Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Airway Fire During Left Pneumonectomy: A Case Report

Yang Zhang
Capital Medical University
Tong Meng
Capital Medical University
Jiandong Gao
jiandongdr@126.com

Capital Medical University

Case Report

Keywords: Airway fire, Pneumonectomy, Double-lumen tube, One-lung ventilation, Electrosurgery, Airway management

Posted Date: November 1st, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11063420/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Background.

Intraoperative airway fire is extremely rare yet potentially fatal, and an oxygen-filled tracheal tube is a major risk factor. Fire during pneumonectomy—in which the airway is simultaneously the operative field, the sole ventilatory route, and the conduit for combustion—is uniquely hazardous. We describe such a case and analyze its mechanism, management, and prevention.

Case presentation.

A 70-year-old man with hypertension, type 2 diabetes mellitus, and a long history of smoking underwent thoracoscopic resection of a centrally located left-lower-lobe squamous cell carcinoma. During left pneumonectomy, while the left main bronchus was being divided with monopolar electrosurgery, sudden flame and smoke indicated combustion of the double-lumen tube, which was judged nonventilatable and urgently changed to a single-lumen tube. Before chest closure, bronchoscopy showed red, edematous mucosa with diffuse black carbonized deposits over the carina and both main bronchi; four intraoperative lavage passes were performed, and three further passes were carried out intermittently while the patient remained intubated in the intensive care unit. He was extubated on the first postoperative day, developed transient atrial fibrillation on the second, and was discharged on the seventh. Histopathology confirmed keratinizing squamous cell carcinoma (pT4N2M0, stage IIIB).

Conclusions.

Recognition of the fuel–oxidizer–ignition triad, and preventive measures adopted before and during bronchial division, are essential. Once a fire occurs, immediate cessation of oxygen, rapid re-establishment of a ventilatable airway, aggressive bronchoscopic saline lavage, glucocorticoid pulse therapy, and supportive postoperative care together supported a favorable outcome; at follow-up the patient had completed five cycles of chemotherapy, with intermittent cough and sputum production and hoarseness attributed to unilateral vocal cord paralysis, but remained able to carry out the activities of daily living without clinically significant laryngotracheal stenosis.

Background

An intraoperative fire requires the simultaneous presence of three elements—a fuel, an oxidizer, and an ignition source—which is why the operating room is an environment at high risk of fire.[1,2] Within the airway, a locally oxygen-enriched atmosphere further lowers the ignition threshold, which explains why airway fires are classically encountered in head-and-neck and otolaryngologic surgery even though their overall incidence has fallen with advances in technique and prevention.[2,3] Tracheostomy is the most frequently reported elective setting: a review of the literature reports only about 25 cases of airway fire

during surgical tracheostomy between 1987 and 2012,[4] yet a single event can be fatal or leave lifelong airway disability.[5]

Airway fire arising during pneumonectomy is far rarer and conceptually distinct. During division of the bronchus the surgeon applies high-energy monopolar electrosurgery immediately adjacent to an indwelling double-lumen tube (DLT) while the remaining lung is ventilated at a high inspired oxygen concentration, both of which are intrinsic to the conduct of one-lung ventilation. Any breach of cuff integrity—or even conductive heat transmitted through the tube shaft in the absence of an obvious gas leak[3,6]—can ignite the polyvinyl chloride (PVC) tube.[7] Contemporary reviews underscore that these risks persist and that disciplined preventive strategies—control of inspired oxygen, cuff protection, and structured communication—remain central to modern airway-fire prevention.[1,8] We report an intraoperative airway fire that occurred during left pneumonectomy for central lung cancer, the first such case in the history of our hospital, and we analyze its mechanism, management, and prevention.

Case presentation

History and physical examination

A 70-year-old man was admitted with a pulmonary shadow that had been detected incidentally on health examination. His medical history was notable for a long history of smoking, type 2 diabetes mellitus of more than 20 years' duration managed with oral antidiabetic agents and insulin, and newly diagnosed hypertension. Chest computed tomography revealed a centrally located carcinoma of the left-lower-lobe basal segment extending along the bronchovascular bundle toward the hilum. Thoracoscopic left lower lobectomy was planned. Physical examination was otherwise unremarkable.

Preoperative assessment and anesthetic plan

At preoperative evaluation the patient was assessed as American Society of Anesthesiologists (ASA) physical status II (ASA II), with no contraindications to surgery. Because lung isolation was required, a left DLT was selected, with reserve single-lumen tubes and airway adjuncts (video laryngoscope, flexible fiberoptic bronchoscope, stylets) immediately available.

