INVITED COMMENTARY

Reducing the Mortality from Aortic Rupture: A Japanese Approach

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Yamaguchi and co-authors are to be congratulated on this detailed nationwide analysis of the management of ruptured aortic aneurysms in Japan.[1] According to the Japanese Society for Vascular Surgery (JSVS) data, endovascular repair accounted for only 3% of all treatments for AAA in 2006, rising to 48% in 2012. This is the first population based study comparing the clinical outcomes after endovascular repair (ER) and open repair (OR) of ruptured aortic aneurysms in Japan since the widespread adoption of endovascular techniques.

For suspected ruptured AAA (rAAA), the three year results of the IMPROVE RCT demonstrate a survival advantage resulting from a strategy of CT followed by ER if anatomically suitable. RCTs comparing ER and OR for rAAA (or ruptured thoracic aortic aneurysm, rTAA) have not been performed in Japan. With a population of 127 million spread over more than 400 inhabited islands, there may be particular challenges to establishing networks for the management of ruptured aneurysms in Japan. In this context, Yamaguchi et al. include a propensity score analysis of the outcome of ER and OR for ruptured aortic aneurysms in Japan between 2012−2015. Compared with OR, ER was associated with better in hospital mortality for patients with rTAA (ER 22.5%; OR 29.8%; $p < .001$) and similar mortality for those with rAAA (ER 25.7%; OR 24.3%; $p = .57$). For rAAA, the results were significantly modified by institutional aortic case volume.[1] ER involved shorter hospitalisations for rTAA and rAAA. When considering length of hospital stay or in hospital mortality, it should be noted that in Japan patients tend to reside in hospital for the duration of their rehabilitation, rather than be discharged to another facility. ER resulted in equivalent functional status after a shorter recovery period.

Yamaguchi et al.'s dataset is derived from a retrospective analysis of a hospital payment database and incurs all the benefits and challenges of that approach.[2] Potential biases in the current study include the selection of certified teaching hospitals, possible systematic or non-systematic coding errors in claims databases, as well as residual confounders as propensity score analysis was performed based on variables available in claims data. It was not possible to match for anatomical features such as aneurysm neck length, which we now know are likely to explain many of the previously suggested short-term mortality benefits from endovascular repair in observational datasets of rAAA.[3] Thirty day and medium-term outcomes would have strengthened Yamaguchi et al.'s analysis, but were not available.

The overall mortality from a ruptured aorta may be reduced by optimizing modifiable population, organisational, hospital related, or technical factors. Additionally, screening for AAA in at risk populations effectively reduces mortality in this disease,[4] but Japan does not have a nationalised AAA screening program. In current JSVS guidelines, emergency surgery (including rupture) is "excluded from the indications for EVAR," but also "EVAR may be considered in cases of rupture with stable haemodynamics."[5] The present analysis confirms that endovascular repair for ruptured aneurysms is being performed with acceptable results, and its indications could be broadened in line with the positive results of IMPROVE, and the recommendations in the recently published ESVS guidelines.[4]

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