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Squamous Cell Lung Cancer with Brain Metastasis: A Case Report

Anak Agung Bagus Bramardipa[1], Anak Agung Gde Upeksha[2]

[1]Internship Doctor at Pulmonology and Respiratory Medicine Departement, Bali Mandara Hospital, Bali, Indonesia
Email: *bramardipa[at]gmail.com*

[2]Pulmonologist at Pulmonology and Respiratory Medicine Departement, Bali Mandara Hospital, Bali, Indonesia
Email: *upekshagde[at]gmail.com*

Abstract: ***Globally, lung cancer contribute up to 11.6% of all the total cancer cases and cover around 18.4% of cancer deaths. Lung cancer are classified into two major groups, which is small-cell lung cancer and non-small cell lung cancer (NSCLC). Squamous cell lung cancer is one of subtype of NSCLC originated from squamous cell lining the airways. Brain is one of the organ that often affected from distant metastasis along with bone, liver, and adrenal gland.Case:A 60s years-old male patient come to polyclinic with chief complaint dry cough and weakness on left arm. Heterogenous enhanced irregular speculated mass with central necrotic 7.8x7.8x7.7 cm in left lung and rim enhanced iregulermass4.9x4.0x3.6 cm on right temporoparietalis were found from thorax and head CT-scan.***

Keyword: Cancer, Non-Small Cell Lung Cancer, Brain Metastasis

1. Introduction

As the increased of total smokers each years, lung cancer remains become the most causes of cancer death, lung cancer is the most common cancer and also most common cause of cancer death in men and women combined as it is the third cause common cancer in woman and second most common cause of cancer death. In 2018, there are around 2.09 million new cases of lung cancer globally, making it as 11.6% of total cancer cases with covers around 1.76 million of deaths (about 18.4% of total cancer death).[1] Lung cancer incidences are often correlated to smokers, in area where tobacco smoking rate is low, non-tobacco factors such as recurrent infection, genetic, inhaled hazard, vehicles pollution and cooking are thought to play the roles as lung cancer trigger.[1,2,3]

Lung cancer are classified into two major groups, which is small-cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC).[2] Small cell carcinoma counts as 15% of total lung cancer and non-small cell lung cancer contributed 85% and divided into three subcategorized, adenocarcinoma (40%), squamous cell carcinoma (25-30%) and large cell carcinoma (10-15%).[4,5]Squamous cell carcinoma of lung, or squamous cell lung cancer is the second most common lung cancer, estimated around 20% of lung cancer cases in US and was the common subtype in men, this cancer located mostly as a central lesions and originates from squamous cell lining the airways, even though peripheral occurrence may be found[2], there are three subtype of Squamous cell carcinoma including basaloid, keratinizing and non-keratinizing which doesn't have a significance different of prognosis.[4,6]

Non-small cell lung cancer including squamous lung cancer often diagnosed in advance stage disease because it barely display significance symptoms, patient may experiences cough, chest pain, dyspnea and hemoptysis. Other sign that may presented is paraneoplastic syndrome.[7] Since the symptoms presents in late stage, the use of low dose thorax CT-scan modality for screening in high risk patient is beneficial. To confirm diagnosis, histological examination from biopsy sample is needed.[7]Around 40% of lung cancer patient diagnosed with a present of metastatic spread, distant metastasis could be found in many organ, one of many metastasis placed which gives a significant problem and challenges is brain metastasis.[8]

Due to their symptoms often occurred in late stage and lack of targeted therapies, the prognosis of Squamous Cell Lung Cancer is often poor.[9]This case report will discuss a Squamous Cell Lung Cancer with brain metastases in a 60s-years old men

2. Case Report

A 60s years-old male patient come to polyclinic with chief complaint dry cough since three months prior admission, dry cough accompanied by chest tightness and sensation of pain in his left chest wall every time he coughed,he also complained loss of appetite and weight loss around five kilogram since he felt the chief complaints. Two weeks before admission the symptoms worsened and his left hand started to feel numb and weak, he then went to secondary-level hospital and then referred to Tertiary Hospital with suspected Lung Mass. There are no history of carcinoma in family and past history including chronic lung disease were denied, patient are an active smoker who have been smoking since 40 years ago. On the examination, patient was compos mentis with respiratory rate 24 times per minutes, heart rate 115 times per minutes and blood pressure was 128/61 mmHg, patient is 175cm and weighted 57kg (BMI 18.6 kg/m^2). Patient live with his family and still able to do daily activities despite his symptomatic

cough and chest wall pain (Karnofsky score 80, Performnce status 1).

