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Editorial

Multidisciplinary Team Approach for the Management of Chronic Thromboembolic Pulmonary Hypertension

Hiromi Matsubara, MD, PhD

Department of Cardiology, National Hospital Organization (NHO) Okayama Medical Center, Okayama, Japan

▸ See the article "Programmed Follow-up and Quality Control of Treatment Techniques Enhance Chronic Thromboembolic Pulmonary Hypertension Management: Lessons From a Multidisciplinary Team" in volume 54 on page 409.

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Correspondence to
Hiromi Matsubara, MD, PhD
Department of Cardiology, National Hospital Organization (NHO) Okayama Medical Center, 1711-1 Tamasu, Kita-ku, Okayama 701-1192, Japan.
Email: matsubara.hiromi@gmail.com

ORCID iDs
Hiromi Matsubara
https://orcid.org/0000-0002-3417-7651

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Over the past decade, management of chronic thromboembolic pulmonary hypertension (CTEPH) has changed dramatically. Advances in diagnostic imaging, such as high-resolution pulmonary artery three-dimensional reconstruction based on multislice computed tomography and perfusion imaging using dual-energy computed tomography, have facilitated the diagnosis and treatment of CTEPH.[1] An important breakthrough in the treatment of CTEPH was the development of treatment options for patients who were not eligible for pulmonary thromboendarterectomy (PEA), which was the only established treatment for CTEPH. Riociguat has been approved worldwide for the treatment of patients who are not eligible for PEA or develop residual pulmonary hypertension (PH) after PEA.[2] Balloon pulmonary angioplasty (BPA), an interventional treatment for CTEPH, has been refined mainly in Japan,[3] spread worldwide, and is now an established treatment option for patients who are ineligible for PEA. Consequently, 3 treatment options are available for CTEPH: PEA, BPA, and medical therapy.[4]

The CTEPH team described in the proceedings of the 5th World Symposium on Pulmonary Hypertension (WSPH) in 2013 should consist of experienced PEA surgeons and CTEPH physicians, whose role is primarily to assess operability.[5] Pre- and postoperative management support should also be the responsibility of the CTEPH team, but intended solely for surgical treatment. With changes in the management of CTEPH, the roles and membership of the teams involved in CTEPH practice have also changed. In the proceedings of the 6th WSPH in 2018, the necessity of a multidisciplinary CTEPH team, consisting of a surgeon experienced in PEA, PH specialist, BPA interventionist, and CTEPH-trained radiologist, was emphasized.[6] The evolution of the CTEPH team into a multidisciplinary team is expected to improve CTEPH management. In the current issue of the *Korean Circulation Journal*, Park et al.[7] have reported a significant improvement in PEA outcomes with the implementation of a multidisciplinary CTEPH team approach as expected. Although part of the success may be attributed to the programmed follow-up after PEA, the main reason for their success was the appropriate selection of candidates for PEA and BPA, as indicated by low in-hospital mortality. Patients deemed ineligible for PEA were successfully treated with BPA and experienced no in-hospital mortality. The authors' experience will provide valuable lessons, especially in developing countries where PEA is not performed frequently and riociguat has not yet been approved.

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The data generated in this study is available from the corresponding author upon reasonable request.

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A side benefit of multidisciplinary CTEPH team development is an increase in the number of patients enrolled in the CTEPH management program. In expert PEA centers that already had a well-developed PEA program, the launch of the BPA program increased the overall number of referred patients by 1.7 times but did not change the number of patients eligible for PEA.[8] Park et al.[7] reported an 11-fold increase in the annual number of all referred patients with CTEPH and 4.3-fold increase in the annual number of patients who underwent PEA. This difference may be attributed to the degree of development of PEA programs in different regions, as well as differences in the recognition of CTEPH. The establishment of a multidisciplinary CTEPH team was presumably a good opportunity to educate other departments within the hospital, referring medical institutions, and patients about CTEPH and its management. Although the initiation of the BPA program reduced the rate of PEA, it was fortunate for both the CTEPH team and patients that the increase in the total number of patients resulted in an increase in the total number of PEAs performed. This is because the efficacy of PEA for patients with CTEPH with central lesions is undeniable, and a certain number of PEAs must be performed to maintain the skill of the PEA surgeon.[6]

Although CTEPH management by multidisciplinary teams has showed rapid and steady development, unresolved issues still remain. First, the optimization of treatment selection has not yet been established and relies largely on the surgeons' decisions. However, it is challenging to standardize the treatment selection process because it depends on the proficiency of the PEA surgeons and BPA operators, which varies from facility to facility, and their timing. It would be acceptable if it is shared, at least within each CTEPH team. Second, the treatment goal for each treatment has not been standardized. It is unacceptable for patients to have different treatment goals for the same disease depending on the treatment modality. Although the impact of residual PH on long-term survival is known for PEA,[9] there are no reports on BPA, and it remains challenging to establish a uniform treatment goal. Structured follow-up after BPA and PEA may be necessary to establish uniform treatment goals. Third, multimodal treatment may be necessary to achieve the treatment goals, as indicated by Park et al.[7]; however, the indications and priorities for each treatment modality have not been established. The accumulation of data from ongoing research may address these issues in the near future. In this regard, multidisciplinary CTEPH teams have played and are expected to continue to play a vital role in improving the management of CTEPH.

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