Case Report

Advanced Small Cell Lung Cancer with Cerebellar Metastases – A Case Report

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Abstract

The case of a 76-year-old Malay male with a 40-year smoking history is presented. He was diagnosed with small cell lung cancer (SCLC) two years earlier and is on regular follow-up. His last follow-up was six months ago and he declined further evaluation. His recent hospitalization was due to his condition deteriorating two days later. He was admitted to the hospital with pain and no fever. His condition worsened, and he was transferred to the Emergency Department. He was dehydrated and had a temperature of 39.5°C. Physical examination revealed a 76-year-old Malay male farmer, an active smoker who started to smoke at 20 years old with a 40-pack per day. He had a history of hypertension and hyperlipidemia, and his body weight was 80 kilogram, of which he lost 15 kilogram (19% of his body weight). Initially, his daily activity remained normal. However, one month prior to admission, he developed difficulty in maintaining his balance while walking and became dependent on activities of daily living. He also presented with headache and constitutional symptoms of malignancy. Clinical examination suggested the presence of right upper chest pain or hematemesis. He also had no symptoms of heart failure, chest pain, fever, history of tuberculosis contact, night sweating, history of prolong immobilization, calf pain or hematemesis. His last follow-up was six months ago and he did not complain of any symptoms.

The patient has underlying hypertension and hyperlipidemia. His wife was notified of diagnosis two years earlier and is on regular follow-up. His last follow-up was two years ago. His wife contacted the patient's family doctor about his symptoms. He was transferred to the hospital. On arrival, he was alert and was given oxygen support via nasal prong at 3L/minute. He had no symptoms of heart failure. On the day of admission, he presented with extra-thoracic metastases at the time of diagnosis. This is a case of a 76-year-old Malay male, smoker in the early stages of lung cancer.

The principle of management is mainly palliative than curative. Primary prevention should be given more emphasis as prevention is better than cure. Combined radiotherapy and chemotherapy helps to improve the quality of life of the patient. Secondary prevention and screening for early detection of malignancies detected at early stage. The importance of primary and secondary prevention in the management of which was mainly supportive. We would like to highlight the importance of primary and secondary prevention in the management of SCLC, as advanced disease carries a poor prognosis.

We report an advanced case of SCLC with brain metastases, the majority of whom are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers. The majority of smokers are smokers.

Key Points:

- SCLC with cerebellar metastases carries poor prognosis.
- Combined radiotherapy and chemotherapy helps to improve the quality of life of the patient.
- Secondary prevention and screening for early detection of malignancies detected at early stage.
- The importance of primary and secondary prevention in the management of SCLC, as advanced disease carries a poor prognosis.
- The principle of management is mainly palliative than curative.
of any problems to his primary care physician. Cardiovascular and respiratory examinations were normal during that visit. He is compliant with his medication (perindopril 2mg and atorvastatin 20mg daily). He has no family history of malignancy.

On physical examination, he was conscious, in pain and in respiratory distress. His blood pressure was 130/88mmHg. Respiratory examination revealed right upper lung pathology evidenced by reduced chest expansion and vesicular breath sounds. Bilateral supraclavicular lymph nodes were palpable. Cerebellar signs such as dysdiadochokinesia, positive finger nose test and heel shin test were present and predominantly affected the left side of his body. Examinations of other systems were unremarkable.

A series of investigations were completed. Arterial blood gas (ABG) demonstrated type I respiratory failure with PaO2 of 53mmHg. A full blood count and liver function tests were normal. Blood urea and serum electrolyte showed a slight elevation of serum urea and creatinine. The chest radiograph revealed a right upper lobe collapse with loss of pulmonary vascular markings (Figure 1). T2-weighted MRI displayed a single ill-defined hyperintense lesion measuring 6 x 5 cm in the left cerebellum extending to the right cerebellum (Figure 2). His electrocardiography (ECG) showed sinus rhythm and was normal. Tuberculosis work-ups, including a Mantoux test and sputum acid-fast bacilli were negative.

Bronchoscopy was performed and demonstrated the presence of a mass in the right main bronchus measuring 5 x 3 cm. Biopsy confirmed small cell lung cancer (SCLC) as the histological diagnosis (Figure 3). Computerized Tomography (CT) scan of the thorax was not completed, as the service was not available at that time. Based on the examination findings, bronchoscopy and MRI, he was diagnosed with stage IV (T2N3M1) SCLC with cerebellar metastases.