Anesthesia and the intraoperative course

After induction and preoxygenation to an end-tidal oxygen fraction above 0.9, a left DLT was placed on the first attempt without difficulty. Flexible fiberoptic bronchoscopy, however, revealed an exophytic tumor protruding close to the tip of the left tube, indicating that the tumor had progressed beyond the preoperative assessment and had infiltrated the airway close to the orifice of the left main bronchus. After discussion with the surgical team and in view of the patient's cardiopulmonary reserve, the plan was changed to left pneumonectomy, and the DLT was withdrawn as far as was safely possible.

Anesthesia was maintained with total intravenous anesthesia at an inspired oxygen fraction (FiO_2) of 1.0. Surgery began at 12:15 with thoracoscopic exploration, which was converted to open thoracotomy 15 minutes later (12:30); the operation took place on 30 June 2022 and ended at 15:45.

The airway fire. At 13:26, while the surgical team was dividing the left main bronchus, sudden flame and smoke appeared within the airway, indicating combustion of the double-lumen tube.[9] The fire was recognized immediately; surgery was paused and oxygen was disconnected. Because the distal tip of the left DLT lay extremely close to the operative field, the heat of high-energy monopolar electrosurgery perforated and melted the left cuff; lung isolation then failed, oxygen accumulated, and the DLT ignited. When ventilation was resumed, mechanical ventilation proved difficult, and inspection revealed leakage of the left cuff. The DLT was withdrawn into the main airway, but the tracheal lumen was occluded by diffuse black carbonized deposits that could not be cleared by suction. The retrieved tube and the associated suction devices, together with the three elements of the fire triad met in this case, are shown in Fig. 1.

Rebuilding the airway. After the fire, peripheral oxygen saturation (SpO_2) declined progressively from 100% to 95%, 85%, and then 82%. The DLT was now nonventilatable, and, given the thorough advanced-airway preparation, we decisively removed it and maintained oxygenation by face-mask positive-pressure ventilation. Inspection of the retrieved tube confirmed that the left tube and its cuff had been completely melted by heat, validating the decision. A reinforced single-lumen endotracheal tube (ETT) was then placed under video-laryngoscopic guidance in the right lateral decubitus position at a depth of about 24 cm from the incisors. Despite continuous positive-pressure ventilation, SpO_2 continued to fall, reaching a transient nadir of 33%. Once the still-open left main-bronchial stump had been closed on the field, SpO_2 rose progressively to 82% and then 100% and remained stable. Arterial blood gas analysis at that time showed pH 7.32, PaO_2 494 mmHg, and $PaCO_2$ 58 mmHg on FiO_2 1.0; the respiratory acidosis was corrected by ventilator adjustment.

Bronchoscopic assessment, airway lavage, and completion of surgery

Before chest closure, fiberoptic bronchoscopy showed red, edematous mucosa of the main airway with diffuse black carbonized deposits over the carina and both main bronchi, the right bronchial tree also being involved. Because these deposits could not be cleared by suction, lavage was performed under bronchoscopic guidance using room-temperature normal saline to wash out the deposited material, lower the risk of postoperative infection, and provide local cooling; four lavage passes delivered approximately 400 mL, with approximately 350 mL aspirated. The appearance of the airway at different levels before the first lavage is shown in Fig. 2**(a–c)**. The patient was transferred, still intubated, to the surgical intensive care unit.

Postoperative course and follow-up

After chest closure, the patient was transferred to the surgical intensive care unit (SICU), where he remained intubated. Bronchoscopically guided lavage was continued intermittently, and at 18:00 on 1 July 2022—approximately 26 hours after the end of surgery—bronchoscopy disclosed copious mucoid secretions and mucus plugs obstructing the right bronchial lumen; these were cleared by suction. The corresponding bronchoscopic findings at different levels after the third (final) lavage are shown in Fig. 2**(d–f)**. The tracheal tube was removed uneventfully at 21:00 on 1 July 2022 (the first postoperative day).

On the second postoperative day (2 July 2022) the patient was transferred back to the general ward. A transient new-onset atrial fibrillation developed on that day, consistent with a systemic inflammatory and sympathetic surge; after rate-control and anticoagulation management, sinus rhythm was restored. Chest imaging performed on postoperative day 5 and at 2.5 months postoperatively showed progressive resolution of the pulmonary changes (Fig. 3). He was discharged on 7 July 2022 (the seventh postoperative day). Histopathology performed at the outpatient review after discharge confirmed keratinizing squamous cell carcinoma (pT4N2M0, stage IIIB), and he was admitted to the Department of Respiratory Medicine for standardized chemotherapy. He completed five cycles of chemotherapy on 2 February 2023 and was subsequently followed up locally. At the time of writing, he was being followed up by intermittent telephone contact; he reported intermittent cough and sputum production but was generally able to carry out the activities of daily living.

