Case report

Intraocular metastasis of small cell lung cancer: a case report

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ABSTRACT

We report a rare case of intraocular metastasis of small cell lung cancer with disease progression.

Key words: intraocular metastasis, SCLC, small cell lung cancer

ADMISSION

As one of the leading causes of cancer death, small cell lung cancer (SCLC) accounts for approximately 15–17% of all lung cancers. It is considered one of the most aggressive malignancies, characterized by rapid tumor growth and early distant metastasis. Clinically, it can be classified as limited-stage SCLC (LS-SCLC) or extensive-stage SCLC (ES-SCLC). It is associated with a 5-year survival rate of 10–13% for LS-SCLC and 1–2% for ES-SCLC. In addition, extensive-stage small cell lung cancer accounts for approximately two-thirds of all SCLC, reflecting the fact that most diagnoses are associated with distant metastases [1].

In December 2023, a 62-year-old man presented to the emergency department with visual disturbances, weakness, and swelling in his right upper extremity. The patient had a medical history of receiving chemotherapy with KE (carboplatin + etoposide), immunotherapy with atezolizumab, atezolizumab monotherapy, KE chemotherapy, and palliative radiotherapy to the area of tumor infiltration of the spine at the Th12-L2 level for T4N2M1 small cell carcinoma of the right lung.

COURSE OF DISEASE

In August 2022, the patient was diagnosed with severe spinal pain. An MRI of the spine revealed a pathological signal in the entire L1 vertebra, along with a mass that extended beyond the bony structures. This mass caused compression of the meningeal sac and spread into the spinal canal on the ventral, dorsal, and right sides. Pathologic signal of the L2 vertebral body approximately 30 mm in size and infiltration of the intervertebral foramina on the right side at the Th12/L1 and L1/L2 levels were visualized. To investigate the origin of these lesions, imaging studies were conducted, including computed tomography of the chest. The results revealed a pathological mass of about 66 × 54 × 44 mm in size located in the upper lobe of the right lung in seg. 2/3. The bronchus leading to the upper lobe of the right lung was narrowed, and the adjacent parenchyma showed atelectatic changes. Additionally, there was up to 5 mm of fluid in the right pleural cavity. The chest CT scan also revealed enlarged paratracheal lymph nodes measuring up to 14 mm, 16 mm at the right main bronchus, and 17 mm retrosternally. Simultaneously, a CT scan of the abdomen revealed a 38 × 32 × 66 mm lesion in the left adrenal gland with a densitometry of 45 HU. Consequently, a bronchoscopy was performed, during which six sections were taken for histopathologic examination. The result confirmed a small cell carcinoma of the lung. At the time of examination, there was a submucosal infiltration of the upper lobar bronchus that closed the orifices of its segmental bronchi and progressed to the small spur. A CT scan of the head showed no significant abnormalities.

At the time of presentation, the patient's general health was good, with a performance status of 1 on the Eastern Cooperative Oncology Group (ECOG) [2] performance status scale. There were no significant comorbidities or genetic predisposition. The patient denied a history of cigarette smoking or lifetime substance abuse. On physical examination, the only significant symptom was noted tenderness in the spine at the lumbosacral level with muscle weakness in the lower extremities.

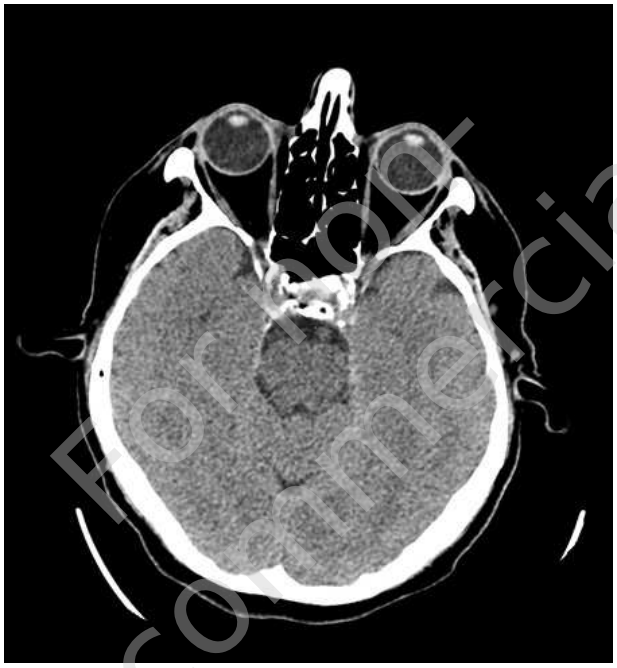
The patient received palliative radiotherapy, with 20 Gy administered in 4 fractions to manage pain caused by tumor infiltration of the spine. Following the histopathological results, the patient began immuno-chemotherapy as part of the KE + atezolizumab program. The patient received four courses of treatment, after which a vascular port was implanted. During the third course, the patient received GCSF prophylaxis. The patient received four cycles of monotherapy with atezolizumab after being qualified for immunotherapy due to disease stabilization. Subsequently, due to disease progression, the patient received six cycles of palliative chemotherapy according to the KE program.

