CRCP Case Reports in Clinical Practice

Case Report

Journal Homepage: http://crcp.tums.ac.ir

# Spindle Cell Carcinoma Presenting as a Lung Cancer: A Seldom-Seen Case

**Ali Goudarzi**[1,2*], **Leila Ostovar**[3]

*1. Radiology Department, Shiraz University of Medical Sciences, Shiraz, Iran.*
*2. Student Research Commitee, Shiraz University of Medical Sciences, Shiraz, Iran.*
*3. Diagnostic Radiologist, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.*

Use your device to scan and read the article online

**Citation** Goudarzi A, Ostovar L. Spindle Cell Carcinoma Presenting as a Lung Cancer: A Seldom-Seen Case. Case Reports in Clinical Practice. 2024; 9(3): 133-136.

**Running Title** Spindle Cell Carcinoma Presenting as a Lung Cancer

**Article info:**
**Received:** May 12, 2024
**Revised:** May 29, 2024
**Accepted:** June 18, 2024

**Keywords:**
Pulmonary spindle cell carcinoma; Sarcomatoid carcinoma; Lung cancer; Immunohistochemistry

## ABSTRACT

Pulmonary spindle cell carcinoma (PSCC) is a rare and highly aggressive form of non-small cell lung cancer with sarcomatoid differentiation. It poses significant diagnostic challenges due to its histological resemblance to other malignancies, including inflammatory myofibroblastic tumors. This case report details the clinical presentation, histopathological findings, and treatment of a patient with PSCC, to further elucidate the clinical features, diagnosis, and management of this rare tumor.

## Introduction

Pulmonary spindle cell carcinoma (PSCC) is a rare subtype of sarcomatoid carcinoma, which represents less than 0.5% of all lung malignancies. It is characterized by spindle-shaped tumor cells that exhibit both epithelial and mesenchymal features. Despite its classification under non-small cell lung cancer (NSCLC), PSCC shows high aggressiveness and a poor prognosis compared to other forms of lung cancer, even when diagnosed at an early stage. Due to its rarity, limited large-scale studies have been conducted on PSCC, and its clinical presentation often overlaps with other malignancies, making it prone to misdiagnosis [1,2].

Previous reports highlight the importance of comprehensive diagnostic tools such as immunohistochemistry and genetic analysis to establish a definitive diagnosis. Moreover, while surgery remains a key treatment modality, chemotherapy, radiotherapy, and targeted therapies, including immunotherapy, are often employed to manage PSCC. However, due to the aggressive nature of PSCC, survival outcomes remain poor, especially in advanced stages [3].

*** Corresponding Author:**
***Ali Goudarzi***
***Address:*** *Radiology Department, Shiraz University of Medical Sciences, Shiraz, Iran.*
***E-mail:*** *aligoodarzii110@gmail.com*

In this report, we present a case of PSCC to provide insights into its clinical and pathological characteristics.

## Case Presentation

A 61-year-old male patient, a former smoker with a 30-pack-year history, presented to our clinic with complaints of chronic cough, hemoptysis, and unexplained weight loss. Evaluation using computed tomography (CT) revealed a 116*113 mm tumor with a central low-density area suggestive of necrosis, with no distant metastasis identified at the time (Figures 1 & 2).

A core biopsy of the lesion was performed, and histopathological findings showed a neoplastic growth composed of fascicles of spindle cells with elongated hyperchromatic nuclei and foci of necrosis. Further analysis, including immunohistochemistry, revealed the tumor cells to be weakly positive for CD34 and positive in 2-3% of tumoral cells for Ki67, but negative for CK, S100 protein, and smooth muscle actin (SMA), compatible with the diagnosis of PSCC (Table 1).

Given the patient's overall good performance status, a decision was made to proceed with surgical resection. However, the patient's condition deteriorated rapidly, and surgery was no longer deemed feasible. Chemotherapy with carboplatin and albumin-bound paclitaxel was initiated, but the patient unfortunately succumbed to the disease within two months of diagnosis.

## Discussion

PSCC is known for its aggressive clinical course and poor prognosis, with most patients surviving less than two years post-diagnosis [1,3]. Due to its rarity, PSCC is often misdiagnosed as other tumors, such as inflammatory myofibroblastic tumors, which share similar histological features. Therefore, accurate diagnosis relies heavily on a combination of histopathology and immunohistochemical studies. In our case, the use of immunohistochemistry was crucial in differentiating PSCC from other malignancies.

