Development of Small Cell Lung Cancer Following Gunshot Wound to Chest

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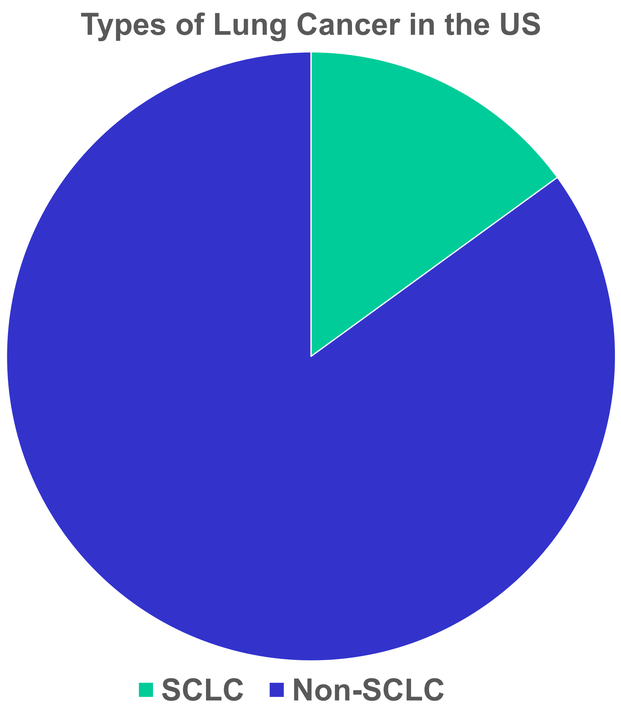
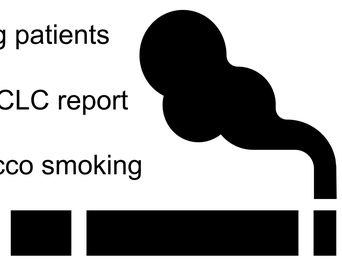
Introduction

- Small cell lung cancer (SCLC) is an aggressive malignancy that comprises about 15% of diagnosed lung cancer cases in the United States



- SCLC is notorious for its rapid growth and early metastasis, resulting in advanced staging for over two-thirds of newly-presenting patients
- Nearly all patients with SCLC report history of or current tobacco smoking

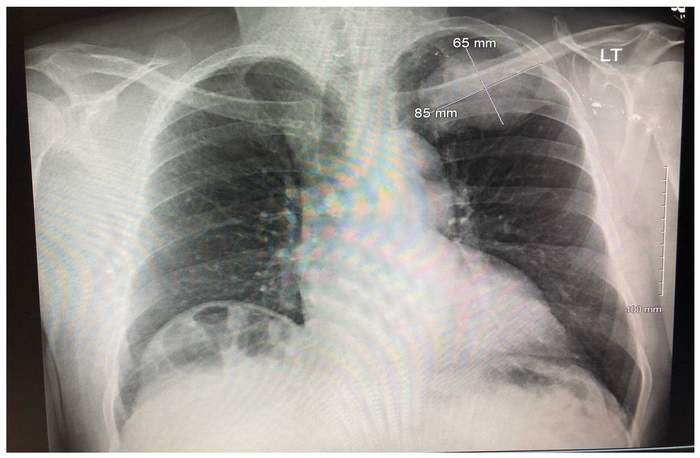


- A direct causal relationship between sites of trauma and development of SCLC has not been well studied
- We report a case of a patient who presented with biopsy-proven SCLC of the left lung, 45 years following a gunshot wound to the left chest

Case

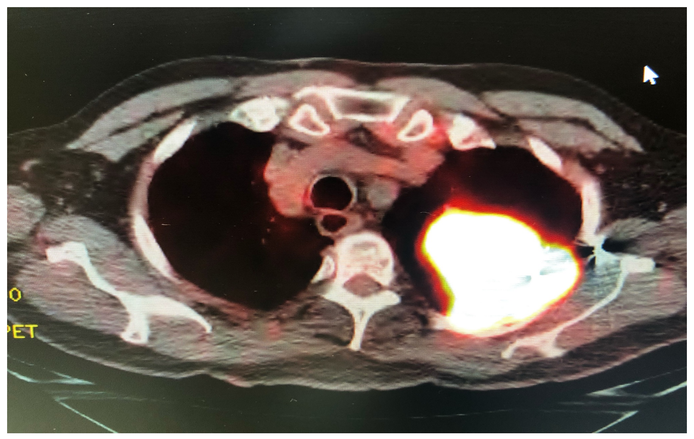
- A 70-year-old male presented with cough and shortness of breath
- 45 years prior, he suffered a single .38 caliber gunshot wound to the left chest; the metal projectile was left in situ
- Initial workup included a CXR (see Figure 1) and a CT scan of the chest, which revealed a 7.6 x 7.5 cm mass in his left lung and metallic fragments in the left axilla and posterior mediastinum; a CT-guided biopsy confirmed SCLC
- A PET scan revealed no evidence of any distant metastases
- While the patient reports a previous history of tobacco use, he had quit smoking at age 40, three decades prior
- The patient and his physicians opted for surgical resection
- Pathology showed grade 3 poorly differentiated small cell carcinoma with clear surgical margins and ten benign lymph nodes Interestingly, metal fragments from the lead bullet were identified within the mass
- At 4 and 6 weeks, patient was recovering well and started chemo

Figure 1



- Chest X-ray shows a large mass (biopsy-proven small cell carcinoma) in the upper left chest

Figure 2



- PET scan of the chest depicts a 7.6 x 7.5 cm hypermetabolic mass (SUV 18) in the left upper lobe of the lung with local chest wall involvement.

Conclusion

- This case illustrates a possible relationship between the long-term presence of a foreign body and small cell lung cancer development
- As bullet fragments remained in the patient long after the initial injury, we question whether the presence of foreign bodies themselves, such as metallic objects, may give rise to tumorigenesis and whether the biology and disease course of SCLC associated with foreign bodies are different from tobacco-related SCLC
- We also raise the possibility of a relationship between foreign body trauma and lack of tumor metastasis, especially because SCLC is a cancer notable for aggressive metastasis
- Further studies would be helpful in delineating the relationship between trauma and SCLC