IMAGING DIAGNOSTICS

During subsequent hospitalizations, the patient underwent chest and abdominal CT scans systematically. After completing the second cycle of immuno-chemotherapy, the lesions partially regressed, reaching 44% according to Response Evaluation Criteria in Solid Tumors (RECIST) 1.1 [3]. Additionally, aneurysmal dilatation of the infrarenal aorta up to 31 mm, with the presence of adjacent thrombi, and aneurysmal dilatation of the common iliac artery were observed. The evaluation by the vascular surgeon concluded that surgical intervention was unnecessary. After the fourth cycle of treatment, the target lesions showed a sustained regression of approximately 47%. Additionally, previously undetected osteosclerotic lesions in the L1 and L2 vertebrae were identified. An MRI of the spine was conducted to differentiate between disease progression and calcification of meta lesions following radio- and immunotherapy. The study revealed no pathological masses protruding into the spinal canal, and the remaining lesions remained stable compared to the previous MRI scan. However, after completing the sixth course of atezolizumab monotherapy, there was significant disease progression on the CT scan, with metastatic lesions appearing in the liver. Additionally, there were several meta lesions in the peritoneum that infiltrated the ureter. The kidney's pyelocalyceal system ex-

hibited signs of obstruction and dilation. However, the urologist determined that there was no need for nephrostomy placement. Following the third course of chemotherapy using the KE program, imaging studies were conducted. These studies showed disease regression in accordance with the RECIST 1.1 [3] PR criteria. In September 2023, following the sixth course, CT scans of the brain, chest, and abdomen were conducted. The results were consistent with RECIST 1.1 [3] PR disease regression, and no significant abnormalities were detected in the head CT scan (fig. 1).

Figure 1. CT scan of the head without contrast status as of September 2023.



