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# Central Airway Invasion of Lung Squamous Cell Carcinoma Causing Bronchomediastinal Fistula and Mediastinitis

Hana Miyasaka | Hiroaki Ikushima | Masanori Kawakami | Akihisa Mitani | Hidenori Kage

Department of Respiratory Medicine, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan

**Correspondence:** Hiroaki Ikushima (hikushima-tky@umin.ac.jp)

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## ABSTRACT

We report a case of lung squamous cell carcinoma with bronchomediastinal fistula and mediastinitis caused by aggressive locoregional recurrence following bronchoscopic tumour debulking, chemoradiotherapy and durvalumab. Despite initial tumour regression, rapid regrowth led to airway penetration and infection, highlighting the challenges of managing central airway-invasive relapses.

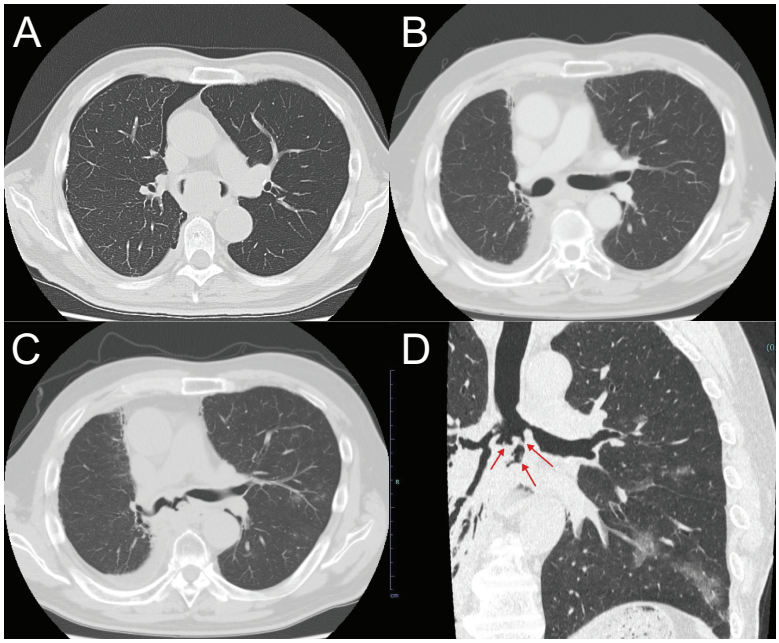


**FIGURE 1** | Serial chest CT images showing tumour regression and recurrence. (A) Initial CT at diagnosis showing tumour invasion into the carina, nearly obstructing both main bronchi. (B) Post-treatment CT after chemoradiotherapy and durvalumab showing marked tumour regression. (C) CT obtained 10 months later demonstrating rapid regrowth of subcarinal lymph nodes and invasion into the carina and left main bronchus, resulting in bronchomediastinal fistulization. (D) Coronal CT image corresponding to (C). Arrows indicate fistulas.

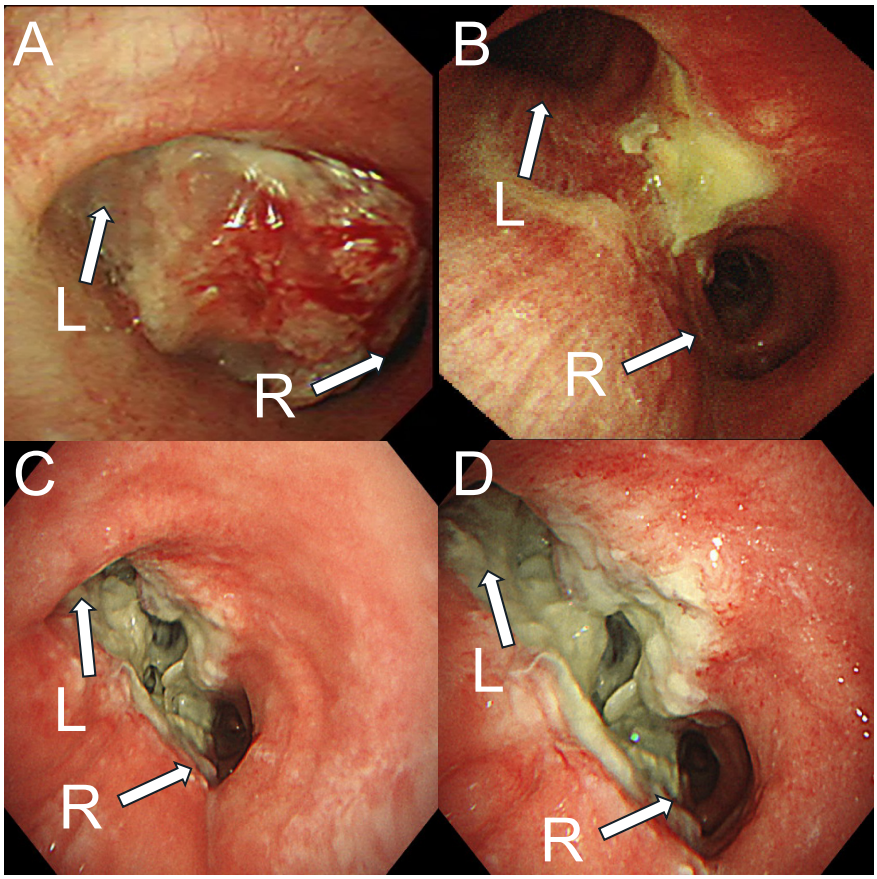


**FIGURE 2** | Serial bronchoscopic findings of the carinal region. (A) At diagnosis, a bulky tumour invaded the carina and nearly obstructed the bilateral main bronchi. (B) After completion of chemoradiotherapy and durvalumab, only scarring remained at the carina. (C, D) Ten months later, recurrent tumour growth with evidence of fistula formation and airway destruction was observed at the carina. R: right main bronchus, L: left main bronchus.

A 64-year-old male ex-smoker was diagnosed with right lower lobe lung squamous cell carcinoma (cT4N2bM0, cStage IIIB), which had extended to the carina, resulting in near-complete obstruction of both main bronchi (Figures 1A, 2A). He underwent bronchoscopic tumour debulking followed by concurrent chemoradiotherapy (cisplatin 60 mg/m$^2$ plus S-1120 mg/body/day, 60 Gy in 30 fractions) and consolidation therapy with durvalumab. Post-treatment imaging revealed tumour regression, leaving only scarring changes at the carina (Figures 1B, 2B). However, 10 months later, he developed progressive dyspnea and fever. CT revealed rapid enlargement of subcarinal lymph nodes with tumour invasion into the carina and the left main bronchus, resulting in bronchomediastinal fistulization (Figures 1C,D, 2C,D). Given the extent of tumour involvement, closure of the fistula by surgical reconstruction or stenting was considered unfeasible. Intravenous ampicillin/sulbactam was initiated with a diagnosis of mediastinitis secondary to malignant airway penetration. The patient opted for palliative care.

Mediastinitis due to malignant bronchomediastinal fistula is rare and often fatal, with limited treatment options [1]. While immunotherapy has improved outcomes in Stage III non-small cell lung cancer [2], clinicians should closely monitor for locoregional progression even after apparent tumour regression, particularly in patients with initial central airway involvement.

### Author Contributions

H.M. and H.I. drafted the manuscript. All authors were directly involved in treatment, critically revised the manuscript and approved the final version.

### Consent

The authors declare that appropriate written informed consent was obtained for the publication of this manuscript and accompanying images.

### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### References

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