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ACS in a Middle Aged Female with Cervical Cancer-A Chip Case

Punish Sadana*, Preeti Sharma and Runu Sharma

Associate Director Cardiology, Max Superspeciality Hospital, India

Abstract

Cancer and Cardiovascular Diseases (CVDs) are the 2 most common causes of death globally, accounting for two-thirds of all disease-related mortality, and they frequently coexist. Cardiovascular disease is the leading cause of death in cancer survivors, largely attributable to exposure to chemotherapeutic agents, radiotherapy, and immunomodulatory therapies used to treat patients with cancer. We present a case of middle aged female with cervical cancer with acute coronary syndrome managed by Percutaneous Coronary Intervention (PCI).

Keywords: Complex high risk indicated PCI (CHIP); PCI (Percutaneous coronary intervention); Acute coronary syndrome (ACS); CVD'S (Cardiovascular disease); CAG (Coronary angiography)

Introduction

Cancer and Cardiovascular Diseases (CVDs) are the 2 most common causes of death globally, accounting for two-thirds of all disease-related mortality, and they frequently coexist. Cardiovascular disease is the leading cause of death in cancer survivors, largely attributable to exposure to chemotherapeutic agents, radiotherapy, and immunomodulatory therapies used to treat patients with cancer. Treatment should be initiated early as these patients often are not in a terminal state when such CAD develops. The choice of optimal revascularization strategy by either a cardiac surgical procedure or Percutaneous Coronary Intervention (PCI) in such patients is often complex and will depend on indication as well as age, comorbidities, the complexity of CAD, bleeding risk, and overall cancer prognosis.

Case Report

A 49 year old female a known case of cervical cancer on cyclic chemotherapy (Bevacizumab and oral cyclophosphamide) presented in ER with complaints of chest pain radiating to both arms for 3 hours. On examination her vitals were stable. Her ecg showed st-t changes in chest leads and troponin was positive. Coronary Angiography (CAG) (Figure 1) revealed Lt Main osteal dissection with thrombus and double vessel disease (osteal LCX 80%, mid RCA 80% stenosis). High Risk PTCA to Left Main bifurcation and RCA done using 3 drug eluting stents (Figure 2) with good end result.

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***Corresponding author:** Punish Sadana, Associate Director Cardiology, Max Superspeciality hospital, Dehradun, India, Tel: +91 8171517788