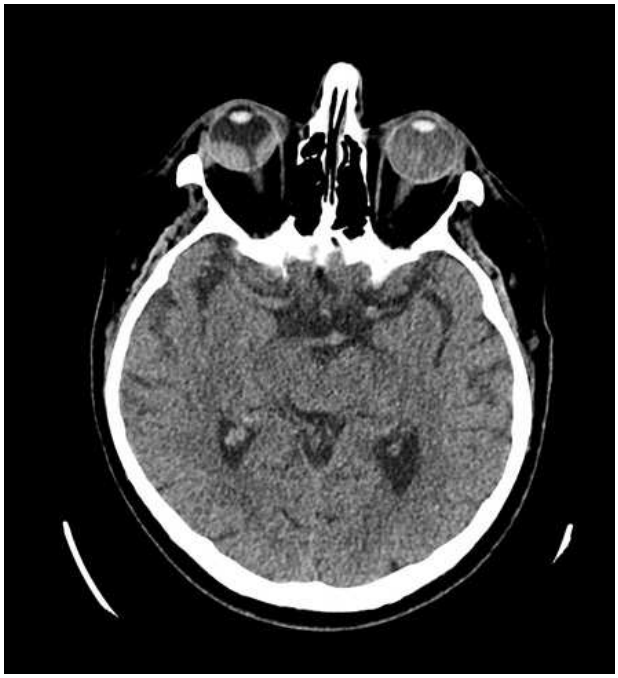
DETECTION OF METASTASES

A male patient presented to the Hospital Emergency Department after a three-month period without therapy due to worsening symptoms. These included deterioration of his general condition, impaired vision and hearing, and the presence of edema in his right upper limb, which had persisted for about 3 weeks. Upon physical examination, the upper limb was significantly swollen, and the lower right limb was also swollen. There were significant meta changes in the subcutaneous tissue. Upon auscultation, there were audible rales in the right lung region. The patient had pressure soreness in the lumbosacral spine and muscle weakness in the lower extremities. Visual impairment was noted, with the patient only able to recognize shapes during the examination. Additionally, there was swelling of the vascular port area without signs of inflammation. The interview revealed that the patient was able to recognize differentiate colors periodically.

Based on the patient's general examination, they were determined to be in moderately severe condition, classified as ECOG [2] category 3. The chest computed tomography showed a 59 × 58 mm tumor on the right side in the hilar area, stenosis of the main bronchus, pleural fluid about 42 mm above the atelectatic lesion, numerous small nodules, and multiple milk-glass-type lesions in the lower and middle lobes of the right lung, as well as fluid in the left pleural cavity at the level of about 10 mm. Enlarged mediastinal lymph nodes and multiple nodules were observed in the subcutaneous tissue of the breast.

The head CT scan (fig. 2) revealed increased densities in the left frontal bone, along with thickening of the meninges up to 6 mm in the area adjacent to the left frontal bone and increased soft tissue thickening at the same level. No ambiguous focal changes were observed, and the central structures were intact without displacement. The ventricular system and basal vessels were within normal limits. Furthermore, structural heterogeneities were identified in the right eyeball, including a hyperdense area in the posterior region. Additionally, elevated densities were observed in the left eyeball.

Figure 2. CT scan of the head without contrast status as of December 2023.



The patient underwent an ophthalmological consultation due to observed changes.

During the examination of the left eye, complete retinal detachment, yellow reflex, and abnormal light projection were detected.

The right eye had a visual acuity (Vis OP) of 0.05 sc, which did not improve with correction. The fundus examination of the right eye revealed a pale pink II nerve disc, a vascular riser, a central fossa, and normal arterial and venous vessels. Retinal detachment was observed in both the upper and lower regions of the eye, and the macula was completely detached. The anterior chamber maintained a medium depth.

The ultrasound examination revealed infiltration along the upper area of the eyeball wall and echoes of the detached retina in both the upper and lower parts of the right eye. The left eye, on the other hand, showed an infiltrate covering the entire posterior-lateral wall of the eyeball and complete retinal detachment.

CONCLUSION

Intraocular metastases are uncommon, particularly in small cell lung cancer, resulting in limited literature on the subject [4]. The presented case involves a patient diagnosed with ES-SCLC, where despite treatment attempts, significant tumor spread occurred. This case highlights the necessity for further research into treatment strategies and patient monitoring in the context of metastasis evolution in this type of cancer.

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References

1. Zheng Z, Liu J, Ma J et al. Advances in new targets for immunotherapy of small cell lung cancer. Thorac Cancer [Internet]. John Wiley & Sons, Ltd; 2024 (access: 3.01.2024); 15(1): 3-14. https://onlinelibrary.wiley.com/doi/full/10.1111/1759-7714.15178.
2. Tabela 15.13-12. Skala sprawności według Eastern Cooperative Oncology Group (ECOG) | Interna [Internet] (access: 8.01.2024). https://www.mp.pl/interna/table/016_8031.
3. Płuzański A. Evaluation of response to treatment — criteria RECIST 1.1. Nowotwory. Journal of Oncology [Internet]. Via Medica; 2014 (access: 6.01.2024); 64(4): 331-5. https://journals.viamedica.pl/nowotwory_journal_of_oncology/article/view/NJO.2014.0055/34039.
4. Maller B, Salvatori S, Tanvetyanon T. Outcomes of Intraocular Metastasis From Lung Cancer in the Era of Targeted Therapy: A Systematic Review and Pooled Analysis. Clin Lung Cancer. 2022; 23(8): e519-25.

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Ethics:
The authors had full access to the data and take full responsibility for its integrity. All authors have read and agreed with the content of the manuscript as written. The paper complies with the Helsinki Declaration, EU Directives and harmonized requirements for biomedical journals.