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Acute MI After First Sipuleucel-T Infusion for Prostate Cancer

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Acute Myocardial Infarction Masquerading as Infusion Reaction Following First Sipuleucel-T Infusion for Castration Resistant Prostate Cancer

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Introduction

• Advances in cancer therapy have improved patient survival statistics; however, treatment related adverse events can lead to significant morbidity and may be life-threatening. *Sipuleucel-T* is the first FDA approved therapeutic cancer vaccine which showed improved overall survival in patients with metastatic castration resistant prostate cancer.

• We describe a case of acute ST-segment elevation myocardial infarction (STEMI) in a patient during the first *Sipuleucel-T* infusion. Our aim is to increase physician awareness of this potential complication in order to avoid catastrophic outcomes.

Case Presentation

- A 59 year old African American male with metastatic castrate resistant prostate cancer, hypertension, type II diabetes mellitus, was receiving his first Sipuleucel-T infusion at an outpatient infusionn center when he developed sudden chills.
- No signs or symptoms of anaphylaxis were reported, however, the patient's presentation was attributed to an infusion reaction, which resolved after administration of 50mg of diphenhydramine.

- Within 20 minutes, he developed substernal chest tightness radiating to his left arm, along with dyspnea and diaphoresis. Vital signs were notable for BP 90/40, HR 94, and oxygen saturation 96% on room air. Physical exam revealed a diaphoretic male, with normal cardiac, chest, abdominal and extremity examination.

- He was given aspirin 81 mg, and sublingual nitroglycerin. EKG was obtained which showed ST-segment elevation in leads III, AVF with reciprocal depressions in the anterolateral leads (Figure 1).

- Emergent coronary angiogram revealed a mid-RCA culprit lesion with 99% obstruction with TIMI I flow (Figure 2) for which a Synergy drug-eluting stent (DES) was placed.
- During post-procedural recovery, the patient developed recurrent chest pain with repeat EKG showing worsened inferior STEMI.

- Repeat emergent angiogram revealed acute in-stent thrombosis and likely plaque protrusion in the proximal edge of the recently placed stent with distal thrombus embolization (Figure 3).
- The lesion was treated with balloon angioplasty, additional DES placement proximally, administration of eptifibatide and placement of an intra-aortic balloon pump to improve coronary perfusion.

- He improved quickly, and was discharged home in satisfactory condition with appropriate goal directed therapy.

Furthermore

- The patient had no know previous history of coronary artery disease, despite having a recent pharmacologic stress test, within the prior year, which did not reveal any inducible ischemia, and a coronary CT scan without evidence of obstructive disease. Transthoracic echocardiogram 2 months prior to presentation revealed normal ejection fraction of 60% without any wall motion abnormalities.

- This acute STEMI was therefore attributed to the Sipuleucel-T infusion. Further treatments with Sipuleucel-T were subsequently deferred by the primary oncologist.

Figures

Figure 1: **EKG revealing ST-segment elevation in leads III, AVF with reciprocal depressions in the anterolateral leads**

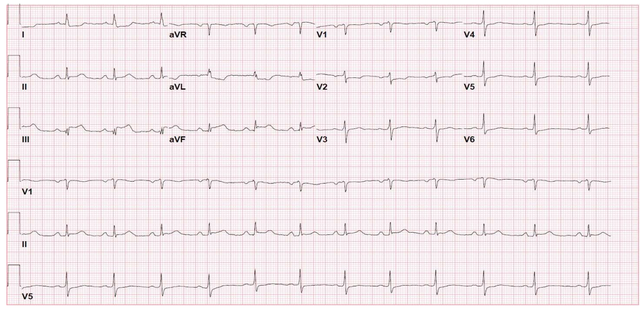


Figure 2: **Initial angiogram in the setting of inferior STEMI showing occlusion of mid-RCA (A), and post-primary PCI intervention angiogram (B) showing restoration of flow down entire RCA**

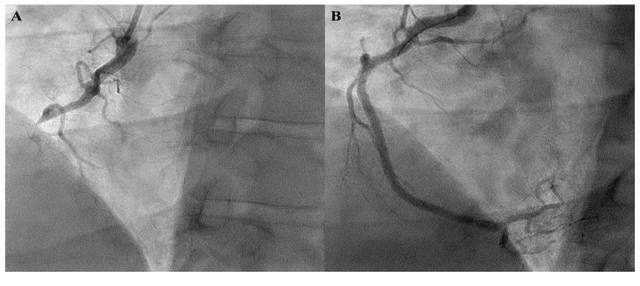
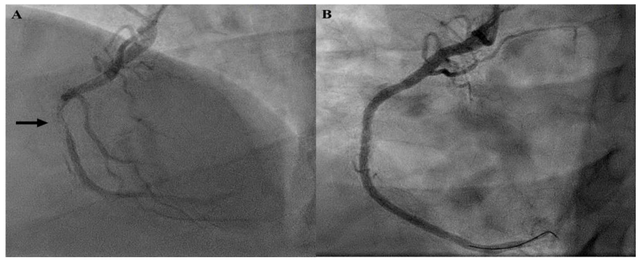


Figure 3: **Repeat emergent angiogram showing acute in-stent thrombosis (A), as marked by the arrow, with likely distal thrombus embolization, and post-repeat intervention (B) showing restoration of flow down RCA.**



Discussion

- Prostate cancer is the most common non-cutaneous malignancy, and a leading cause of cancer mortality amongst men in the Western world. Castration resistant prostate cancer occurs when disease progresses despite castrate levels of androgens.
- Historically, the prognosis of CRPC has been guarded with survival estimates of 18 to 24 months.

- *Sipuleucel-T*, a type of therapeutic cancer vaccine, is thought to work through antigen presenting cells to stimulate T-cell immune response targeted against prostatic acid phosphatase, an antigen that is highly expressed in most prostate cancer cells.
- Based on phase 3 randomized trial evidence, *Sipuleucel-T* is a category 1 recommended option for patients with metastatic CRPC who are asymptomatic or minimally symptomatic, and have good performance levels.

- Although almost a decade has passed since its approval, there remains a paucity of literature describing safety data in the post-marketing period. The most common adverse events among patients treated with *Sipuleucel-T* were chills, fatigue, fever, back pain, nausea, arthralgia, and headache.

- A recent descriptive analysis of FAERS database identified 38 reports (all serious) of acute myocardial infarction. Cardiac risk factors (hypertension, diabetes, coronary artery disease, or hyperlipidemia) were specified in 68% of reports. Most events occurred after the second (n = 14) or third (n = 11) dose of *Sipuleucel-T*; 6 events occurred after the first dose, and 5 reports did not specify the timing of subsequent MI. Most MIs occurred within 1 week of a *Sipuleucel-T* infusion (19 [53%], with 12 of these reports describing MI on the same day as an infusion) or 8 to 30 days after an infusion (n = 11).

- The mechanism of development of acute STEMI with *Sipuleucel-T* infusion is unclear, but could be related to activation of T cells and cytokines along with other mediator release leading to inflammation and possibly coronary vasospasm and/or thrombus formation.

Conclusion

- *Sipuleucel-T* is a category I recommended option for patients with metastatic CRPC. Infusion related adverse events are common, of which serious cardiac events, including myocardial infarction, have been noted with its infusion, particularly in patients with cardiac risk factors.

- To our knowledge, this is the first case report describing STEMI in a patient during the first *Sipuleucel-T* infusion. Increased awareness of this potential adverse event is important for involved physicians, not only for prompt diagnosis to avoid significant morbidity and mortality of affected patients, but in order to help risk-stratify which patients would be considered appropriate candidates for such therapy.

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