The possible differential diagnoses included pulmonary and cerebellar tuberculosis, pulmonary embolism, stroke and myocardial infarction. Tuberculosis is common in Malaysia, however he denied any night sweats, tuberculosis contact and tuberculosis work-ups were negative. Pulmonary embolism was possible, but he did not complain of pleuritic chest pain or have a history of immobilization. Stroke and myocardial infarction were possible based on his risk factors, such as male gender, old age, smoking, hypertension and hyperlipidemia, but the progressive onset of the disease made this unlikely. In addition, the ECG ruled out ischemic changes. Therefore, the most likely provisional diagnosis at this point was right lung cancer with cerebellar metastases.

He was admitted to the respiratory care unit and given oxygen support via oxygen mask at 9L/minute. He was also given intravenous morphine 10mg daily dose for pain relief and intravenous pantoprazole 20mg twice daily dose to prevent gastric ulcers.

He was scheduled for palliative combined chemotherapy and radiotherapy. He was counseled on the disease burden and
the long term complications of the treatment. He understood and agreed to the treatment plan. The chemotherapy regimens included intravenous cisplatin 60-80mg/m² on day 1 for every 28 days and intravenous etoposide 80-120mg/m² on days 1 to 3 for every 28 days. Palliative low dose radiotherapy of about 20-30Gy was scheduled to be given in 5 to 10 fractions. Surgery was not indicated as the disease had already progressed to an advanced stage.

However, these therapies were not given because his condition rapidly deteriorated two days later. He collapsed suddenly, was intubated and given mechanical ventilation. Due to the sudden nature of his collapse, consent from the patient himself was not obtained for resuscitation. The decision to intubate was made after a discussion with family members. He was given intravenous adrenaline 1mg every five minutes. He passed away after failed cardio-pulmonary resuscitation (CPR) for 30 minutes. He was sent for post-mortem examination and autopsy confirmed that he had small cell lung carcinoma arising from right main bronchus with cerebellar metastases.

Discussion
The rapid progression of SCLC that has metastasized to the brain has been well documented in the literature. Case reports report that patients may survive for three to five, after being treated with a combined chemotherapy and radiotherapy regimen. A systemic review and meta-analysis concluded that first line treatment for advanced SCLC should include four to six cycles of etoposide in addition to either cisplatin or carboplatin. Oral or intravenous topotecan is recommended for patients that are resistant to first line treatments. However, the routine use of thoracic irradiation in patients with metastatic SCLC is not recommended. The optimal surveillance of metastatic disease involves 3-monthly CT scans to monitor disease progression and response to treatment.

A randomized control study showed that thoracic radiotherapy in addition to prophylactic cranial irradiation improved survival rates in the thoracic radiotherapy group than in the control group. However, Hirofumi Sakurai and et al., described two cases of SCLC with no metastatic lesions, where patients were started on early chemo radiotherapy and metastases were detected one and a half years later. This draws a question as to whether early treatment will benefit the patient. Generally, most of literature still supports early detection and treatment to reduce morbidity and mortality.

The majority of published case studies only discuss the benefit of early detection and treatment. However, there is still a need for case reports which discuss a standardized management of advanced SCLC with brain metastases. Some case reports highlight the role of gamma knife surgery and intracranial irradiation in advanced disease to prolong the survival rate. However, most patients do not easily accept brain surgery and irradiation because of concerns of intra-operative complications and post-operative intellectual reduction. As for chemotherapy regimens, combination of cisplatin and etoposide are usually used although it still has limited proven efficacy in preventing metastatic disease. All these factors contribute to the limited success rate in the treatment of advanced SCLC.

Conclusion
In conclusion, the rapid progression of advanced SCLC has posed many difficulties to clinicians treating this cohort of patients. Although there is no definitive treatment for advanced SCLC, we would like to stress the benefits of prevention and early detection. Attention should be drawn towards smoking as one of the most important contributors in the pathogenesis of lung cancer. Primary prevention by education on smoking cessation should be implemented and enhanced in the healthcare system. Images of lung cancer and obstetric complications caused by smoking have been printed on cigarette packing of many countries to discourage smoking. A study has shown that public education on tobacco smoking is still very low and public education campaigns are needed urgently to raise the public awareness on the harmful effects of tobacco products. Secondary prevention, which includes lung cancer screening among active and past smokers, should be encouraged for early disease detection. Tertiary prevention has limited role in treating advanced lung cancer. Therefore, prevention is always better than cure!
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Author Contributions
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