



Rapid Lung Necrosis After Extended Sleeve Lobectomy

A Case Series of Acute Pulmonary Artery Thrombosis Requiring Completion Pneumonectomy

Kaori Shimizu, Shinsuke Uchida, Kana Kinjo, Takahiro Niimi, Takeshi Matsunaga, Kazuya Takamochi, Kenji Suzuki
Department of General Thoracic Surgery, Juntendo University School of Medicine, Tokyo, Japan
Correspondence: kjsuzuki@juntendo.ac.jp



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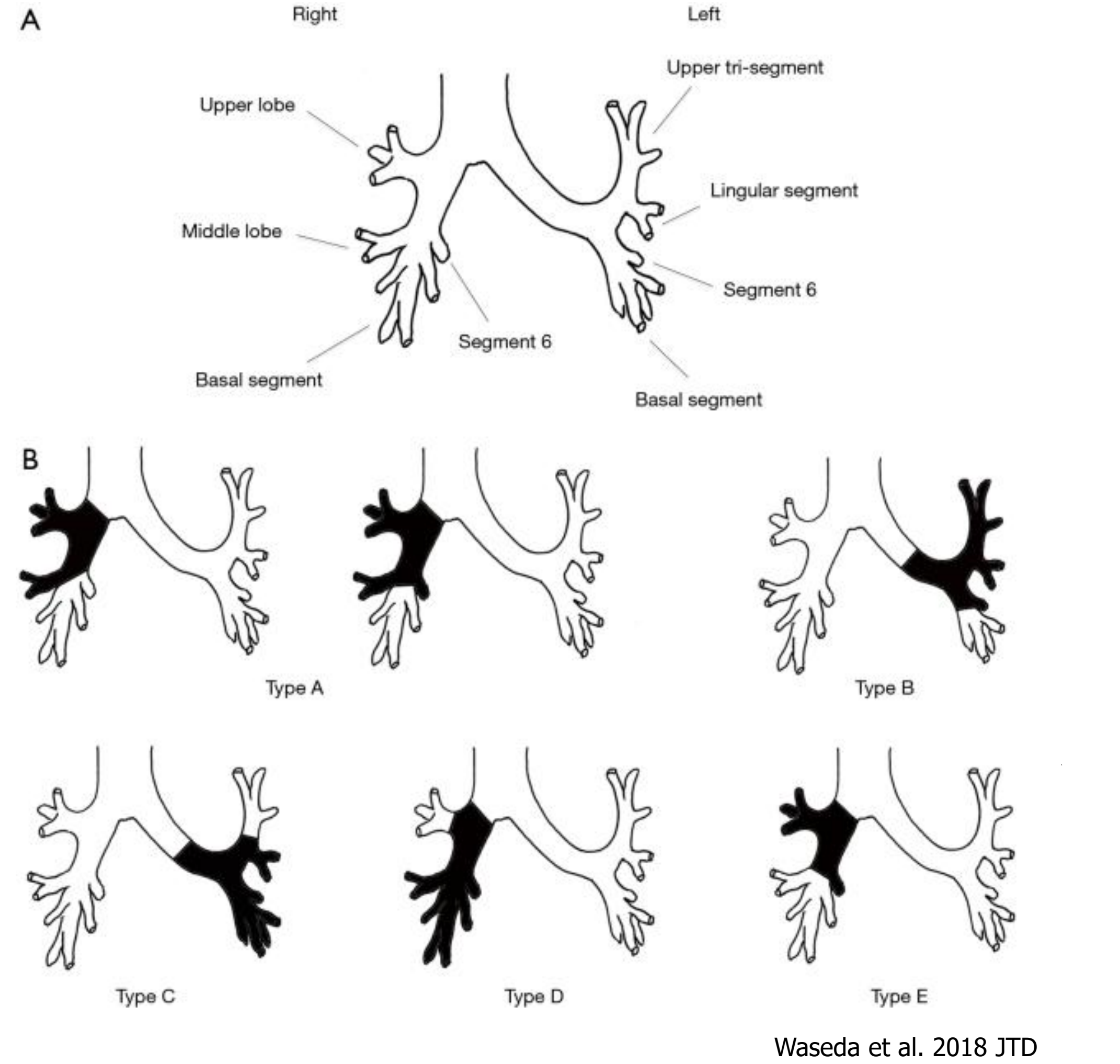
INTRODUCTION

Following extended sleeve lobectomy (ESL), bronchial arterial flow to the remnant lung is interrupted, making the lung highly dependent on pulmonary arterial perfusion. Although postoperative pulmonary artery thrombosis is rare, once it occurs, it can rapidly lead to lung necrosis and may be life-threatening. Early diagnosis is therefore critical; however, initial clinical and radiological findings are often nonspecific, making timely diagnosis challenging. We report three cases requiring completion pneumonectomy.