Discussion

Mechanisms of the airway fire: the fire triad

Fire requires a fuel, an oxidizer, and an ignition source; the operating room is therefore a high-risk environment.[2] Within the airway a locally oxygen-enriched atmosphere renders ignition more likely.[10] PVC, the material of conventional tracheal tubes, can burn once the oxygen fraction exceeds about 0.25–0.26,[7] and most reported fires begin in the cuff or the tube tip.[9,11] Experimental data further show that a fire can occur even without an obvious gas leak, because heat conducted through the tube shaft can by itself initiate combustion.[3,6]

In our patient, tumor progression was recognized intraoperatively and the surgical plan was changed to pneumonectomy. As a result, the operative field lay extremely close to the distal end of the left DLT. During the use of high-energy monopolar electrosurgery the left cuff was heated, perforated, and melted; lung isolation then failed, oxygen accumulated, and all three elements of the fire triad were present, so the DLT ignited. The circumstances that brought these elements together carry two practical lessons for prevention. The first concerns anticipation: an intraoperative change of surgical plan can relocate the operative field onto the airway tube without the anesthetic team being aware, so communication at such a moment is essential. The second concerns detection: because thermal injury may develop without an

obvious gross leak, the first sign of a fire can be flame and smoke on the field rather than a detectable gas leak.

Why a pneumonectomy fire is uniquely dangerous

Most reported airway fires complicate tracheostomy or head-and-neck procedures, in which the tube can usually be removed and the airway re-established while a patent tracheobronchial tree is preserved, with eventual full recovery.[4,11,12] A fire during pneumonectomy differs fundamentally, and the difference lies in what a rescue attempt must contend with at the moment it is made. Ignition occurs precisely at the moment of bronchial division, while the surgeon is actively dissecting the airway. Because the left main bronchus has already been divided, the left lung cannot participate in gas exchange, and the entire ventilatory strategy collapses onto a single ventilatable main airway at the very time when oxygen demand is greatest during an open-chest anesthetic. The large tracheobronchial surface exposed to the oxygen-enriched electrosurgical field increases the extent of thermal and inhalational injury, and the mandatory lateral surgical position compounds the difficulty of rescue once the bronchial stump is already open. These features invalidate the simple sequence of "cease ventilation, remove the tube, reintubate": although the burning tube must be removed, reintubation alone cannot restore oxygenation until the open bronchial stump is closed, and the transient low SpO_2 in our patient illustrates how rapidly reserve is exhausted in this setting.

Principles of management and their application

The two features just described—onset at the moment of bronchial division, and dependence on a single ventilatable airway—also dictate how this fire must be managed. Management of an intraoperative airway fire follows a well-defined sequence: (1) discontinue the oxidizer and remove the ignition source; (2) extinguish and remove the burning material; (3) restore oxygenation and ventilation through a secure airway; (4) stabilize the circulation; and (5) evaluate and treat thermal injury, inhalational injury, and possible post-hypoxic sequelae.[1,13,14] Each step required adaptation in our patient.

Immediate steps. Oxygen was disconnected and surgery suspended as soon as the fire was recognized, and the flame subsided without spreading.[1] With the immediate danger contained, attention shifted to the airway itself.

Airway rescue. Removal of the burning DLT was mandatory,[1,15] but it was not sufficient on its own. The bronchial stump was still open, so conventional reintubation could not immediately restore ventilation. We therefore maintained oxygenation transiently with face-mask positive-pressure ventilation between tube removal and reintubation, then rebuilt the airway with a reinforced single-lumen tube.[6] A careful diagnostic pathway—verifying tube position, then the breathing circuit, then conferring with the surgeon—identified the unclosed bronchial stump as the cause of the refractory desaturation, which resolved once the stump was closed. This highlights the need to consider the surgical field itself as a cause of

hypoxemia after airway-fire rescue, and to have vasopressors and volume immediately available for the associated sympathetic and hypoxic stress.

