

Recurrent Lung Abscesses during Chemotherapy in Non-neutropenic Patient with Limited Stage Small Cell Lung Cancer: A Case Report and Review

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Abstract Background: Small cell lung cancer (SCLC) represents 14% of all lung cancer cases. The current standard of care for limited stage SCLC is the chemotherapy combination of EP (etoposide, cisplatin) with concomitant radiotherapy. Treatment protocol is tolerated well and is associated with few side effects. **Case Description:** 58 y.o. lady diagnosed to have limited stage SCLC in our institute in November 2013. She was planned for concomitant chemoradiotherapy (CCRT). She started initially on chemotherapy protocol EP. On day 12 of cycle 2, the patient complained of Fever, excessive cough. CT thorax showed newly developed peripherally situated pulmonary abscess. She was kept in with IV antibiotics, and her condition was improved thereafter. Then she was started on CCRT, with cycle 3 EP. On day 6 of her cycle 3, she developed fatigue, poor general condition, high fever, cough and neutropenia. She was admitted as neutropenic sepsis, with improvement of neutropenia after only 1 shot of short acting GCSF. Sputum culture showed Klebsiella pneumonia. CT Thorax showed new lung abscess in the Left ligula. She was treated by IV antibiotic for 10 days. Her condition was improving thereafter and she was returned back to radiotherapy, as well as Cycle 4 EP. Currently, she finished her treatment since 1 month with no complication related to treatment protocol. **Discussion:** Although few, studies attributed the reason for lung abscess development to leuconeutropenia in some patients, and to relatively large primary tumour size in other patients. **Conclusion:** Many reasons may explain the development of lung abscess in non-neutropenic patient including chemotherapy side effect, underlying chest condition, and relatively large primary tumour size.

Keywords: abscess, cisplatin, etoposide, recurrent, fever,

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1. Introduction

Small cell lung cancer (SCLC) represents 14% of all lung cancer cases. Limited stage patients represent nearly one-third of all SCLC patients [1,2].

The current standard of care for limited stage SCLC is concomitant chemoradiotherapy (CCRT), with the use of chemotherapy combination of EP (etoposide, cisplatin), with initiation of radiotherapy as early as possible [2].

The previous treatment modality is tolerated well and is associated with few side effects.

The following Table 1 shows the most commonly reported side effects of the chemotherapy protocol and their frequencies: [3,4]

Radiotherapy early side effects include skin injuries (erythema, drying and peeling of the cutaneous epithelium), nausea, vomiting, heart burn, and diarrhea. Radiation pneumonitis and fibrosis occur 1-3 months after finish of radiotherapy course [5].

The current case report discusses about uncommon complication that recurred during chemotherapy treatment.

Table 1.

Cisplatin		Etoposide		
Side effect	Frequency	Side effect	Frequency	
Nausea	76-100%	Leukopenia	60-91%	
Vomiting	76-100%	Nausea/Vomiting	30-40%	
Nephrotoxicity	28-36%	Thrombocytopenia	28-41%	
Ototoxicity	31%	Alopecia	50-90%	
Myelosuppression	25-30%	Anorexia	13%	
Anaphylaxis	1-20%	Diarrhea	13%	
Alopecia	20-50%	Pancytopenia	7%	
Electrolyte changes	4-10% Frequency Not defined	Stomatitis	6%	
Encephalopathy		Type hypersensitivity ¹	2%	
Seizure		Orthostatic hypotension	1-2%	
Peripheral neuropathy (dose/duration dependent)		Peripheral neuropathy	1%	
Diarrhea		Frequency not defined	Malaise	Frequency not defined
Cerebral herniation			Shivering	
Hyperuricemia			Asthemia	
Hepatotoxicity			Fever	
Local tissue irritation			Mucous membrane inflammation	
			Hyperuricemia	
		Local soft tissue toxicity		

2. Case Description

58 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 1 pack/day for 40 years. On examination, her performance state was 1, chest examination showed diminished breath sounds both lower zones, with occasional wheezes. Abdominal exam was unremarkable. No lower limbs oedema.

