



## Clinical images

### Endobronchial Closure of Bronchopleural Fistulas Using Patent Foramen Ovale Occluder and Patent Ductus Arteriosus Occluder



Cierre por vía broncoscópica de fístulas broncopleurales mediante colocación de dispositivo ocluidor de foramen oval permeable e dispositivo ocluidor de conducto arterioso persistente

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A 46-year-old female underwent a right upper lobectomy, requiring totalizing pneumonectomy due to recurrent adenocarcinoma, complicating with a right bronchopleural fistula (BPF). Due to the patient's poor general condition, surgical repair was not possible. Endoscopic treatment with trichloroacetic acid and N-butyl cyanoacrylate glue was unsuccessful. Given the bronchial stump's diameter and length, it was impossible to safely place an endobronchial stent, coils, spigots, or an emphysema valve. Due to recurrent empyema, it was decided to perform a bronchoscopic closure of the fistula using Amplatzer™ devices. The bronchoscopy showed a BPF of 2 mm in the right upper bronchial stump and a second BPF of 6 mm in the right lower bronchial stump (Fig. 1A and B). An Amplatzer™ PFO Occluder (Patent Foramen Ovale Occluder) with 18 mm was placed in the BPF of the right lower

bronchial stump, and an Amplatzer™ Duct Occluder II (Patent Ductus Arteriosus Occluder) with 4 mm was placed in the BPF of the right upper bronchial stump, both showing occlusion of the fistulas (Fig. 1C and D). The patient presented an improvement in her clinical status. The bronchoscopic reevaluation in two months showed both devices in place, with complete occlusion of the BPF.

BPF are uncommon complications of lobectomy and pneumonectomy, presenting high morbidity and mortality (16–71%).<sup>1,2</sup> Endobronchial closure of BPF using PFO Occluders is a safe, minimally invasive, and promising method for postoperative BPF.<sup>1,2</sup> This technique can be lifesaving for patients with recurring empyema and those in poor general condition without a surgical option.

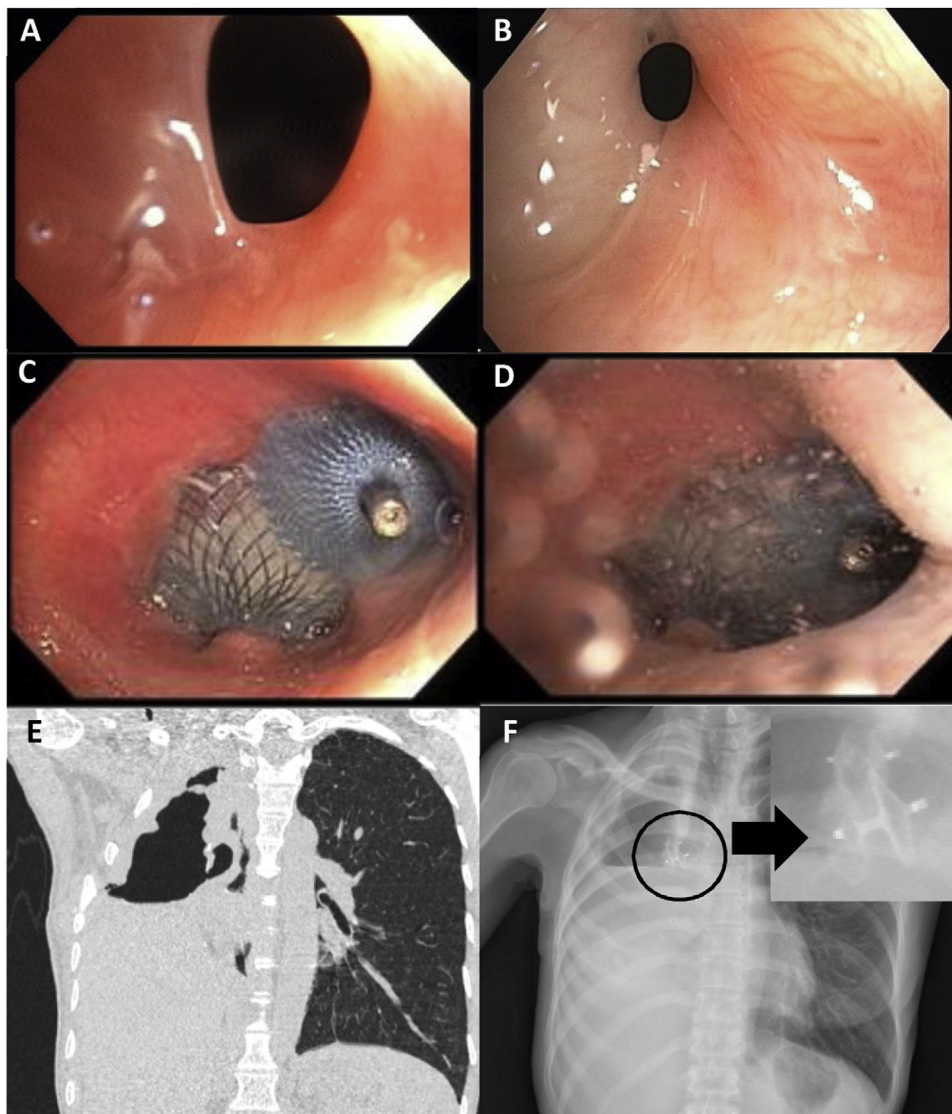
**Abbreviations:** BPF, bronchopleural fistula; PDA, Patent Ductus Arteriosus; PFO, Patent Foramen Ovale.

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**Fig. 1.** (A and B) Endoscopic view of BPF with 6 mm in the right lower bronchial stump (A) and BPF with 2 mm in the right upper bronchial stump (B). (C and D) Endoscopic view of PFO Occluder and Duct Occluder with complete occlusion of the BPF of the right lower and right upper bronchial stump, respectively. (E) Chest computed tomography demonstrates the BPF of the right bronchial stump. (F) Chest radiograph shows both devices in place.

### Informed consent

Informed consent was obtained from the patient to publish this case report and any accompanying images.

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None declared.

### Authors' contributions

IB participated in data collection, writing, and revising the manuscript. FGO participated in writing and revising the manuscript. PM participated in the patient's treatment, data collection, writing, and revising the manuscript. All authors read and approved the final manuscript.

### Conflicts of interest

All authors declare that they have no conflicts of interest to disclose.

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### References

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