METHODS

Item	Details
Study design	Single-center retrospective case series
Study period	April 2008–March 2026
Study population	65 patients undergoing extended sleeve lobectomy
Cases analyzed	3 patients with remnant-lung perfusion failure and necrosis associated with confirmed or clinically suspected PA thrombosis, requiring completion pneumonectomy

3/65 patients (4.6%)



RESULTS

Item	Case 1	Case 2	Case 3
Patient / disease	34/F; right lung adenocarcinoma	68/F; pulmonary metastasis from rectal cancer	53/F; right lung adenocarcinoma
ESL procedure	Type A: right upper and middle lobectomy + S6 segmentectomy	Type C: left lower lobectomy + lingulectomy	Type A: right upper and middle lobectomy + S6 segmentectomy
PA reconstruction	Yes	No	Yes
Onset / clinical course	POD 5–6: rapidly progressive remnant-lung opacification	3 weeks after ESL: fever, pneumonia, cavitary abscess, and pleural effusion	POD 2: reduced PA perfusion without a visible thrombus POD 3: transient improvement POD 5: increasing base deficit POD 7: recurrent pulmonary opacification
Pulmonary vascular finding	PA thrombosis confirmed around A9–A10 with impaired basal perfusion	PA thrombosis confirmed at reoperation; kinked long PA stump	Documented severe perfusion failure; clinically suspected PA thrombosis due to anastomotic kinking of PA
Completion pneumonectomy	POD 6 after initial operation	3 weeks after initial operation	POD 10 for metabolic acidosis and progressive perfusion failure after initial operation
Outcome	Discharged on POD 12 after reoperation No recurrence	Discharged on POD 14 after reoperation No recurrence	Discharged on POD 16 after reoperation; later developed BPF/empyema and subsequently died of cancer

Case 2 was previously reported by Kinjo et al. [1].

A : Serial chest radiographs: rapid opacification from POD 5 to POD 6 POD; postoperative day

B : Contrast-enhanced CT on POD 6

C Intraoperative finding

B: Contrast-enhanced CT showing impaired perfusion of the remnant lung.

C: Intraoperative thrombus around A9–A10 at completion pneumonectomy.

