

Pleural Effusion Revealing A Severe Covid 19 Infection in A Breast Cancer Patient: A Case Report

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Abstract

Cancer patients, due to their immunosuppressed state, are vulnerable to the Covid 19 infection and at large risk of developing a severe or deadly form. The management of these patients during the pandemic has been challenging. We report in this essay, the case of a breast cancer patient with a pleural effusion and the dilemma presented in the management of her cancer relapse as well as the Covid 19 infection and its complications: which one should be prioritized? We'll also discuss the issue presented in identifying the origin of the pleural effusion, as it can be either malignant or due to the Covid 19 infection.

Keywords: Covid-19, breast cancer, pleural effusion, diagnosis, prognosis.

Introduction

The outbreak of the novel coronavirus disease has emerged to be the biggest, most life threatening and stress inducing health issue the world has come across since the Spanish flue in 1918. It has now infected over ten million people across the globe, taking the lives of over five hundred thousand people, and leaving many with irreparable sequels. And to this day, it continues to wreak havoc in many countries.

The most common clinical symptoms of Covid 19 range from fever, cough, fatigue, dyspnea, ageusia, anosmia, arthralgia, myalgia, and in rare cases nausea, diarrhea and vomiting. Cancer patients also present with similar symptoms or could even be asymptomatic.

They are more likely to get infected and at large risk of Covid 19 serious events due to their immunosuppressed state, related to the cancer itself or the anti-cancer treatment they are undergoing.

In this case report, we discuss the impact a Covid 19 pneumonia has on breast cancer patients, and the challenges faced by health professionals while treating these patients.

Case report

A 67-female patient, with a history of high blood pressure treated with ACE inhibitors for about 10 years, and a recent discovery of an undocumented cardiopathy, treated by aldactone, cordarone, aspirin and digoxin for about 3 months. As well as left breast cancer for which she was treated 6 years ago, by conservative surgery, followed by chemotherapy, radiotherapy and hormone therapy. She was admitted in the emergency ward on the 3rd of June, due to a week history of deterioration of her general health condition, with intense fatigue, dyspnea and fever up to 40°C. A chest CT scan showed multiple bilateral pulmonary nodes and a bilateral pleural effusion (more abundant on the left), more in favor of a metastasis. She was then transferred to the oncology ward on the 4th of June, then on the 8th, a second chest CT scan showed typical ground glass opacities associated with crazy paving images in favor of viral pneumonia. Following a positive PCR test, the patient was admitted in the ICU on the 10th, for Sars-Cov-2 pleuropneumonia (figure 1).

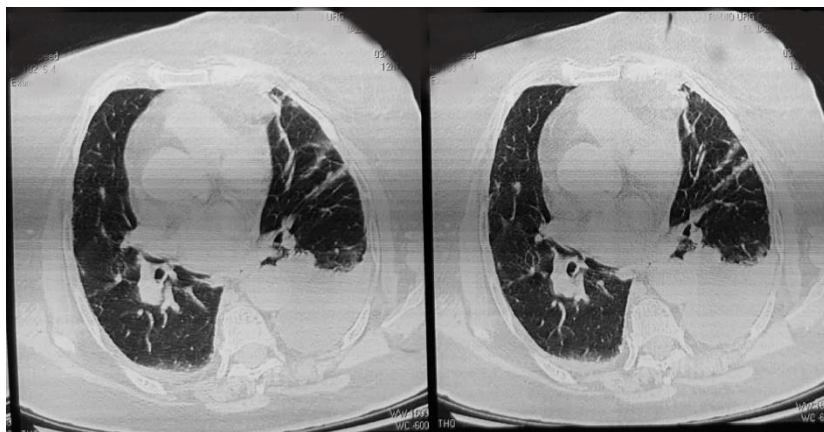


Figure 1: Chest CT scan showing, Ground glass opacities, crazy paving images, multiple pulmonary nodes, bilateral pleural effusion (more abundant on the left).

Upon admission, the medical examination revealed a conscious patient (GCS 15/15), polypneic (30 cpm) with an oxygen saturation (SpO₂) of 86% in the ambient air and 98% upon wearing a non-rebreather face mask (10 L/min), blood pressure of 170/80 mmhg, pulse of 75 bpm and a temperature of 36.5 °C.

