Peripheral Squamous Cell Carcinoma of the Lung in a Smoker: A Radiological Case Report and Literature Review

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Abstract:

Squamous cell carcinoma (SCC) of the lung most often arises in the central bronchi and is strongly associated with tobacco exposure. However, peripheral squamous cell carcinoma (pSCC) is increasingly recognised as a distinct variant, often radiologically resembling adenocarcinoma and posing diagnostic difficulties, particularly in smokers with emphysema. A 76-year-old chronic smoker presented with persistent cough and weight loss. Chest X-ray revealed an ill-defined opacity in the right perihilar region, with a few thin atelectatic linear bands in the lower zones. Contrast-enhanced computed tomography (CT) of the chest showed an irregular, spiculated soft-tissue mass measuring approximately 4.4 × 3.7 cm in the superior segment of the right lower lobe, with multiple smaller spiculated nodules in the right upper and middle lobes on a background of centrilobular emphysema. Mildly enlarged right pre-paratracheal and subcarinal lymph nodes were also noted. CT-guided biopsy revealed SCC. Histopathology showed well-differentiated SCC with keratin pearls and intercellular bridges. Immunohistochemistry was positive for p40 and cytokeratin 5/6 (CK5/6) and negative for thyroid transcription factor-1 (TTF-1) and Napsin A. Peripheral squamous cell carcinoma, though less common than central SCC, should be considered in smokers presenting with spiculated peripheral pulmonary nodules. These lesions can mimic adenocarcinoma radiologically, may invade the pleura, and often require CT-guided biopsy or surgical resection for definitive diagnosis. Awareness of this variant is important to avoid misclassification and guide appropriate management.

Key words: Peripheral Lung Carcinoma, Squamous Cell Carcinoma, Smoking, CT Chest, Radiology, Case Report.

Introduction

Lung cancer remains the leading cause of cancer-related mortality worldwide. Squamous cell carcinoma (SCC) traditionally arises from the central bronchi and is strongly linked to long-term smoking.[1] However, an increasing number of SCCs are being identified peripherally within the lung parenchyma, a phenomenon attributed to changes in smoking habits and improved imaging detection.[1-3] Peripheral squamous cell carcinoma (pSCC) can closely mimic adenocarcinoma on imaging due to its peripheral location and spiculated appearance.[4,5] Recognition of this subtype is important, as it exhibits different histopathological characteristics, biological behaviour, and therapeutic implications.[6,7]

Case Report

A 76-year-old male chronic smoker presented with chronic cough, dyspnoea, and unintentional weight loss. Chest X-ray (posteroanterior view) revealed an ill-defined opacity in the right perihilar region, with thin atelectatic bands in both lower zones (Figure 1). Contrast-enhanced computed tomography (CT) of the chest showed an

irregular, spiculated soft-tissue mass measuring 4.4 × 3.7 cm in the superior segment of the right lower lobe, along with multiple smaller spiculated nodules in the right upper and middle lobes on a background of centrilobular emphysema (Figure 2A–C). Mild right pre-paratracheal and subcarinal lymphadenopathy was noted, with no evidence of pleural effusion or chest wall invasion.

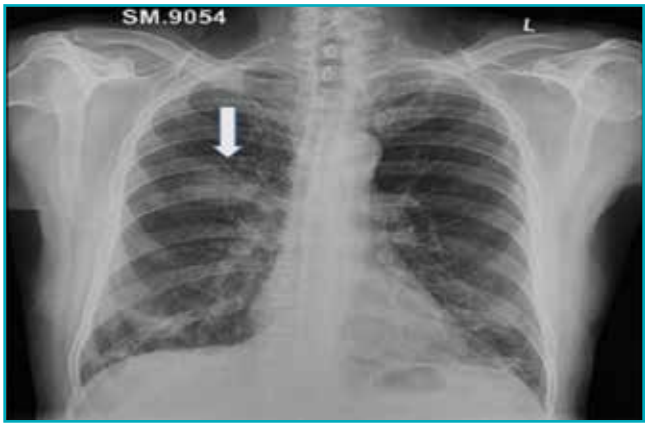
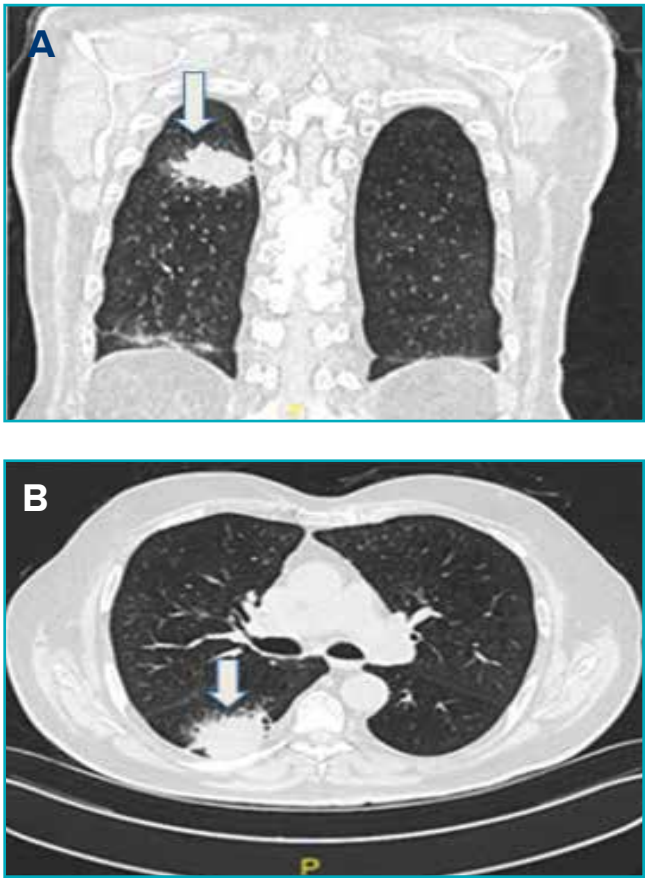


