CLINICAL IMAGE

# Optical coherence tomography of inoperable chronic thromboembolic pulmonary hypertension treated with refined balloon pulmonary angioplasty

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Chronic thromboembolic pulmonary hypertension (CTEPH) usually results from the chronic obstruction of the pulmonary arteries by unresolved thromboemboli following acute pulmonary embolism. Surgical pulmonary endarterectomy is the first-line therapy in CTEPH; however, some patients are inoperable because of high perioperative risk or distal localization of thrombi. Balloon

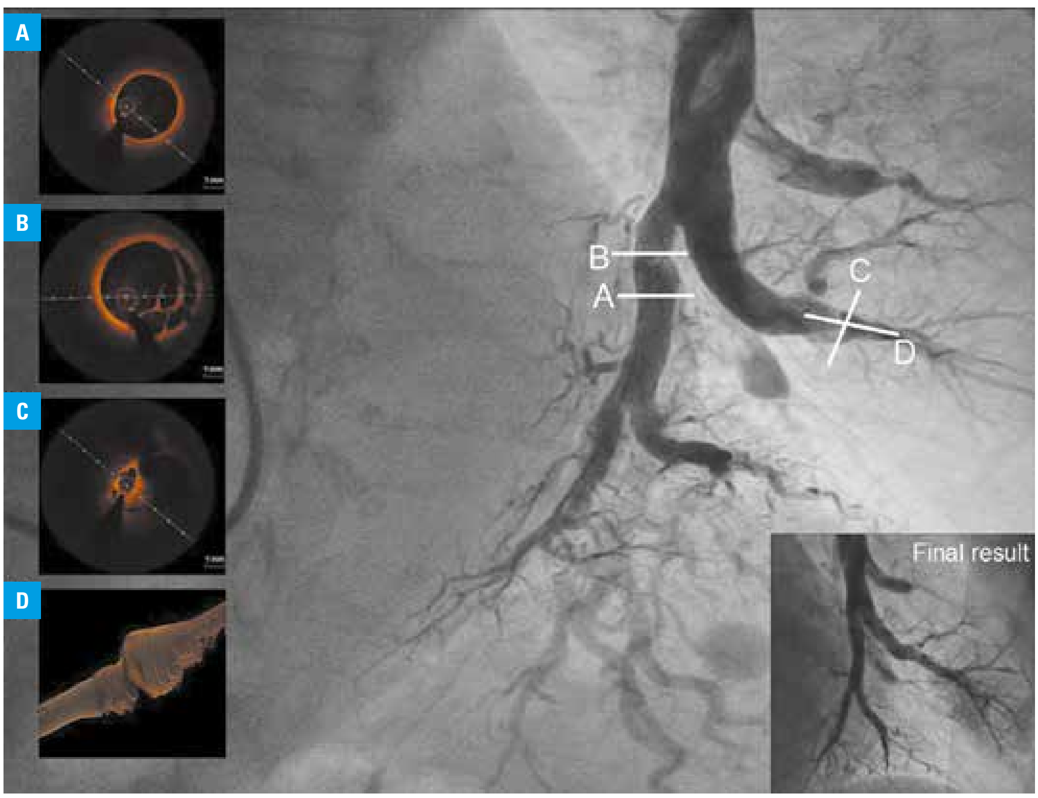


**FIGURE 1** Optical coherence tomography (OCT) of the pulmonary arteries in a patient with chronic thromboembolic pulmonary hypertension treated with balloon pulmonary angioplasty; **A** – pulmonary artery with no lesion; **B** – luminal flaps (webs/meshwork) of the segmental artery of the left lower lobe; **C** – thrombotic occlusion of the artery; **D** – 3-dimensional OCT of the lesion before BPA; the final angiographic result of BPA of the left pulmonary artery is shown in the lower right corner (note a marked improvement of peripheral blood flow distally to the treated lesion).

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pulmonary angioplasty (BPA), a new emerging therapy supported by growing clinical evidence, has been adopted in this group of patients.[1] Recently, the use of refined BPA with novel imaging modalities has been reported, which has markedly improved the efficacy and safety of BPA.[2,3] Optical coherence tomography (OCT) is a novel, promising tool that has been reported to be useful in the diagnosis and management of CTEPH.[4]

We present a case of an 80-year-old woman with CTEPH who was admitted to our department for the next stage of refined BPA. Right heart catheterization confirmed severe pulmonary hypertension (mean pulmonary artery pressure, 49 mmHg) and pulmonary angiography revealed distal CTEPH. To prevent severe complications such as reperfusion pulmonary edema or artery perforation, we performed OCT-guided refined BPA. Based on OCT measurements (lumen size, lesion length) and imaging (lesion type: webs, slits, or ring-like stenosis; **FIGURE 1A–C**), we used properly sized balloons (monorail balloon catheter, Pantera 3.5 × 15 mm, Biotronik, Bülach, Switzerland). Furthermore, 3-dimensional OCT allowed us to assess the morphology of the obstructive lesion of the segmental pulmonary artery (**FIGURE 1D**). The final result of OCT-guided BPA was satisfying (**FIGURE 1**, the lower right corner). The in-hospital course after BPA was uneventful and the patient was discharged with improved functional capacity.

OCT was useful in that it allowed us to precisely determine the location of the target lesions of the pulmonary arteries (intravascular web, meshwork, slits). Moreover, it allowed us to assess the lesions and choose the appropriate balloon size and length. Therefore, in our opinion, OCT-guided BPA shows improved efficacy and safety, and we suggest that it should be used routinely during BPA. However, our findings need to be confirmed in large studies.

## REFERENCES


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