Recurrent lung abscesses during chemotherapy in patient with limited stage small cell lung cancer: A case report and review

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Fifty-eight Y.O. lady was diagnosed with limited stage SCLC in our institute in November 2013. She started initially on EP chemotherapy. On day 12 of cycle 2, the patient complained of Fever, excessive cough. CT thorax showed newly developed pulmonary abscess that confirmed histologically. She was kept in with IV (intravenous) antibiotics, with subsequent improvement of her condition. Then CCRT was initiated with cycle 3 EP. On day 6 of cycle 3, she developed fatigue, poor general condition, high fever, and, cough. CT Thorax showed new lung abscess in the ligula. Sputum culture showed klebsiella pneumonia. She was treated by IV antibiotic for 10 days. Her condition improved thereafter and she was returned back to CCRT with Cycle 4 EP. Currently, she finished her treatment protocol with no further complication related to treatment protocol. Discussion: Many reasons may explain the development of lung abscess in non-neutropenic patient including chemotherapy side effect, underlying chest condition, and relatively large primary tumor size.

Keywords: Lung cancer, tumor, Cisplatin, chemotherapy, CT thorax

INTRODUCTION

Small cell lung cancer (SCLC) represents 14% of all lung cancer cases. Limited stage disease represents nearly one-third of all SCLC patients. (Movsas et al., 2012) (Fried et al., 2004)

The current standard of care for limited stage SCLC is concurrent chemoradiotherapy (CCRT), with the use of EP (etoposide, cisplatin) chemotherapy. Further, radiotherapy should to be added as early as possible. (Fried et al., 2004)

The current treatment protocol is tolerated well and is associated with few side effects. Cisplatin is mainly associated with neutropenia, nausea, vomiting, nephrotoxicity, and, or electrolyte imbalance. While, etoposide is mainly associated with neutropenia, thrombocytopenia, nausea, vomiting, and, or diarrhea. Radiotherapy side effects includes skin injuries (erythema, drying and peeling of the cutaneous epithelium), nausea, vomiting, heart burn, and, or diarrhea Radiation pneumonitis and fibrosis typically occur 1-3 months after finish of radiotherapy. (Magaña and Crowell, 2003, Surendiran et al., 2010) (Medscape drug references., 2011).

The current case report discusses about rare complication that happened during chemotherapy treatment.

CASE DESCRIPTION

Fifty-eight Y.O. lady, presented to our institute in November 2013 by worsen SOB, progressive cough, and wheezes. Past medical history was positive for hypertension, and hypercholesterolemia. She was on atenolol, rosuvastatin, and calcichew D3 tablets. Social history was positive for smoking of 40 pack/year. On examination, her performance state was ECOG 1, chest examination showed diminished breath sounds both lower zones, with occasional wheezes. Abdominal exam was unremarkable. No lower limbs edema. Chest X-Ray (CXR) showed enlargement of the right lung hilum and superior mediastinum. CT (computerized tomography) thorax (figure 1) showed right perihilar mass with extension into infracarinal, precarinal aspects of the mediastinum and encasement of right
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Figure 1. The CT thorax imaging at diagnosis

Figure 2. CT thorax imaging after cycle 2 EP showing the lung abscess

Osman

pulmonary artery and distal aspect of right main bronchus. She underwent diagnostic EBUS FNAB (endobronchial ultrasound fine needle aspiration biopsy), which showed SCLC, +ve for chromogranin, CD56 (NCAM). Staging PET (positron emission tomography) scan showed right hilar mass (5.7 cm) surrounding the carina with mediastinal lymphadenopathy and post obstructive inflammatory changes. CT brain was negative for metastases. Radiological stage was T3 N3 M0 (limited stage SCLC).

Patient was planned for concurrent chemoradiotherapy (CCRT), and she started initially on chemotherapy protocol EP (Etoposide 100 mg/m2 day 1-3 and Cisplatin 75mg/m2 day1), with referral to radiotherapy specialist to consider her for concurrent radiotherapy by Cycle 2-3.

Cycle1 EP was given without any complication. Subsequently, Cycle 2 was given without any delay or dose modification. On day 12 of cycle 2, the patient presented to the emergency room, complaining of fever, and excessive cough. Her leucocyte count was 5,000 and neutrophil count was 2,400. CXR showed possible lung abscess in the right upper lobe. We admitted her to the hospital by chest infection, with query lung abscess. We started her on IV (intravenous) antibiotic in the form of Tazobactam, pipracillin. Although the CT thorax showed significant response of the right hilar mass to chemotherapy, there was newly developed right upper lobe abscess (Figure 2).

