Acute effect of balloon pulmonary angioplasty for chronic thromboembolic pulmonary hypertension

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Background: Pulmonary endarterectomy is known to improve hemodynamics in the early postoperative period on chronic thromboembolic pulmonary hypertension (CTEPH). However, there are no reports of early hemodynamic changes after balloon pulmonary angioplasty (BPA) for CTEPH.

Purpose: The aim of this study was to clarify early hemodynamic changes of BPA. Furthermore, we investigated whether the early hemodynamic changes were related to the chronic phase hemodynamics after final BPA.

Methods: We retrospectively enrolled 43 consecutive CTEPH patients placed Swan-Ganz catheter for hemodynamic monitoring at first BPA. Hemodynamics were evaluated immediately before (Pre), immediately after (Post), 3 hours, 6 hours, 9 hours, 12 hours, and 1 week after BPA. The hemodynamics in the chronic phase after final BPA were confirmed in each group in which the mean pulmonary artery pressure (mPAP) did not decrease immediately after BPA and 12 hours later.

Results: Although mPAP improved immediately after BPA, no change were observed thereafter and significant improvement were observed after 6 hours (Figure). While, cardiac output rose immediately and reached a peak 6 hours later. Then, it decreased and returned to value of Post after 1 week (Figure). MPAP/CO continued to decrease after BPA until 12 hours later (Figure). There were 16 and 8 cases in which mPAP did not decrease immediately after BPA and 12 hours later. However, mPAP in 16 and 8 cases became less than 20mmHg in the chronic phase (mPAP: Post; 28.5±7.3 to 19.6±5.6 mmHg, P<0.001, 12 hours; 26.0±7.8 to 17.8±3.5, P=0.02)

Conclusion: While mPAP after BPA decreased after 6 hours, there were a temporary rise in CO. Improvement can be obtained in the chronic phase after final BPA even if mean PAP did not decrease during the acute phase.