Airway and inhalational-injury management. Once the airway had been secured, attention turned to limiting the consequences of the thermal and inhalational injury itself. High-dose intraoperative glucocorticoids were administered to suppress airway inflammation,[12] and bronchoscopic saline lavage—four passes intraoperatively and a further three before extubation—served three purposes: mechanical clearance of carbonized debris; local cooling of the thermally injured mucosa, thereby limiting progression of thermal injury; and reduction of the risks of infection and later airway obstruction.[12,16] The progressive clearing documented at that examination permitted uneventful early extubation without neurological deficit. Extubation was deliberately timed, because edema from airway thermal injury generally peaks 24–48 hours after the insult; re-examination on the first postoperative day, which confirmed the absence of active bleeding and severe edema before tube removal, avoided urgent reintubation precipitated by laryngeal edema or retained secretions. Because combustion of a PVC tube also releases irritant or asphyxiant products—notably hydrogen chloride and carbon monoxide[5]—arterial blood gases and lactate were monitored serially in the early postoperative period to detect smoke-related chemical toxicity. No abnormality attributable to inhalation injury was observed. The transient new-onset atrial fibrillation was consistent with a systemic inflammatory and sympathetic surge and resolved after rhythm and anticoagulation management. Data on bronchodilators and inhaled corticosteroids after airway fire remain limited; although their use to aid recovery appears plausible, the question merits further study.

Long-term outcome. Management continued well beyond the operating room, and the follow-up period proved as informative as the acute event. The patient was followed up locally after completing five cycles of maintenance chemotherapy on 2 February 2023 and, at the time of writing, by intermittent telephone contact. He reported intermittent cough and sputum production but was generally able to carry out the activities of daily living, with no clinically significant airway stenosis. He also reported hoarseness that had persisted for two months postoperatively without full resolution; specialist consultation considered unilateral vocal cord paralysis. Because the operation was performed on the left side, the left recurrent laryngeal nerve—a branch of the vagus nerve—was directly within the operative field, since it loops beneath the aortic arch and runs through the region of the left mediastinal lymph-node dissection. Injury to this nerve during surgery is therefore the most plausible explanation.[17,18] Unilateral laryngeal paralysis is a recognized complication of pulmonary resection with mediastinal lymph-node dissection, and large series of left lung resection have reported vocal cord dysfunction in over 30% of patients, in whom it is associated with more pulmonary and cardiac complications and a longer hospital stay;[18,19] dysphonia and impaired glottic closure after recurrent laryngeal nerve injury may also predispose to aspiration.[17] At the time of writing the hoarseness persisted but did not affect daily living, and the patient and family declined further investigation or treatment. Because the right main bronchus subserves the sole remaining lung, we specifically watched for sequelae that might be masked by a healed mucosa—in particular tracheomalacia and impaired mucociliary clearance. This concern was already evident 26 hours after surgery, when bronchoscopy showed a large amount of mucoid secretion

with mucus plugs obstructing the right bronchial lumen, requiring suction clearance; together with the patient's ongoing productive cough, this was consistent with impaired mucociliary clearance after thermal injury.

Prevention

The difficulties encountered in managing this fire point directly to what might have prevented it. Prevention rests on breaking the triad before and during bronchial division.[1,8] Drawing on institutional and international cognitive aids for airway procedures, and on experimental and clinical evidence together with published recommendations, we recommend that during lung resection—particularly when the operative field may come close to the airway tube—the following measures be adopted whenever feasible:

- **Choice and protection of the lung-isolation device.** Select a device positioned so that its cuff and tip lie outside the surgical and electrosurgical zone—a DLT with its tip in the healthy (right) main bronchus or, where feasible, a laser-resistant tube.[16,20] Fill the cuff with colored saline rather than air to allow early detection of cuff perforation and to provide local cooling.[1,16]
- **Control of the oxidizer and the ignition source.** Before and during division of the airway—and, more broadly, whenever an open-airway resection is anticipated—reduce the inspired oxygen concentration to the lowest level that maintains oxygen saturation at or above 90% (in practice often ≤ 30%); where feasible, briefly ventilate with air and clear residual high-concentration oxygen from the airway before dissection begins.[7,10] Nitrous oxide, which behaves as an oxidizer, should be avoided.[7] When working close to the airway, surgeons should prefer cold instruments or low-energy intermittent cautery, protect the cuff with wet gauze, and maintain continuous negative-pressure suction within the field to limit the accumulation of oxygen and flammable debris.[3,13]
- **Communication.** Sustained, effective communication between the anesthesiologist and the surgeon—particularly when the surgical plan changes and when the bronchus is about to be divided[11,21]—is the single most important safeguard. Institutional cognitive aids and rehearsal of the airway-fire checklist reinforce a rapid, coordinated response.[1,8] Because fires related to electrosurgery continue to occur, and knowledge gaps about electrosurgical hazards remain common even among experienced surgeons, structured team training and heightened intraoperative vigilance remain necessary.[22]

Even when these measures are respected, an airway fire cannot be entirely avoided. No currently available tracheal tube—including laser-resistant tubes—guarantees absolute protection under these conditions.[16,20] Once the rare flame appears, calm, correct, and rapid judgment, acting within seconds, is decisive.[14] When thermal injury to the airway does occur, principles established for inhalation injury are directly relevant: early bronchoscopic assessment, repeated saline lavage to remove soot, carbonized debris, and secretions, and meticulous pulmonary toilet—these remain the mainstay of airway care.[5,23]

Limitations

As a single case report, this account cannot quantify risk or establish that any individual intervention independently improved the outcome; it illustrates a coherent, staged management approach, and certain details are presented as documented by the treating team. Objective tests of mucociliary function and formal tracheomalacia assessment were not performed. Nevertheless, the rarity of fire complicating pneumonectomy, and the favorable and durable outcome after a near-fatal event, justify detailed reporting.