A thorax CT scan (**Figure 1**.) and head CT scan (**Figure 2**.) with contrast were done.Heterogenous enhanced irregular speculated mass with central necrotic 7.8x7.8x7.7 cm sized and surrounded by pneumonitis reaction on the apicoposterior of the lung were shown from Thorax CT-Scan, the mass was adhered to the mediastinum medial and posterior pleura, Multiple enhanced nodul were spread around the lung and multiple suspicious lymphadenopathy were found in paratracheal, subcarina, mediastinum and left parahilar.

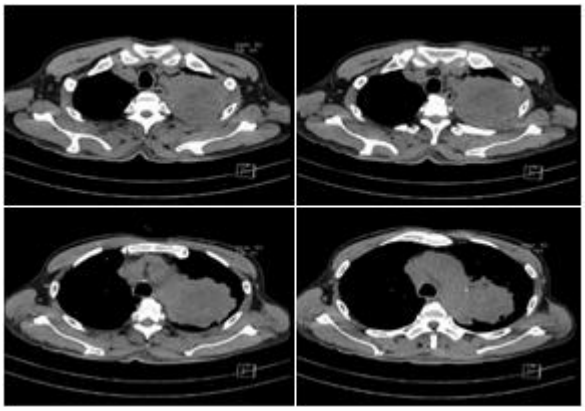

Figure 1: Thorax CT Scan

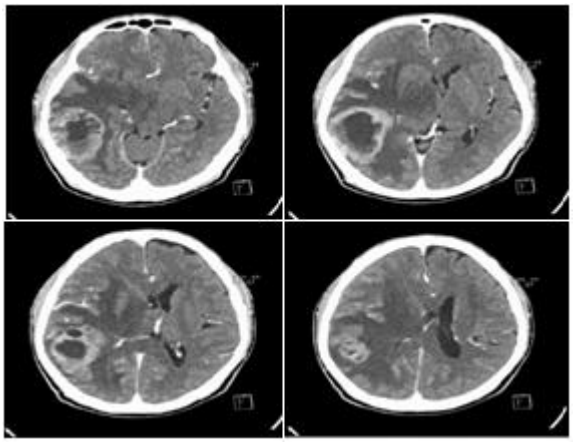

Figure 2: Head CT Scan

From the head CT scan, rim enhanced iregulerintraaxial mass 4.9 x 4.0 x 3.6 cm sized were found on right temporoparietalis lobes suggesting an intracranial metastasis process, along with thorax CT scan matched the staging T4N3M1b IVA.

Patient then hospitalized for neurological management and undergo trans-thoracal needle biopsy (TTNB) after that. From the cytomorphology result gained from TTNB sample, Non-small cell carcinoma suggesting to Squamous Cell Carcinoma were found. (**Figure 3**.)

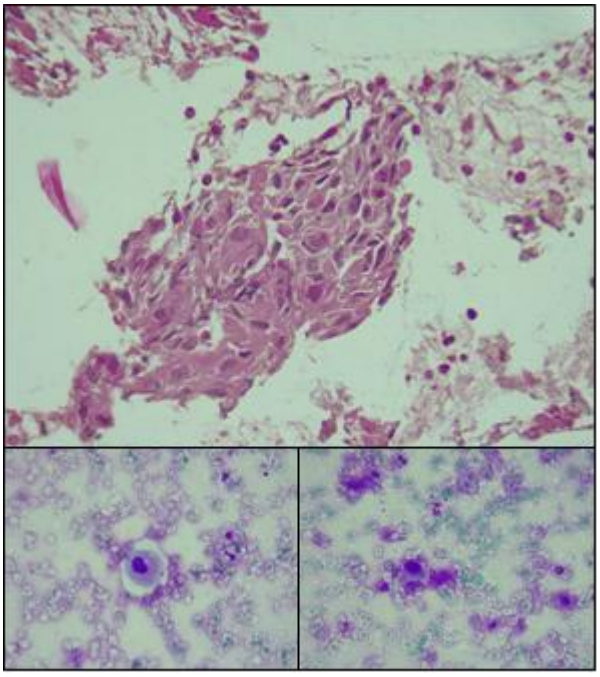

Figure 3: TTNB sample smear

Patient then referred to quaternary hospital to seek chemotherapy and was prescribed supportive medicine to reduce symptoms.

