Use of Indwelling Pleural Catheter for Nivolumab Induced Recurrent Pleural Effusion

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Nivolumab, a programmed death-1 (PD-1) inhibitor, is an immune checkpoint inhibitor particularly used in the treatment of malignant melanoma. Although extremely useful they do come with significant adverse effects including recurring pericardial and pleural effusion. We present a case of recurrent nonmalignant exudative pleural effusion secondary to Nivolumab treated successfully with an indwelling pleural catheter (IPC). 49-year-old male with past medical history of malignant melanoma diagnosed in January 2019 presented to the hospital in March with shortness of breath. Chest X-ray was significant for large right sided pleural effusion with large pericardial effusion seen on echocardiography. He was started on Nivolumab in January 2019 and received two cycles prior to hospitalization. During the hospital stay patient underwent two pericardiocentesis and three thoracentesis including placement of a pericardial drain and a pigtail catheter. Pleural fluid analysis was exudative with neutrophilic predominance, negative for infection or malignancy on cytology and flow cytometry. Patient was readmitted after two weeks with severe right arm pain and was found to have reaccumulation of right sided located pleural effusion with minimal pericardial effusion. Decision was made to place an IPC and continue Nivolumab. Fluid analysis was exudative with mesothelial predominance, negative for malignancy on cytology and flow cytometry. Patient remained effusion free and IPC was removed after two months. Nivolumab is a checkpoint inhibitor which enhances host immunity against tumor cells. Nivolumab is an IgG4 antibody that targets programmed death-1 protein (PD-1) on the T-cell surface. As a group, checkpoint inhibitors have become a promising new addition to cancer therapy. The checkpoint inhibitors, specifically Nivolumab is associated with recurrent pleural and pericardial effusion. The effusions are likely secondary to the toxic effects of the drug itself on the serous membranes or pseudo-progression of the tumor. In our case, multiple fluid analysis did not show any infection or malignant cells and the effusion was thought to be related to Nivolumab. Most of the case reports report conservative management with close monitoring of the effusions and continuing Nivolumab. Some case reports suggest use of indwelling pleural catheter along with use of localized chemotherapeutic agents for malignant pleural effusion however to our knowledge use of indwelling pleural catheter has not been studied for chemotherapy-induced nonmalignant pleural effusions. Our case provides insight about the use of IPC for chemotherapy-induced recurrent pleural effusion which are nonmalignant. This prevents interruption of therapy with immune checkpoint inhibitors and might improve mortality.