Surgical resection is typically the primary treatment modality for early-stage PSCC, with better outcomes reported for patients who undergo surgery compared to those treated with chemotherapy alone. However,

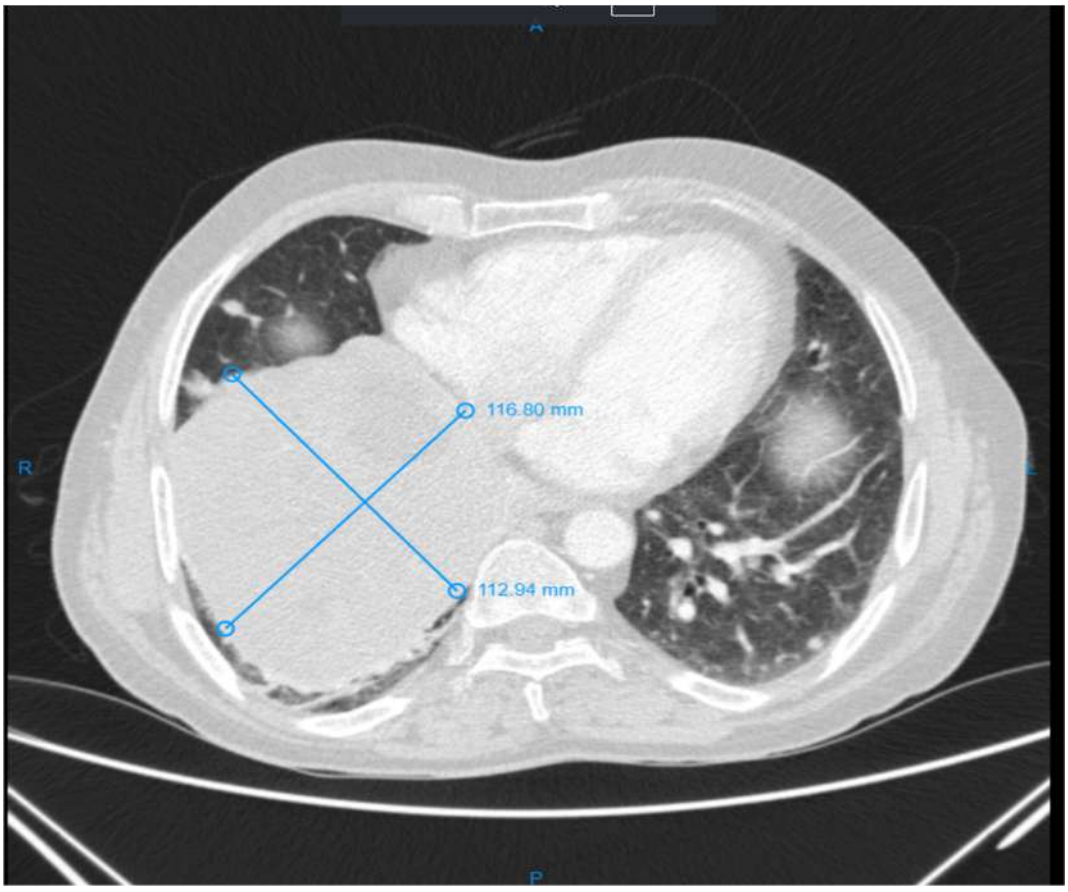


**Fig. 1.** Axial contrast-enhanced chest CT scan reveals a 116*113mm heterogenously enhancing mass containing area of necrosis in the right lower lobe which has compression effect on the right border of the heart

