

**Pressure-wire-guided Percutaneous Transluminal Pulmonary
Angioplasty: a Breakthrough in the Catheter-interventional Therapy
for Chronic Thromboembolic Pulmonary Hypertension**

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Objectives: Percutaneous Transluminal Pulmonary Angioplasty (PTPA) has been demonstrated to be effective for treatment of chronic thromboembolic pulmonary hypertension (CTEPH). However, a major and occasionally-fatal complication after PTPA is reperfusion pulmonary edema (RPE). To avoid it, pulmonary edema predictive scoring index (PEPSI) was invented by us. The pressure wire has been used to detect insufficiency of flow in the vessel. The objective of this study was to prove safety and effectiveness of pressure-wire-guided PTPA.

Methods: We included 350 consecutive PTPA sessions in 103 patients with CTEPH from January 2009 to December 2013. During this 5 years, 140 PTPA sessions were performed without any guidance, 65 with guidance of PEPSI alone, and 145 with guidance of PEPSI and pressure wire. Each PTPA session has been finished after fulfilling the PEPSI scores of less than 35.4 with guidance of PEPSI, and each target lesion fulfilling the distal mean pulmonary arterial pressure less than 35 mmHg with guidance of pressure wire.

Results: The occurrence of clinically critical RPE and vessel injuries were the lowest in the group with guidance of pressure wire and PEPSI (0% and 6.9%, respectively). Furthermore, the group with guidance of pressure wire and PEPSI accomplished the same hemodynamic improvements in fewer number of the target lesions treated and sessions performed.

Conclusions: Combined approach using pressure wire and PEPSI produced more efficient clinical results and greatly reduced RPE and vessel complications, and will make PTPA a standardized, safe and promising therapeutic strategy for CTEPH.