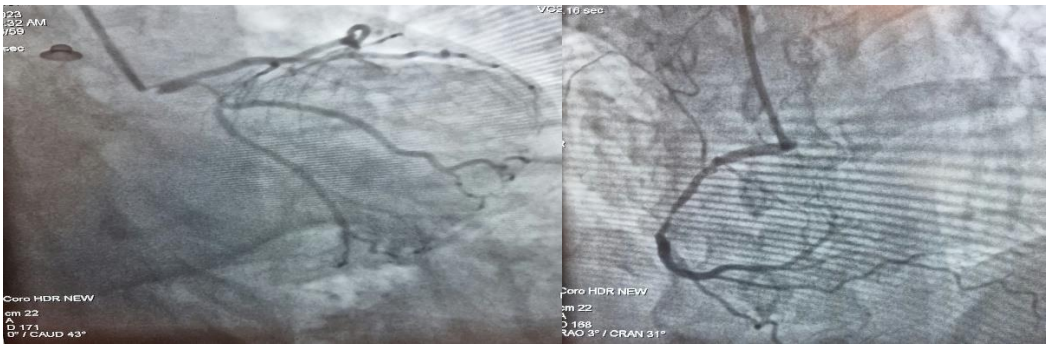

Figure 1: CAG

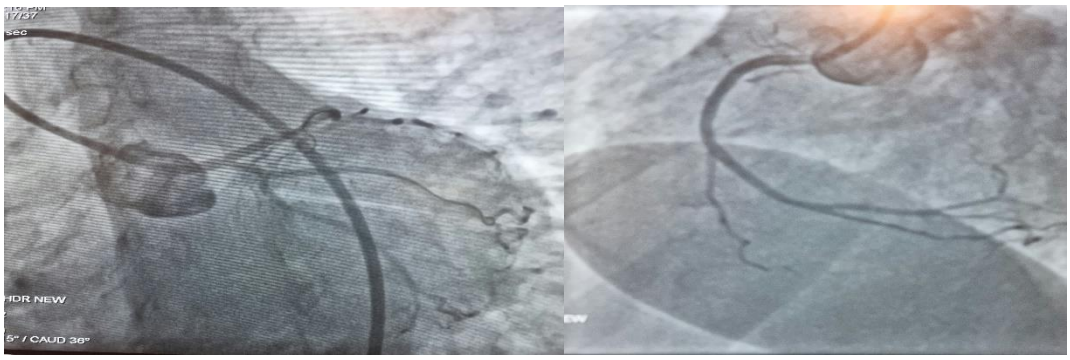

Figure 2: Post PTCA

Discussion

Cancer and Cardiovascular Diseases (CVDs) are the 2 most common causes of death globally, accounting for two-thirds of all disease-related mortality, and they frequently coexist. More than 40% of patients with lung cancer, 30% with hematologic malignancies, 20% with breast cancer, and 25% with colon cancer have prevalent CVD.2 Cardiovascular disease is the leading cause of death in cancer survivors, largely attributable to exposure to chemotherapeutic agents, radiotherapy, and immunomodulatory therapies used to treat patients with cancer, along with the emergence of new cardiovascular risk factors later in life. Cardiac metastases can cause CAD *via* tumor emboli, extrinsic compression, or ostial obstruction; in these patients the diagnosis of CAD as a result of cardiac metastases often is not made until death. The course of these patients usually is fulminant. Tumor-associated coagulation disorders and non-bacterial thrombotic endocarditis can cause coronary thromboemboli; treatment should be initiated early as these patients often are not in a terminal state when such CAD develops. Lipid-lowering therapy may prevent post-radiotherapy atherogenesis in high risk individuals. Chemotherapy (acting directly or synergistically with radiotherapy) has caused angina and myocardial infarction within hours to days after the infusion of agents both classically cardiotoxic as well as others. Bevacizumab is associated with hypertension, CHF and arterial thromboembolic events. Combination treatment with bevacizumab and chemotherapy is associated with an increased risk of arterial thromboembolism (myocardial and cerebrovascular events). The responsible underlying mechanism remains unclear. It is well known that the characteristic feature of any ATE is the instability of atherosclerotic plaques and the associated activation of platelets. Bevacizumab might reduce anti-inflammatory effects of chronic VEGF exposure, leading to increased inflammation and atherosclerotic instability, and to subsequent plaque rupture and thrombus formation. Additionally, VEGF is important for the proliferation and repair of endothelial cells. Therefore, anti-VEGF therapy may decrease the

regenerative capacity of endothelial cells in response to trauma, leading to endothelial cell dysfunction and exposing subendothelial collagen. As a result of subendothelial collagen exposure, the tissue factor is activated, increasing the risk of thrombosis. Finally, anti-VEGF therapy causes a reduction in nitric oxide and prostacyclin, as well as an increase in blood viscosity *via* the overproduction of erythropoietin, all of which comprise predisposing factors for increased risk of thromboembolic events. The choice of optimal revascularization strategy by either a cardiac surgical procedure or Percutaneous Coronary Intervention (PCI) in such patients is often complex and will depend on indication as well as age, comorbidities, the complexity of CAD, bleeding risk, and overall cancer prognosis. Yousif et al., in their prospective study, reported a higher all-cause mortality rate at 12 months, 30.3% in cancer *vs.* 11.9% in non-cancer patients, $p < 0.0001$, along with a higher incidence of net adverse clinical events, 33.9% in cancer patients *vs.* 19.8% in non-cancer patients, $p < 0.001$. Mrtozek et al. showed that troponin-positive ACS (HR 2.365 [1.162–4.817], $p = 0.018$) was most predictive of mortality in cancer patients presenting with ACS. They also reported a 1-year all-cause mortality rate of 46% *vs.* 8% in non-cancer patients. Patients with active cancer who develop ACS have longer lengths of hospital stay (7.9 days *vs.* 5.6 days, $p < 0.001$ and increased mortality (15.4% *vs.* 7.5%, $p < 0.001$) when compared to patients without cancer. PCI in cancer patients with CAD poses unique and challenging concerns, in terms of underlying bleeding risk, associated comorbidities, frailty, and survival expectancy and so on. The number of cancer survivors has grown substantially in the last two decades, as has their life expectancy. Individualizing coronary care in cancer patients with the help of a multidisciplinary approach is needed to improve outcomes. A cancer diagnosis should not automatically prevent these patients from receiving optimal medical therapy and PCI, if otherwise indicated, as both have been shown to improve outcomes in these patients. However, a multidisciplinary approach to CAD treatment is warranted in patients with cancer. Our patient illustrates a CHIP case in a cervical cancer patient presented as ACS. A Heart team meet was done and as patient was an acute coronary syndrome case with troponin positive and high grade cervical cancer, it was decided to go for PCI. PCI was done to Left Main bifurcation using mini crush technique and RCA using 3 DES (Drug Eluting Stents).

Conclusion

Cancer and Cardiovascular Diseases (CVDs) are the 2 most common causes of death globally, accounting for two-thirds of all disease-related mortality, and they frequently coexist. Patient of malignancy may present as chronic angina or acute coronary syndrome. A cancer diagnosis should not automatically prevent these patients from receiving optimal medical therapy and PCI, if otherwise indicated, as both have been shown to improve outcomes in these patients. However, a multidisciplinary approach to CAD treatment is warranted in patients with cancer.

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