with about 250 ml of fluid evacuated from the pericardial cavity with improvement in symptoms. Pericardial fluid analysis showed acute inflammation without malignant cells.

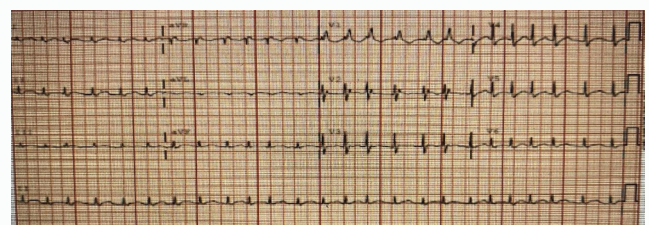


Figure 1: Electrocardiogram showing low voltage QRS complexes and electrical alternans.



Figure 2: Transthoracic echocardiogram showing moderate to large pleural effusion.

The patient was placed on steroids and a consensus was reached to discontinue Pembrolizumab and pursue other lines of treatment as determined by the hospital tumor board.

Discussion

Immune related adverse events are commonly associated with immunotherapies. Cardiotoxic adverse effects are more commonly experienced with the use of immune checkpoint blockade in recent times. This includes pericardial effusion and cardiac tamponade oftentimes presenting atypically [5]. The exact incidence of pericardial disease in cancer patients treated with Immune checkpoint inhibitors including Pembrolizumab is unknown with rates ranging from 0.1% to approximately 7% [3]. In our patient, the cause of pericardial effusion was less likely related to malignancy as fluid cytology was unremarkable for malignant cells [6]. Common symptoms at presentation include dyspnea, tachycardia and chest pain with some patients presenting with overt shock [5]. Pericardial effusion with tamponade presents a life-threatening event requiring urgent intervention pericardiocentesis, pericardial window or surgical drainage [7,8]. With regards to treatment, current recommendations require the use of corticosteroids at the lowest effective dose and use of other immunosuppressants if no response after 72 hours [9].

Conclusion

Pericardial effusion is a potentially fatal complication of Pembrolizumab. Though incidence remains rare, a high index of suspicion should be maintained in patients receiving this immune checkpoint inhibitor. Decision to continue therapy after a cardiovascular event such as Pericardial Effusion depends on multiple entities. The potential benefit of increased surveillance with Transthoracic Echo sounds interesting and is worth looking into, warranting further studies with more cases to inform appropriate management of these patients.

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