Conclusion

We report the successful management of an intraoperative airway fire that occurred during left pneumonectomy for central squamous cell carcinoma—a rarely described and uniquely hazardous scenario in which a divided bronchial stump, lateral surgical positioning, and complete dependence on a single ventilatable main airway at a high inspired oxygen concentration coexisted. A staged response comprising immediate cessation of oxygen and surgery, decisive removal of the burning tube, deliberate re-establishment of a ventilatable airway, aggressive bronchoscopic saline lavage, glucocorticoid pulse therapy, and supportive postoperative care led to early extubation, recovery, and a favorable outcome. Airway fire should be anticipated whenever high-energy electrosurgery is applied close to an airway tube in an oxygen-enriched field—including during major pulmonary resection—and a rehearsed, multidisciplinary management algorithm, together with disciplined communication, is essential.

CARE Checklist

This case report was prepared in accordance with the CARE (CAse REport) reporting guideline; the completed checklist is supplied as Additional file 1.

Declarations

Ethics approval and consent to participate. This case report was prepared in accordance with the Declaration of Helsinki and the CARE reporting guideline. Institutional ethics approval is not required for a single case report, and written informed consent was obtained from the patient for participation.

Consent for publication. Written informed consent for publication of this case report and any accompanying images was obtained from the patient.

Availability of data and materials. All data generated or analysed during this study are included in this published article.

Competing interests. The authors declare that they have no competing interests.

Funding. No external funding was received for this work.

Authors' contributions. Yang Zhang and Tong Meng provided anesthetic care and collected the data; Jiandong Gao supervised the anesthetic and perioperative management and revised the manuscript.

Yang Zhang drafted the manuscript, and all authors reviewed and approved the final version.

Acknowledgements. Not applicable.

Clinical trial number. Not applicable.

References

1. Apfelbaum JL, Caplan RA, Barker SJ, et al. Practice advisory for the prevention and management of operating room fires: an updated report by the American Society of Anesthesiologists Task Force on Operating Room Fires. *Anesthesiology*. 2013;118(2):271–290.
2. Jones TS, Black IH, Robinson TN, Jones EL. Operating room fires. *Anesthesiology*. 2019;130(3):492–501.
3. Cowles CE Jr, Culp WC Jr. Prevention of and response to surgical fires. *BJA Education*. 2019;19(8):261–266.
4. Tykocinski M, Thomson P, Hooper R. Airway fire during tracheotomy. *ANZ J Surg*. 2006;76(3):195–197.
5. Sheridan RL. Fire-related inhalation injury. *N Engl J Med*. 2016;375(5):464–469.
6. Shin YD, Lim SW, Bae JH, Yim KH, Sim JH, Kwon EJ. Wire-reinforced endotracheal tube fire during tracheostomy—a case report. *Korean J Anesthesiol*. 2012;63(2):157–160.
7. Wolf GL, Simpson JI. Flammability of endotracheal tubes in oxygen and nitrous oxide enriched atmospheres. *Anesthesiology*. 1987;67(2):236–239.
8. Beaulieu F, Hobday S, Duffy CC. Fire risks in airway procedures. *Anesthesiology Clin*. 2026;44(1):115–124.
9. Marsh B, Riley RH. Double-lumen tube fire during tracheostomy. *Anesthesiology*. 1992;76(3):480–481.
10. Remz M, Luria I, Gravenstein M, Rice SD, Morey TE, Gravenstein N, Rice MJ. Prevention of airway fires: do not overlook the expired oxygen concentration. *Anesth Analg*. 2013;117(5):1172–1176.
11. Rogers SA, Mills KG, Tufail Z. Airway fire due to diathermy during tracheostomy in an intensive care patient. *Anaesthesia*. 2001;56(5):441–446.
12. Salaria ON, Suthar R, Abdelfattah S, Hoyos J. Intraoperative and postoperative management of a case of an airway fire. *A A Case Rep*. 2017;9(2):51–56.
13. Rogers ML, Nickalls RWD, Brackenbury ET, Salama FD, Beattie MG, Perks AGB. Airway fire during tracheostomy: prevention strategies for surgeons and anaesthetists. *Ann R Coll Surg Engl*. 2001;83(6):376–380.
14. Akhtar N, Ansar F, Baig MS, Abbas A. Airway fires during surgery: management and prevention. *J Anaesthesiol Clin Pharmacol*. 2016;32(1):109–111.
15. Chee WK, Benumof JL. Airway fire during tracheostomy: extubation may be contraindicated. *Anesthesiology*. 1998;89(6):1576–1578.