Complete blood count showed a neutrophilic leukocytosis, white blood cells of 31750 el/mm³, neutrophils of 28420

el/mm³, lymphocyte of 1370 el/mm³, hemoglobin at 11.8 g/dl, platelets of 372000 el/mm³. Fibrinogen at 2.58 g/l, D-Dimers at 2750 mg/l, CRP of 26.4, PCT of 0.77, ferritin at 295 ng/l and troponins at 23.5 ng/l.

A CT angiography of the chest was realized and showed an acute right pulmonary artery embolism, with a Qanadli score of 25% (figure 2).

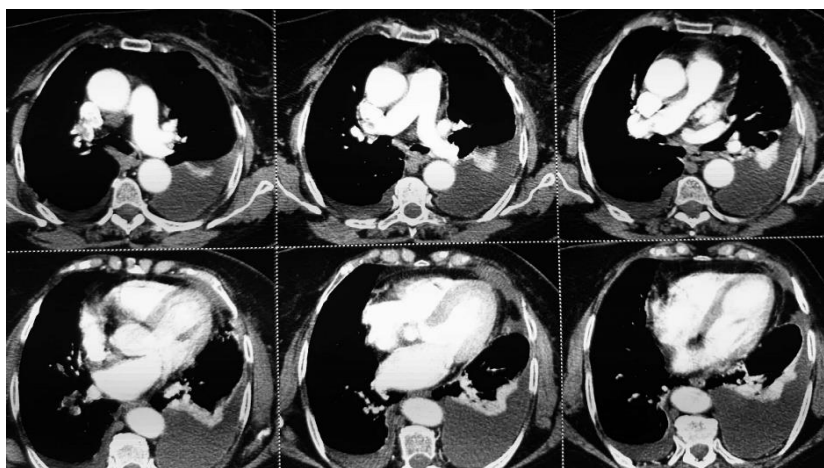


Figure 2: CT chest angiography showing a right pulmonary artery embolism.

A pre-therapeutic EKG was normal, regular sinusal rhythm of 90 bpm, no repolarization trouble and QTc at 433 mm. The echocardiography showed no abnormalities, non-dilated and non-enlarged left ventricle with normal contraction, a LVEF at 60%, no significant valvular disease, non-dilated right cavities with normal right ventricular systolic function, no signs of pulmonary hypertension or acute pulmonary heart.

Therapeutic care was based on the performance of a pleural drainage using a pigtail intercostal drain, removing 800 ml of clear yellow pleural fluid, that was sent for differential cell counts, chemical analysis, cultures, cytological examination and Sars-Cov2 PCR. The fluid examination revealed an exudate (high level of protein at 34 g/l) with a high white cells count (100% lymphocytes), with some isolated cells and clusters suspected of malignancy. The microbiological tests for detection of both anaerobic and

aerobic bacteria, mycobacteria and fungi were negative. The Sars-Cov-2 PCR came back negative.

After pleural fluid removal, dyspnea and respiratory failure progressively improved, the drain kept bringing 100 to 200 ml a day during the following 3 days, after which it was removed.

Therapeutic care was also based on oxygen therapy: non-rebreather mask at 10L/min the first day, then nasal cannula at 3L/min with an SpO₂ of 99% and then she was left in the ambient air with an SpO₂ of 97%.

The patient also received anti-coagulation (LMWH: enoxaparin 0.8 UI twice a day), anti-hypertensive (amlodipine 5mg) treatment, corticosteroid therapy, antibiotics and the association of hydroxychloroquine + azithromycin.

The patient had a favorable outcome and was declared cured of the Sars-Cov-2 infection following a negative PCR test, on the 9th day of treatment. She was then transferred to the oncology ward for further treatment of her metastatic lesions.