Chest X-Ray showed enlargement of the right lung hilum and superior mediastinum. CT thorax showed right perihilar mass with extension into infracarinal, precarinal aspects of the mediastinum and Encasement of right pulmonary artery and distal aspect of right main bronchus. She underwent diagnostic EBUS FNA, which showed SCLC, +ve for chromogranin, CD56 (NCAM). Staging PET 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. So, she was diagnosed as Limited stage SCLC.

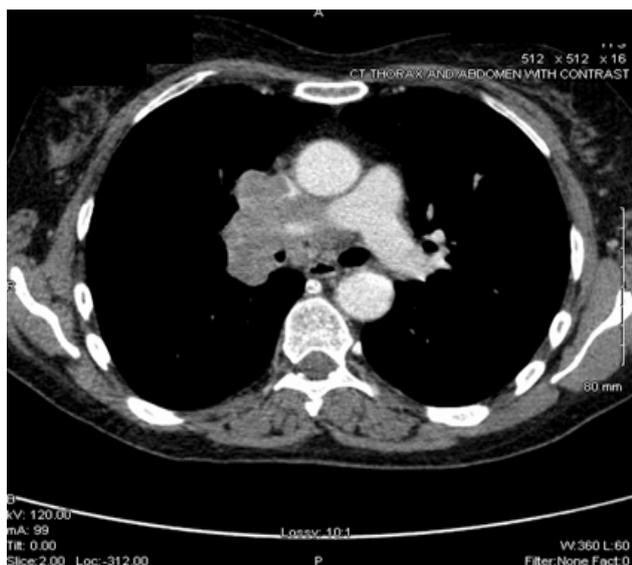


Figure 1. The CT thorax imaging at diagnosis

The patient was planned for concomitant chemoradiotherapy (CCRT), and she started initially on chemotherapy protocol EP (Etoposide 100 mg/m² day 1-3 and Cisplatin 75mg/m² day1), and a referral for radiotherapy was made to start radiotherapy by 2nd. Or 3rd. Cycles at maximum.

Cycle1 EP was given without any complication. As well Cycle 2 was given without any acute complications. On day 12 of cycle 2, patient complained of Fever, excessive cough, her WBC was 5.000 and neutrophil count was 2.400. CXR showed possible lung abscess in the Right upper lobe. We admitted her in the hospital by chest infection, query lung abscess; and we started her on antibiotic in the form of IV Tazobactam, piperacillin. CT thorax showed development of a peripherally situated pulmonary abscess with significant response of the right hilar mass to chemotherapy.

CT guided aspiration was done and confirmed inflammatory cells with no malignant cells. TB culture was

negative, as well as fungal culture was also negative. Condition was improved thereafter and she was discharged.