16. Roy S, Smith LP. Prevention of airway fires: testing the safety of endotracheal tubes and surgical devices in a mechanical model. *Am J Otolaryngol*. 2015;36(1):63–66.
17. Koyanagi K, Igaki H, Iwabu J, Ochiai H, Tachimori Y. Recurrent laryngeal nerve paralysis after esophagectomy: respiratory complications and role of nerve reconstruction. *Tohoku J Exp Med*. 2015;237(1):1–8.
18. Laccourreye O, Malinvaud D, Delas B, Bonfils P, Crevier-Buchman L, Ménard M, Souilamas R. Early unilateral laryngeal paralysis after pulmonary resection with mediastinal dissection for cancer. *Ann Thorac Surg*. 2010;90(4):1075–1078.
19. Filaire M, Mom T, Laurent S, Harouna Y, Naamee A, Escande G, et al. Vocal cord dysfunction after left lung resection for cancer. *Eur J Cardiothorac Surg*. 2001;20(4):705–711.
20. Roy S, Smith LP. Surgical fires in laser laryngeal surgery: are we safe enough? *Otolaryngol Head Neck Surg*. 2015;152(1):67–72.
21. Gorphe P, Sarfati B, Janot F, Bourgain JL, Motamed C, Blot F, Temam S. Airway fire during tracheostomy. *Eur Ann Otorhinolaryngol Head Neck Dis*. 2014;131(3):197–199.
22. El-Sayed SM, Saridogan E, El-Sayed MM. Complications of electrosurgery: mechanisms and prevention strategies. *Facts Views Vis Obgyn*. 2024;16(4):473–484.
23. Walker PF, Buehner M, Wood L, Boyer N, Driscoll IR, Lundy JB, et al. Diagnosis and management of inhalation injury: an updated review. *Crit Care*. 2015;19:351.