Figure 1: Chest X-ray (anteroposterior view) showing an ill-defined opacity in the right perihilar region, with thin atelectatic linear bands in the lower zones of the right lung (white arrow).



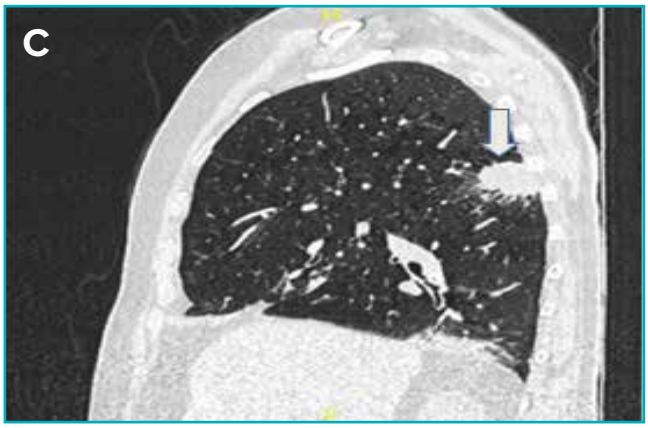


Figure 2A–C: High-resolution computed tomography (HRCT) images — coronal, axial (A and B), and sagittal (C) views — showing a spiculated soft-tissue mass in the superior segment of the right lower lobe, with background centrilobular emphysema (white arrows).

Histopathology findings:

CT-guided biopsy revealed SCC characterised by keratin pearls and intercellular bridges. The degree of differentiation was consistent with well to moderately well-differentiated SCC. Immunohistochemistry showed positivity for p40 and cytokeratin 5/6 (CK5/6) and negativity for thyroid transcription factor-1 (TTF-1) and Napsin A, confirming squamous differentiation.

Discussion

pSCC is an uncommon subtype of pulmonary SCC that arises from smaller bronchi or alveolar epithelium, unlike the more typical central SCC.[3,4] Although most SCCs are centrally located, peripheral SCC should be considered in smokers presenting with spiculated peripheral pulmonary lesions, as failure to recognise this variant may delay accurate diagnosis and management. Radiologically, pSCC appears as a spiculated or lobulated peripheral mass, occasionally with cavitation or adjacent emphysema.[5,6] Distinguishing pSCC from adenocarcinoma based solely on imaging is challenging.[7] Histopathologically, pSCC demonstrates keratinisation and intercellular bridges, with immunohistochemistry (p40+, CK5/6+, TTF-1–, Napsin A–) being crucial for confirming squamous differentiation.[8] Several studies and case series, including the one by Watanabe *et al.*, have characterised the clinicopathologic and radiologic features of pSCC,[3,4] highlighting the importance of awareness and accurate diagnosis to guide management and prognostication.

Declarations

- **Ethics approval and consent to participate:** Not required, as this report describes anonymised radiological data.
- **Consent for publication:** Not applicable, as no identifiable patient information is included.
- **Competing interests:** The authors declare no competing interests.
- **Funding:** None.
- **Authors' contributions:** Dr. Sylvia Bedas Nsato conceived the case, performed imaging analysis, conducted the literature review, and drafted the manuscript. Supervisors and co-authors contributed to imaging interpretation, critical revision, and manuscript approval. All authors reviewed and approved the final manuscript.

Conclusion

pSCC is a less frequent but increasingly recognised variant of pulmonary SCC. It should be actively considered in the differential diagnosis of spiculated peripheral lung masses in smokers, as imaging alone is non-specific. Histopathological and immunohistochemical confirmation are essential for accurate diagnosis, appropriate treatment planning, and prognostication.

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