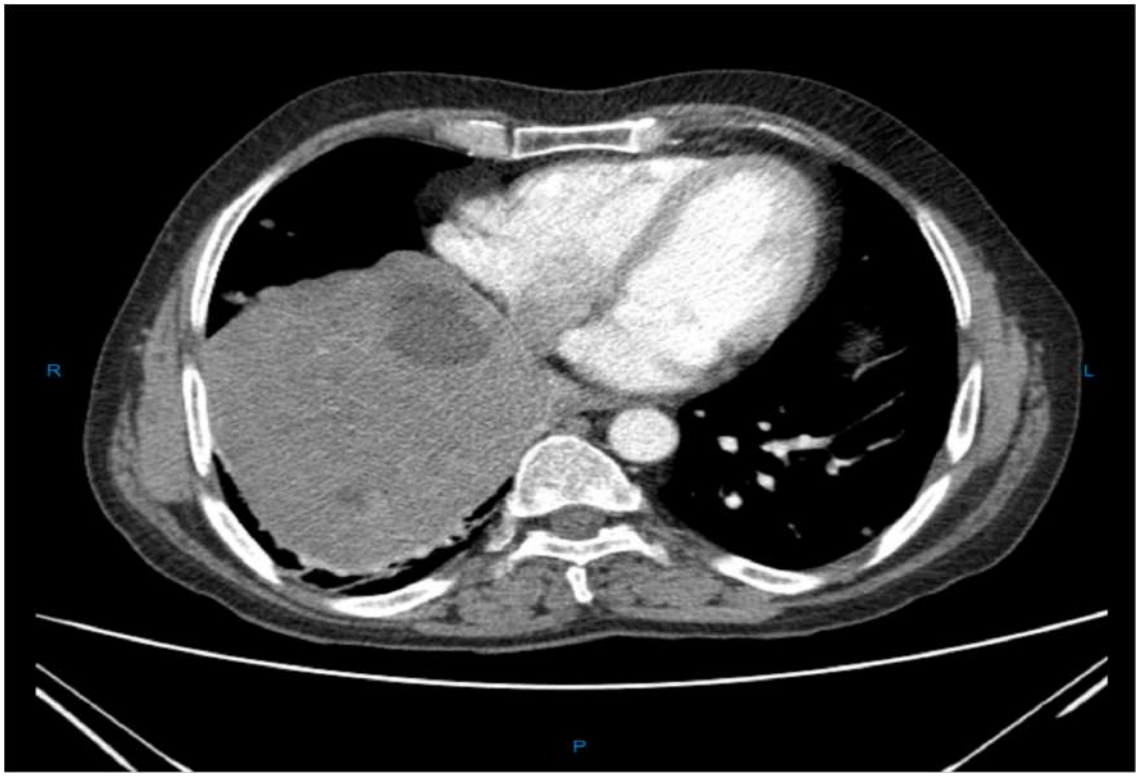


**Fig. 2.** Mediastinal window of the axial contrast-enhanced chest CT scan showing the mentioned tumor and its heterogenous enhancement and areas of necrosis.

**Table 1.** IHC profile result

| CD34 | Weakly positive in tumoral cells |
|---|---|
| ki67 | Positive reaction in 2-3% of tumoral cells |
| CK | Negative |
| S100 | Negative |
| SMA | Negative |

as seen in this case, patients often present at an advanced stage or with comorbidities that preclude surgical intervention. Chemotherapy remains the mainstay of treatment for inoperable cases, although the efficacy of various regimens has not been well established. For instance, the use of carboplatin and albumin-bound paclitaxel has been reported in previous case studies to extend survival, though further investigation is required to confirm these findings [2,3].

The role of immunotherapy in PSCC is currently under investigation. As many sarcomatoid carcinomas express programmed death-ligand 1 (PD-L1), there is interest in exploring PD-L1 inhibitors as a potential treatment strategy. However, as of now, evidence supporting the efficacy of immunotherapy in PSCC is still limited [1]. Given the limited treatment options and poor prognosis, further research into the molecular mechanisms of PSCC and the development of targeted therapies is urgently needed.

## Conclusion

Spindle cell carcinoma (SpCC) of the lung, though rare, represents a significant diagnostic and therapeutic challenge due to its unique morphological features and overlapping characteristics with other sarcomatoid and NSCLC subtypes. Comprehensive immunohistochemical analysis has proven essential for accurate classification, as it facilitates differentiation between SpCC and other variants of sarcomatoid carcinoma. Studies, such as those conducted by Weissferdt et al., underscore the importance of using extensive marker panels to reclassify many of these tumors as poorly differentiated adenocarcinomas or squamous cell carcinomas, potentially opening the door to more tailored treatment strategies.

Despite advances in diagnostic methods, SpCC

continues to be associated with poor clinical outcomes, emphasizing the need for continued research and a unified approach to classification and management. Enhanced understanding of its immunohistochemical profile could lead to better diagnostic precision and, ultimately, more effective personalized treatments. This approach aligns with the goals of modern precision oncology, where accurate tumor typing informs targeted therapeutic interventions and improves patient outcomes.

## Acknowledgements

This case report was obtained from a patient in Rafsanjan Hospital, and the pathological results of this case was confirmed at the pathology laboratory of Afzalipour hospital in Kerman.

## Ethical Considerations

### Ethical statement

We confirm that this work was conducted in accordance with the Declaration of Helsinki and that all participants provided informed consent.

### Funding

No funding was received to assist with the preparation of this manuscript.

### Conflict of Interests

The authors declare that they have no competeing interest.

### Data availability statement

Data is available from the corresponding author upon reasonable request via email.

## References

[1] Zhang J, Yan Y, Hui B, Bai S, Ma W, Ren J. Clinicopathological characteristics and prognosis of pulmonary spindle cell carcinoma (PSCC): a population-based retrospective study. Ann Palliat Med. 2021 Apr;10(4):3793-803. https://doi.org/10.21037/apm-20-1841

[2] Qi DJ, Liu B, Feng L, Zhao L, Yan P, Du J, Zhang QF. Pulmonary spindle cell carcinoma with unusual morphology: A rare case report and review of the literature. Medicine (Baltimore). 2017 Jun;96(24). https://doi.org/10.1097/MD.0000000000007129

[3] Terada T. Spindle cell carcinoma of the lung: Frequency, clinical features, and immunohistochemical studies of three cases. Respir Med CME. 2010;3(4):241-5. https://doi.org/10.1016/j.rmedc.2009.10.003