Figures

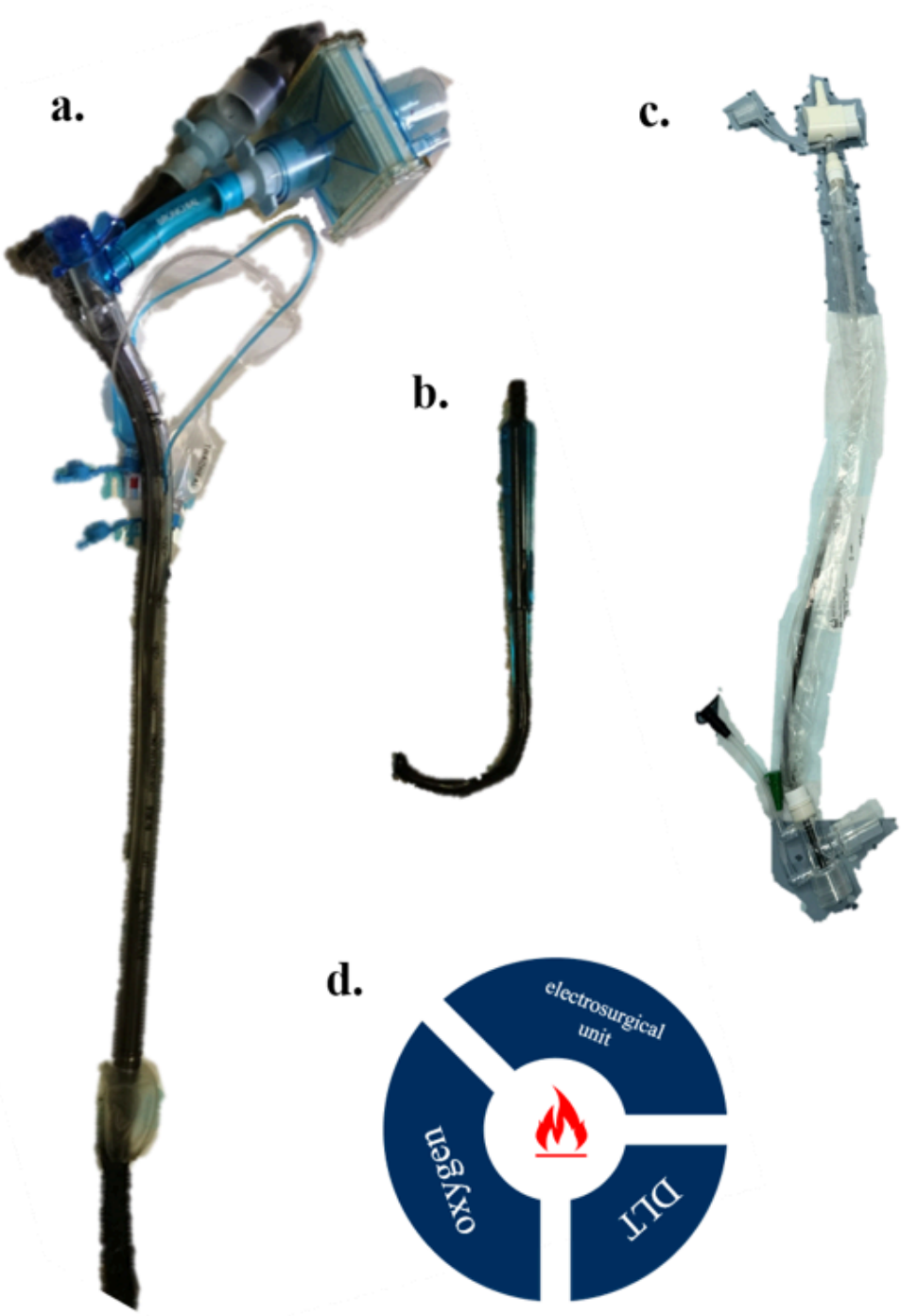


Figure 1

Intraoperative views of the airway fire. (a) The charred double-lumen endotracheal tube (DLT) after intraoperative ignition. (b) The suction tubing on the sterile field. (c) The suction catheter off the field. (d) The three components of the fire triad that were simultaneously present in this case: the electrosurgical unit (ignition source), oxygen (oxidizer), and the double-lumen endotracheal tube (fuel).

