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Early respiratory changes after transcatheter aortic valve replacement

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Introduction

Transcatheter aortic valve replacement (TAVR) is an alternative treatment for inoperative or high-risk patients requiring surgical aortic valve replacement (SAVR). In previous studies, the vital capacity falls to about 50% immediately after SAVR. Although the vital capacity recovers to about 60-70% in one week, it does not recover to preoperative levels at 3 months following SAVR 1)2). TAVR is expected to preserve respiratory function because TAVR does not require a sternotomy.

Purpose

The purpose of this study was to investigate early stage respiratory function after a TAVR. We assumed that respiratory function is not reduced after a TAVR.

Methods

This prospective study was approved by the local ethics committee of our Institute. Written informed consent was obtained from all patients. The subjects were patients who underwent TAVI at our Institute from July 2017 to March 2019. Exclusion criteria included patients who refused to provide informed consent, emergent cases, NYHA (New York Heart Association) Class IV patients, patients receiving inotropes, patients under mechanical ventilation, patients enrolled in other studies, or patients for whom conducting pulmonary function tests were judged to be difficult. The pulmonary function test was conducted once a day until one week after the TAVR procedure.

Results

The target number was 100, and we ceased registration when informed consent was obtained from 100 patients. TAVR was conducted for 142 cases in this period and 42 cases were excluded. After informed consent was obtained, 17 cases were excluded because they met the exclusion criteria, and the analysis was conducted with 83 cases. The vital capacity and % of vital capacity were significantly reduced from the first day to the sixth day and recovered to preoperative levels at the seventh day after TAVR. The forced expiratory volume was significantly reduced from the first day to the fifth day, and recovered to preoperative levels at the sixth day after TAVR. The percentage of forced expiratory volume at one second was not significantly reduced.

Conclusions

The respiratory function was reduced in the early stages after TAVR. The respiratory function was reduced mostly on the first day after TAVR and recovered to preoperative levels on the seventh day after TAVR. After
TAVR, the respiratory function recovered earlier than after SAVR. We believe that TAVR is more suitable for patients with reduced respiratory function.