DISCUSSION AND CONCLUSION

MECHANISM

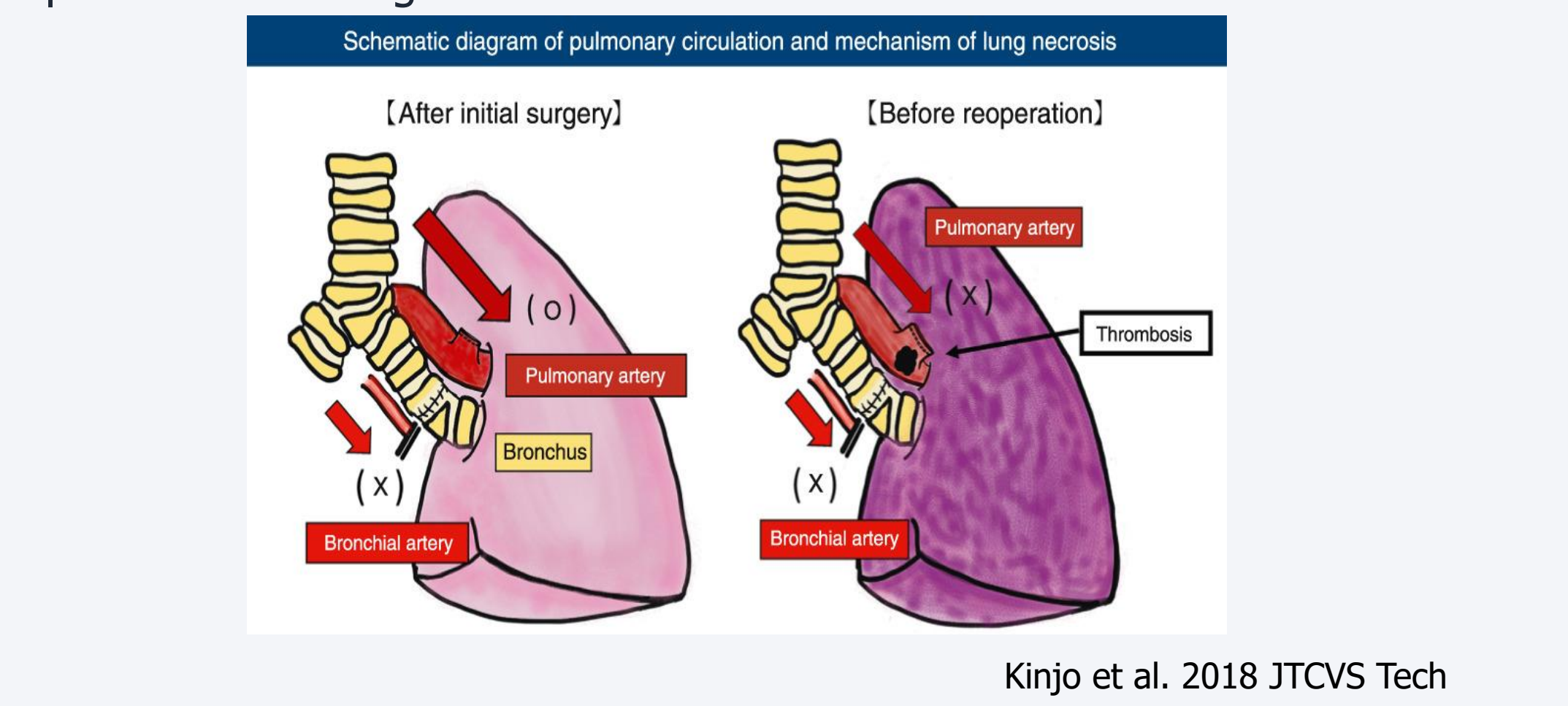
- Bronchoplasty interrupts bronchial arterial flow; the remnant lung becomes critically dependent on PA perfusion.
- Vascular compromise may occur distal to PA reconstruction (Case 1), from kinking of a long PA stump without reconstruction (Case 2), or from suspected PA thrombosis due to anastomotic kinking of PA (Case 3).

CLINICAL SIGNAL

- PA thrombosis was confirmed in 2 cases and clinically suspected in 1.
- Rapidly progressive remnant-lung opacification with clinical or metabolic deterioration should raise suspicion of perfusion failure.

MANAGEMENT & FUTURE DIRECTIONS

- Urgent contrast-enhanced CT should assess PA patency and remnant-lung perfusion; persistent deterioration warrants early surgical re-evaluation.
- Future studies should define early diagnostic criteria and preventive strategies after ESL.



KEY MESSAGE

After ESL, rapidly progressive remnant-lung opacification should prompt urgent evaluation for pulmonary perfusion failure—even without PA reconstruction. Because bronchoplasty interrupts bronchial artery flow.

REFERENCES & ACKNOWLEDGEMENTS

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2. Waseda R, Iwasaki A. Extended sleeve lobectomy: its place in surgical therapy for centrally located non-small cell lung cancer and a review of technical aspects. J Thorac Dis. 2018;10(Suppl 26):S3103–S3108.

3. Okada M, et al. Extended sleeve lobectomy for lung cancer: the avoidance of pneumonectomy. J Thorac Cardiovasc Surg. 1999;118:710–714.

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AI USE DISCLOSURE: ChatGPT (OpenAI) was used for English-language editing and layout assistance. All clinical content was reviewed and approved by the authors.

Definition of ESL: The modified ESL classification comprises Types A–E; the present cohort included bronchoplastic ESL Types A–D, irrespective of PA reconstruction.

Abbreviations: BPF, bronchopleural fistula; CT, computed tomography; ESL, extended sleeve lobectomy; F, female; PA, pulmonary artery; POD, postoperative day; PV, pulmonary vein.