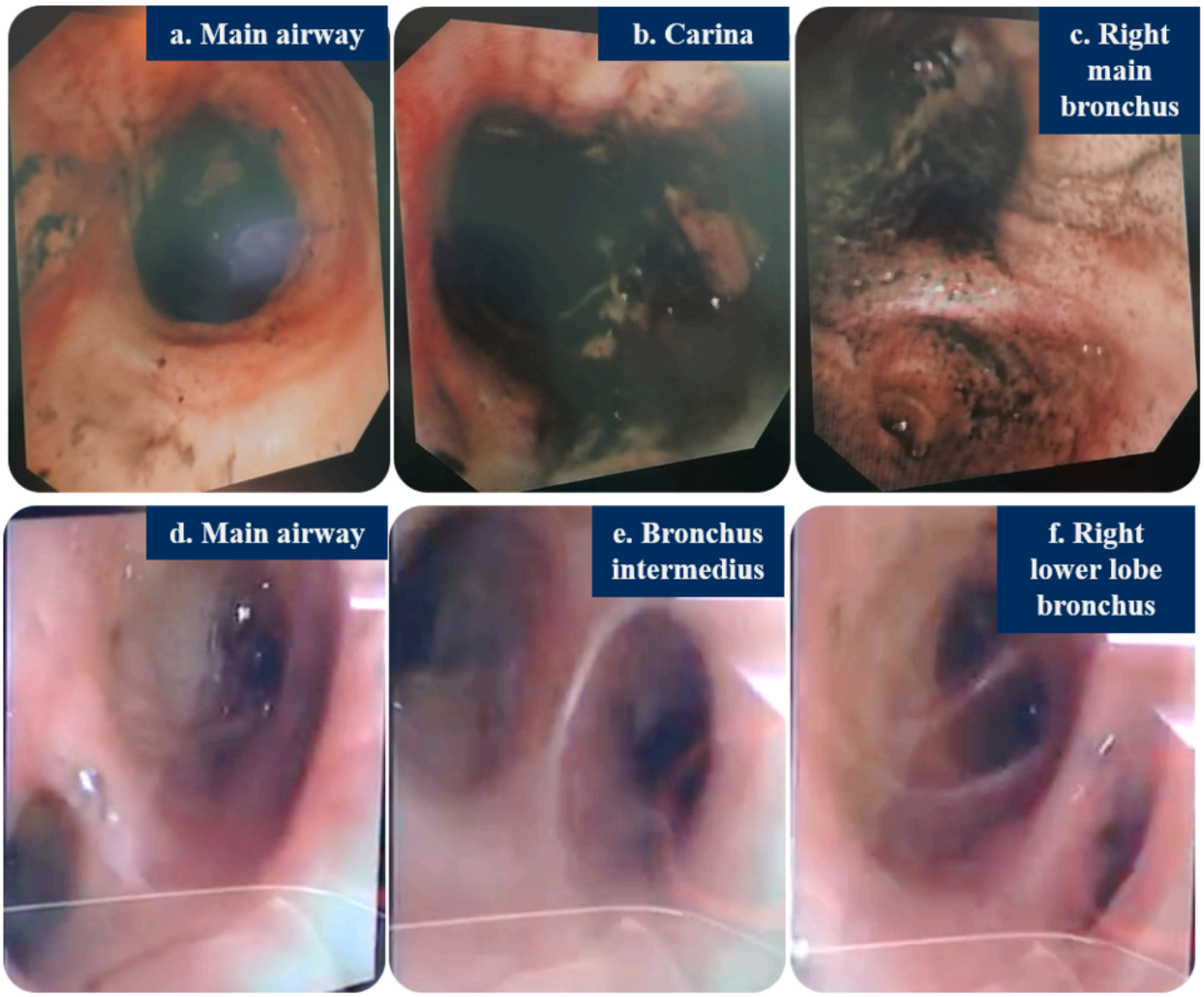


Figure 2

Bronchoscopic images of different airway levels before the first intraoperative airway lavage (a–c) and after the third (final) postoperative airway lavage (d–f). (a) Main airway. (b) Carina. (c) Right main bronchus. (d) Main airway. (e) Bronchus intermedius. (f) Right lower lobe bronchus.

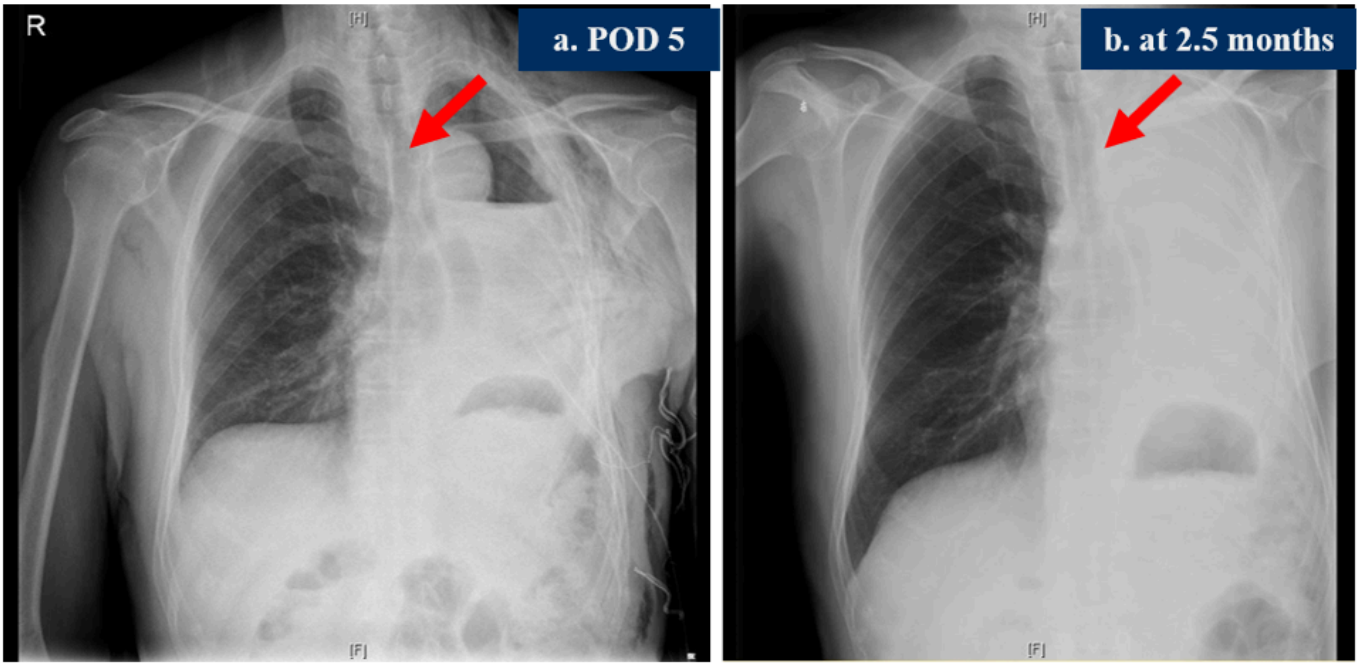


Figure 3

Chest radiographs obtained on postoperative day 5 (a) and at 2.5 months postoperatively (b), showing progressive resolution of the pulmonary changes.