Discussion

Studies have shown that fragile hosts with underlying health conditions such as diabetes, high blood pressure, cardiovascular disease and COPD are more susceptible to severe Covid 19 infection. Including patients with cancer history or active cancer. The risk depends on multiple factors such as the type of cancer, its location and extent, the course of the disease, the contribution of other comorbidities, the patient's age and most importantly the different treatment strategies undergone [1]. Undoubtedly, cancer directed therapies such as chemotherapy and surgery have been known to cause a systemic immunosuppressive state which leaves patients vulnerable to various viral infections. Another factor is the time since last therapy. Zhang et al. studied the outcomes of cancer patients with COVID-19 on active anticancer therapy and reported a higher likelihood of experiencing severe events in those who received therapy in the preceding 14 days of Covid 19 diagnosis [2].

In France, the research group of Nice-St Paul de Vence, in collaboration with the Collège Nationale des Gynécologues et Obstétriciens Français (CNGOF), have developed, in early April, guidelines to assist healthcare facilities in the management of breast cancer patients during this pandemic [3]. Focusing mainly on the fact that breast cancer patients must be protected from contracting the infection, by respecting the general hygiene recommendations, wearing masks, and reducing hospital visits. Concerning the diagnosis, highly suspect lesions such as ACR5, ACR4 and ACR3 must be explored, whereas less suspect lesions will be explored after the pandemic. Also, regarding the treatment of the original breast tumor, relapse or metastasis, they came to the conclusion that one must strongly consider delaying anticancer therapy in patients with stable cancer. However, for aggressive cancers, it is preferable to have a risk-benefit assessment and proceed with cancer treatment if benefits outweigh risks [4]. Still, evidence is lacking and clinical decisions should be individualized to consider factors such as the risk of cancer relapse if treatment is modified, the number of cycles already completed, and the patient's tolerance of therapy.

Coming back to our patient, she presented with dyspnea and fever, prompting us to realize a chest CT scan, showing both signs of Covid 19 infection as well as pulmonary metastasis. It also showed an abundant bilateral effusion, that could be due to either the Covid 19 infection, for cases of pleural effusion in Covid 19 have been published [5], but it also could be secondary to the breast cancer which was more usual and that was the case with our patient.

Malignant pleural effusion (MPE) commonly occurs in patients with metastatic breast cancer and is often the first evidence of recurrence. It is usually one-sided, ipsilateral

and is a bad prognostic sign. It can manifest years after the initial tumor. The diagnosis is mainly based on chest radiographs, thoracic CT scans, pleural examination, and pleural biopsy. Studies have shown that MPE is an exudate in 95% of cases, commonly lymphocytic and cytology is positive in about 60% after the first diagnostic aspiration [6].

Whereas Covid 19 related pleural effusion is roughly rare, only two or three cases were reported worldwide. The first case that was published found a small bilateral pleural effusion. Cell count examination revealed predominant mononucleated cells (92%), chemical parameters showed an exudate, cytologic analysis documented reactive mesothelial cells and lymphocytes. The Sars-Cov-2 PCR test revealed the presence of the virus at a moderate viral load [5].

That is to highlight the fact that pleural effusion can be misleading to health professionals during this pandemic. It is not a common finding in Covid 19 infection. However, clinicians should be aware of this potential disease localization.

Our breast cancer patient had a rather rapid improvement, although she had metastatic pulmonary nodes, malignant pleural effusion, an acute right pulmonary artery embolism, and multiple other comorbidities. We tried to explain this by the fact that she was less vulnerable to the virus because her last chemotherapy cure dates back to November 2014, and so she wasn't as fragile as other cancer patients.

However, not all cancer patients had the same positive outcome. They are still at increased risk of developing severe or lethal Covid 19 complications. That's why they require timely diagnosis, evaluation, treatment and follow-up.

Conclusion

Covid 19 disease affects all, but especially the most vulnerable. Breast cancer patients, given their poor health state and the aggressive nature of their underlying disease, have been told to stay on lockdown during this pandemic because, if infected, they are more likely to get clinically severe events. That's why we should try to prevent them from contracting the infection and adjust the cancer therapy in patients with Covid 19. Evidence is lacking on whether we should continue, change or withhold their cancer treatment, but generally we continue the treatment if necessary. Pleural effusion is a frequent manifestation of pleural metastasis in breast cancer patients, but it may also be a sign of a Covid 19 infection, one must distinguish between the two.

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