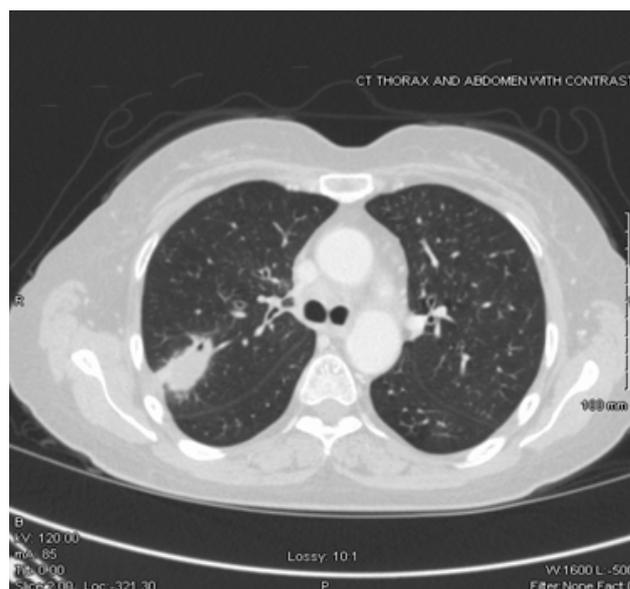


Figure 2. CT thorax imaging after cycle 2 EP showing the lung abscess

Then she was started on CCRT, with cycle 3 EP. On day 6 of cycle 3, she developed fatigue, poor general condition, high fever, productive cough and neutrophil count was 950. She was admitted as neutropenic sepsis, neutropenia recovered after only 1 shot of short acting GCSF. Sputum culture showed Klebsiella pneumonia. Chest X-Ray showed new round opacity with the appearance of air level fluid in the left lingula (suspecting new pulmonary abscess), with patchy lower right lung pneumonia. The previous pulmonary abscess was smaller. CT Thorax showed new lung abscess in the Left lingula, and the right hilar mass was slightly smaller when compared with the previous CT, as well as the prior lung abscess in the right upper lobe also improved.



Figure 3. CT thorax imaging after 3 cycles EP

She was treated by IV antibiotic in the form of Meropenem, and Gentamycin as per klebsiella pneumonia antibiotic sensitivity for 10 days, followed by PO clindamycin, sodium fucidate for 6 weeks. Her symptoms improved few days after admission, CXR repeated 1 week following admission, and showed improvement of the new

lung abscess. We resumed her radiotherapy after 10 days of admission. Cycle 4 EP was given without any delay (after 21 days of cycle 3) with prophylactic long acting GCSF. Currently, she finished her treatment since 1 month with no complication related to treatment protocol.

3. Discussion

Many lung conditions can predispose to development of lung abscess including COPD, bronchiectasis, TB, lung cancer, and aspiration pneumonia. The most common causative organisms include anaerobe bacteria, staphylococcus aureus, Klebsiella pneumonia, pseudomonas aerogenosa, and Haemophilus influenza. The differential diagnosis includes cavitating carcinoma, TB, fungal infection, and Wegener granulomatosis. Most cases respond well to antibiotic and prognosis is usually excellent unless there is a debilitating underlying condition. Mortality from lung abscess alone is around 5% and is improving [6,7].

The occurrence of lung abscess in patients with SCLC during chemotherapy had been shown in few studies. One of these, is the study by Phernambucq et al., 2012. They showed lung abscess occurrence in 7 patients (8%) out of 87 lung cancer patients who were treated by CCRT. The study showed that, all of these 7 patients developed lung abscess in mean time of 98 days from the start of chemotherapy (Range: 35 – 144 days). Interestingly that, 1 patient developed lung abscess 35 days after start of chemotherapy. The authors of that study attributed the reason for lung abscess development in part to leucopenia, and in others to relatively large primary tumour size in their patients (more than or equal to 8cm) [8].

In another study by Hansen et al., 1986, they 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 found that, 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 [9].

From FDA reports, it was found that among 35,593 patients reported to the FDA in period from 2004 to 2012, to have side effects while taking Cisplatin, only 34 (0.10%) reported to have Lung Abscess. 60% of the patients were in their first 2 months of treatment. 80% of the patients were > 50 years. 20.5% of these patients had NSCLC (non small cell lung cancer), 9% had SCLC. The reported cisplatin combinations included navelbine (38.24%), gemcitabine (17.65%), etoposide (17.65%), sorafenib (14.71%), and dexamethasone (11.76%).

For etoposide reports, among 17,499 patients reported side effects to the FDA in the same period from 2004 to 2012, 23 patients (0.13%) reported development of Lung Abscess. 88% of the patients were in their 1st. month of etoposide treatment. 72% of the patients were >50 years old. 47% of the patients had SCLC. The reported

etoposide combinations were Carboplatin (43.48%), Naproxen (34.78%), Cisplatin (26.09%), Pantoprazole sodium (26.09%), and Theophylline (26.09%).

For radiotherapy, for the same period, 1 individual out of 39 taking RADIATION THERAPY reported LUNG ABSCESS to the FDA (2.5%). The diagnosis of that patient was malignant pleural mesothelioma [10].

4. Conclusion

From the current case report, it can be concluded that lung abscess is an uncommon complication that may occur during SCLC chemotherapy treatment. Many reasons may explain its occurrence including chemotherapy side effect, underlying chest condition, relatively large primary tumour size, as well as neutropenia.

Conflict of Interest Statement

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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