Subsequently, CT guided aspiration was done, and confirmed inflammatory cells with no malignant cells. TB culture was negative, as well as the fungal culture. Condition was improved thereafter and she was discharged.
Then she was started on CCRT, with cycle 3 EP without delay, or dose modification. On day 6 of cycle 3, she developed fatigue, poor general condition, high fever, productive cough and neutrophil count was 950. She was admitted by neutropenic sepsis. Following 1 shot of short acting GCSF (granulocyte colony stimulating factor), neutropenia was recovered. CXR showed new round opacity with the appearance of air level fluid in the lingula (suspecting new pulmonary abscess). Sputum culture showed Klebsiella pneumonia. CT Thorax (figure 3) showed further improvement of the right hilar mass as well as the prior lung abscess with development of new abscess in the lingula.

She started on IV tazobactam, pipracillin, and gentamycin for 2 days that was changed to IV meropenem, and gentamycin based on the antibiotic sensitivity of klebsiella pneumonia for 10 days. Subsequently, her condition improved few days after admission, and repeated CXR showed improvement of the new lung abscess. Then, she was discharged on PO clindamycin, sodium fucidate (as per klebsiella pneumonia antibiotic sensitivity) for total of 6 weeks. We resumed her radiotherapy after discharge. Cycle 4 EP was given without any delay or dose modification, with prophylactic long acting GCSF. Currently, she finished her treatment protocol without further complications related to treatment.

DISCUSSION

Many lung conditions can predispose to development of lung abscess including COPD (chronic obstructive pulmonary disease), bronchiectasis, TB, lung cancer, and aspiration pneumonia. The most common causative organisms include staphylococcus aureus, klebsiella pneumonia, pseudomonas aerogenosa, haemophilus influenza, and anaerobes. The differential diagnosis includes cavitating carcinoma, TB, fungal infection, and wegener granulomatosis. Most cases respond well to antibiotic therapy and the prognosis is usually excellent unless there is a debilitating underlying condition. Mortality from lung abscess is around 5%. (Hirshberg et al., 1999) (Moreira et al., 2006)

Few studies referred to the development of lung abscess in patients with SCLC. In the study of, Phernambucq et al. (2012), 7 (8%) out of 87 lung cancer patients who were treated by CCRT developed lung abscesses. All of the patients developed lung abscess in mean time of 98 days from the start of chemotherapy (Range: 35 – 144 days). Interestingly 1 patient developed lung abscess 35 days after start of chemotherapy. The authors attributed lung abscess development to leucopenia, and relatively large tumor size (≥ 8cm). (Phernambucq et al. (2012)

In another study by (Hansen et al., 1986), showed development of lung abscess in 4% of their SCLC patient group treated by chemotherapy. Nearly 65% of them developed abscess in the first month of chemotherapy. The authors further observed those who had lung abscess had nearly the same survival as those who didn’t develop abscess. They concluded that lung abscess per se in patients with SCCL should not prevent the use of combination chemotherapy. (Hansen et al. (1986)

From FDA reports, among 35,593 reported side effects to cisplatin between 2004 and 2012, 34 patients (0.10%) reported development of lung abscess. 80% of them were > 50 y.o., and 9% had SCLC. 60% of the patients developed lung abscess in their 1st. 2 months of cisplatin treatment. The reported cisplatin combinations included navelbine (38.24%), gemcitabine (17.65%), etoposide (17.65%), sorafenib (14.71%), and dexamethasone (11.76%). From etoposide reports, among 17,499 reported side effects in the same period, 23 patients (0.13%) reported lung abscess. 72% of them were >50 y.o., and 47% had SCLC. 88% of the patients developed lung abscess in their 1st. month of etoposide treatment. The reported etoposide combinations were Carboplatin (43.48%), Naproxen (34.78%), Cisplatin (26.09%), Pantoprazole sodium (26.09%), and Theophylline (26.09%). From chest radiotherapy reports, 1 out of 39 patients reported development of lung abscess (2.5%). The diagnosis of that patient was malignant pleural mesothelioma. (Justice, 2013)

CONCLUSION

From the current case report, it was concluded that lung abscess is a rare complication that may occur during SCLC treatment. Many reasons may explain its development in non-neutropenic patients including chemotherapy side effect, underlying chest condition, relatively large primary tumor size.
Conflict of interest

I, the corresponding author discloses any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within that could inappropriately influence (bias) the work.

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