3. Discussion

Lung cancer barely shows any symptoms in early stage, and usually come in late stage where half of patient that newly diagnosed with lung cancer have already developed metastatic spread. Cough, breathless, sensation of pain in chest, haemoptysis or weight loss are usually present in late stage, in addition of symptom related to metastatic sites.[10,11] Serial diagnostic procedure in patient with suspected lung cancer will began started with imaging techniques, after the location of lesion were found, biopsy will be done to obtain sample for pathological diagnosis.[10]Brain metastasis is common in lung cancer, given by that facts, head CT-scan should be done in patient with CNS symptoms.[10]

Lung cancer arises from so many factor including microenvironmental changes that alter the balance of cell division and death, cell autonomous and immune recognition avoidance. This regulatory failure is caused by damage that induced by pollutant or tobacco smoke exposure, chronic exposure to tobacco smoke will trigger morphological changes of airway epithelium from basal cell, slowly become hyperplasia to metaplasia to carcinoma in situ and finally carcinoma. This change mostly seen in squamous cell lung cancer.[10] Squamous cell lung cancer is originated squamous cell that lining the airways, by that, this cancer mostly located in the central.[2]

The treatment of NSCLC including Squamous Cell Lung Cancer depending on tumor staging and patient condition (comorbidities and performance score). Recently, AJCC 8th

edition was validate as an approach for lung cancer staging (**Table 1**).[12]Computed tomography (CT) remains the good modalities to staging lung cancer.[13]The basic structure for staging is TNM system where T is for tumor characteristic, N for nodal involvement and M for metastasis. In the case, 7.8x7.8x7.7 cm were found which account for T4, multiple suspicious lymphadenopathy in mediastinum and left parahilar also present which account for N3 and lastly rim enhanced iregulerintraaxial mass were found in right temporoparietalis lobes which account for M1b, based on the AJCC 8th edition, the staging for this patient is T4N3M1b (IVA).[14]

Management target of systemic therapy in metastatic non-small cell lung cancer is to increase the quality life of patient and reduce the cancer burden.[11] Patient with metastatic spread require systemic chemotherapy,[7]double platinum agent was the standard therapy given for advanced diseased before immunotherapy era.[7,11]

Some factors that should be considered before deciding the treatments are molecular pathology, performance score and age.[15] Based on National Comprehensive Cancer Network (NCCN) Guidelines, in squamous cell carcinoma patient with advanced or metastatic disease (NSCL-18), programmed death ligand-1 (PD-L1) is required to be tested and other molecular testing such as *EGFR* mutation, ALK, KRAS, ROS1, BRAF, RET and HER2 could be considered. [13,16]

First line therapy of squamous cell lung cancer with PD-L1 status <50% are platinum-based (cisplatin or carboplatin+paclitaxel) combined with pembrolizumab, thenpembrolizumab or necitumumab is given for the maintenance, while for patient with PD-L1 status >50%, pembrolizumab is the first line therapy. [7,11,13,15]

The platinum regiment is given for 4-6 cycles.[7]In stage IVA with M1b patient that present with brain metastasis, stereotactic radiosurgery (SRS) or surgical resection may be needed if it is symptomatic,[16] for early treatment, short term of steroids maybe used for reducing inflammation in brain and decrease brain edema to provide relief of the symptoms temporarily.[17]

Table 1: Summary of AJCC 8th staging[12]

T	N	M	Stage
T1mic, T1a	N0	M0	IA1
T1b	N0	M0	IA2
T1c	N0	M0	IA3
T2a	N0	M0	IB
T2b	N0	M0	IIA
T1–2	N1	M0	IIB
T3	N0	M0	IIB
T1–2	N2	M0	IIIA
T3	N1	M0	IIIA
T4	N0–1	M0	IIIA
T1–2	N3	M0	IIIB
T3,4	N2	M0	IIIB
T3,4	N3	M0	IIIC
Any T	Any N	M1a,b	IVA
Any T	Any N	M1c	IVB

AJCC American Joint Committee on Cancer

Lung cancer has a bad survival outcomes and high mortality rates as most patient are come in late stage. Overall of 5 years survival rate for lung cancer combined is 19% where non-small cell lung cancer 5 years survival alone is 23%, way higher than small-cell lung cancer that account for 6%.[5]

4. Conclusion

Lung cancers are the most common cancer and also the most common cause of cancer death in men and women combined, tobacco smoking is linked as a major factor of lung cancer. Patient with lung cancer often diagnosed in late stage as it doesn't show symptoms until it reach late stage. Squamous cell lung cancer is the second most common lung cancer and commonly located in the central as it is originate from airway lining cells.

Brain is a common distant metastasis for lung cancer and could be challenging for physician. Histological finding is important to establish the diagnosis, once the diagnosis is established, the treatment is depend on the staging of the disease. The eight edition of TNM lung cancer staging are now used as a reference for establish the stage and NCCN guidelines are used to determine therapy modalities.

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Conflict of Interest
The research was carried out independently without involving the interests of other parties in this research.

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