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Technical advances of pulmonary thromboendarterectomy for chronic thromboembolic pulmonary hypertension.

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OBJECTIVE: To minimize the side-effects of circulatory arrest times and profound hypothermia in patients undergoing pulmonary thromboendarterectomy (PTE) for chronic thromboembolic pulmonary hypertension (CTEPH).

METHODS: Between March 2000 and June 2002, 30 patients (in New York Heart Association (NYHA) class III or IV) were operated for CTEPH using our modified technique. It includes moderate hypothermic (28-32 degrees C), total cardiopulmonary bypass (CPB) and simultaneous selective antegrade cerebral perfusion and occlusion of the bronchial arteries by introducing an occlusive balloon catheter into the descending aorta. The preoperative pulmonary vascular resistance in the cohort was 873 ± 248 dynes/s/cm⁻⁵.

RESULTS: Mean total CPB, cross-clamp times and duration of antegrade cerebral perfusion were 132 ± 40 , 98 ± 21 and 21 ± 10 min, respectively. Mean core temperature 29.5 ± 1.9 degrees C. The duration of postoperative mechanical ventilatory support was 34 ± 44 h and the mean stay in the ICU was 5 ± 9 days. Seven patients had mild to moderate lung reperfusion injury, one transient neurological dysfunction. Three patients (10%) died during their hospital stay, two for multiorgan failure and one for persistent pulmonary hypertension. All patients had a significant pulmonary hemodynamic improvement and all achieved NYHA class I ($P < 0.01$) status 4 weeks after discharge, remaining stable at a median follow-up time of 16 months (range, 1-29 months) postoperatively.

CONCLUSIONS: These technical advances improve neurological outcome, control back-bleeding from bronchial arteries and avoid prolonged rewarming phases in patients undergoing PTE.