

Reintervention after thoracic endovascular aortic repair deserves more attention

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It's our great honor to respond the commentary by Dr. Hsu and Dr. Shih, regarding our recently published study (1). Dr. Hsu *et al.* made some important inference from our study and held an optimistic attitude towards long-term outcomes of thoracic endovascular aortic repair (TEVAR) for aortic dissection compared with open surgery and medical treatment (2).

Dr. Hsu and Dr. Shih suggested the limitation of the study with large heterogeneity. Although subgroup analysis and sensitivity analysis were conducted, the heterogeneity was still high. This situation might be improved by strictly setting the inclusion and exclusion criteria and evaluating the quality of current available studies. However, current high quality study was scarce, because there were a few studies focused on the reintervention of TEVAR. Nevertheless, the present meta-analysis was performed by merging enough data to draw meaningful conclusions and improve the prognosis of the complex clinical problem. And this study provided an overview of reintervention of TEVAR, including the incidence and most common reasons. The most common reasons of reintervention were type I endoleak (35.2%), new dissection (14.4%), and persistent false-lumen perfusion (9.3%).

Dr. Hsu and Dr. Shih also pointed out that morphology data were not taken into consideration when the risk factors of reintervention were identified by regression

analyses. The perioperative morphologic characteristics of aorta would affect the surgeons' decision about the choice of treatment method. However, it should be noted that the absence of original morphology data in most studies made the analysis of the potential effect of morphology on outcomes after TEVAR impossible. From the current available studies, branch vessel involvement, a patent entry tear after TEVAR (3) and native thoracic aortic curvature (4) might be predictors of complications after TEVAR during long-term follow-up period.

TEVAR was introduced as a minimally invasive procedure for aortic dissection compared with open surgery, as reported in several registration studies. Although TEVAR had the advantages of lower perioperative morbidity and mortality for type B aortic dissection, the advantages seemed to depend on a high rate of reintervention. Previous study reported that more than 20% of patients needed reintervention at 1-year after TEVAR (5) and the number reached up to 54% at 6-year (6).

In most situations, the aim of reintervention was to achieve favorable aortic remodeling, prompt false lumen thrombosis and decrease perioperative mortality (7). However, several reports demonstrated relatively high mortality ranging from 11.1% to 66.6% after reintervention (8,9). The mechanism of negative vascular remodeling after reintervention needed to be elucidated in the future study.

In addition, there were some concerns regarding the cost of TEVAR during the long-term follow-up and surveillance, which increased obviously after the second intervention. As recent cost-effectiveness analyses demonstrated, the cost increased eightfold in those with second intervention (31,696 dollars) compared with those without (3,668 dollars) second intervention (10). What's more, about 7.5% of patients underwent more than one reintervention (7).

There was no doubt that a part of patients would be stable with best medical treatment, that was to say, aggressive endovascular intervention might fail to get significant benefit, and conversely lead to late complication requiring reintervention. However, it was difficult that how to differentiate these patients who would be stable without the initial intervention. If the needed reintervention mainly resulted from the procedure-related complications, what we should do was to weigh the advantages and disadvantages of TEVAR. Otherwise, the clinical and technical factors associated with the second intervention should be identified, which would help to decrease the incidence of reintervention.

Reintervention is an important and complex issue, which need more attention and effort to deal with. There is no doubt that vascular surgeons will face more and more patients coming for reintervention in the future. The prevention of reintervention, the selection of indication and the treatment timing will become an indispensable part in the whole process of aortic dissection treatment.

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Footnote

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