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Percutaneous Transluminal Pulmonary Angioplasty for Central-Type Chronic Thromboembolic Pulmonary Hypertension

Haruhisa Ishiguro, MD,* Masaharu Kataoka, MD,*† Takumi Inami, MD,* Ryoji Yanagisawa, MD,* Nobuhiko Shimura, MD,* Hiroki Taguchi, MD,* Hideyasu Kohshoh, MD,* Hideaki Yoshino, MD,* Toru Satoh, MD*

Tokyo, Japan

A 76-year-old man had severe pulmonary artery stenosis in the main tract of the right pulmonary artery (Fig. 1, Online Video 1), suggesting central-type chronic thromboembolic pulmonary hypertension (CTEPH). Percutaneous transluminal pulmonary angioplasty (PTPA) was strategized because he was excluded from surgical pulmonary endarterectomy due to his severe chronic obstructive pulmonary dysfunction and poor physical condition.

The procedure was divided into 2 staged sessions performed on different days so as to prevent large-scale pulmonary edema due to acute revascularization. During the first session, the right pulmonary artery was incompletely dilated using a 2.5- to 6-mm monorail balloon catheter (Figs. 2A and 2B). The first PTPA session was stopped in an insufficient state of pulmonary flow (Fig. 2C). One week later, the mean pulmonary arterial pressure (PAP) had decreased to 29 mm Hg just before the second session (baseline, 41 mm Hg). The main lesion was dilated further using a 10-mm balloon catheter, and pulmonary blood flow was significantly improved, with rapid increases in flow (Figs. 3A and 3B, Online Video 2). No major complications, including reperfusion pulmonary edema, occurred. There was no pulmonary restenosis seen on 6-month follow-up (mean PAP 23 mm Hg).

Patients with central-type CTEPH have been excluded from PTPA because it would have resulted in large-scale pulmonary edema, with grave consequences in terms of morbidity and mortality (1,2). However, we have demonstrated that staged revascularization by PTPA is effective in the treatment of central-type CTEPH and therefore may be a therapeutic option for these patients.

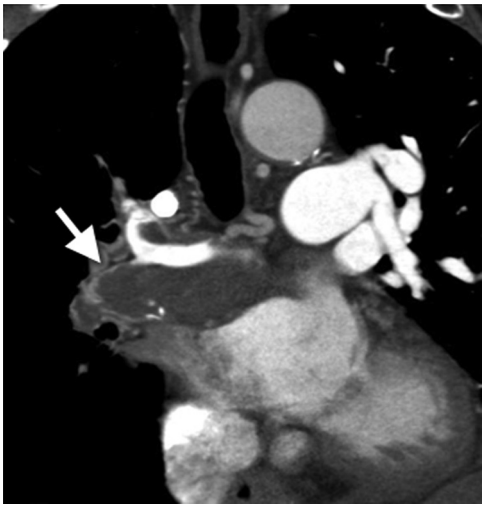

Figure 1. Chest Computed Tomography Before PTPA

Arrow indicate a large thrombosis in the main tract. PTPA = percutaneous transluminal pulmonary angioplasty (Online Video 1).

From the *Division of Cardiology, Second Department of Internal Medicine, Kyorin University School of Medicine, Tokyo, Japan; and the †Department of Cardiology, Keio University School of Medicine, Tokyo, Japan. The authors have reported that they have no relationships relevant to the contents of this paper to disclose. Drs. Ishiguro and Kataoka contributed equally to this work.

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Reprint requests and correspondence: Drs. Toru Satoh or Masaharu Kataoka, Division of Cardiology, Department of Medicine, Kyorin University School of Medicine, 6-20-2, Shinkawa, Mitaka, Tokyo 181-8611, Japan. E-mail: tsatoh@ks.kyorin-u.ac.jp; or m.kataoka09@gmail.com.

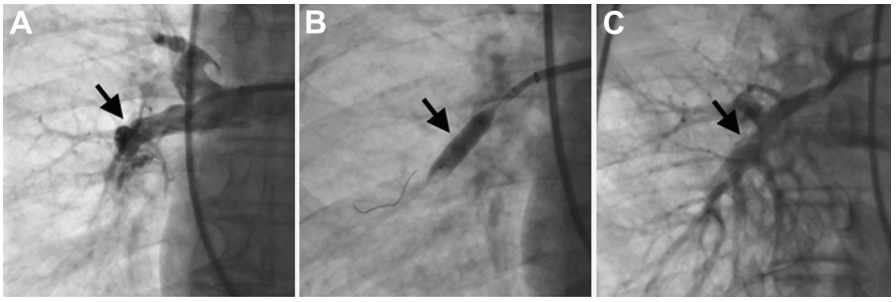

Figure 2. Angiographies at the First Session

Angiographies before PTPA **(A)**, during dilation of the target lesion by the small-size balloon catheter **(B)**, and after the first session of PTPA **(C)**. Abbreviations as in Figure 1.

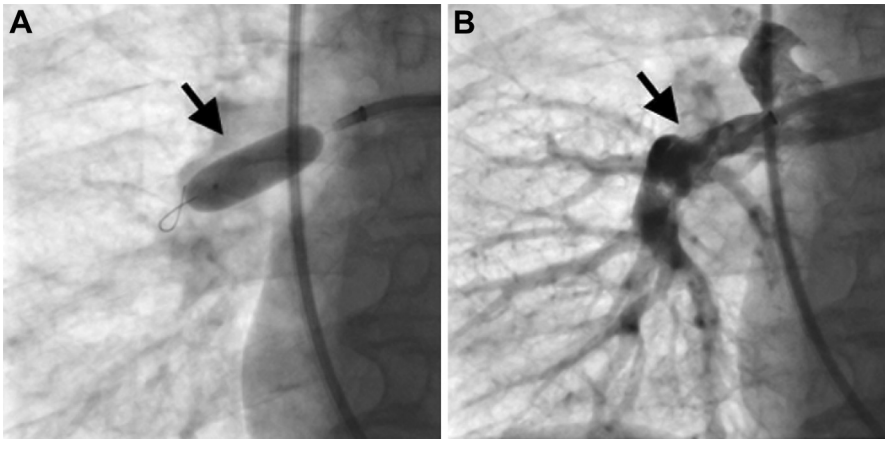

Figure 3. Angiographies at the Second Session

Angiographies during dilation by a larger balloon catheter **(A)** and after the second session of PTPA **(B)**. Abbreviations as in Figure 1 (Online Video 2).

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Key Words: balloon pulmonary angioplasty ■ chronic thromboembolic pulmonary hypertension ■ percutaneous transluminal pulmonary angioplasty.

APPENDIX

For accompanying videos, please see the online version of this paper.