Editorial

Who is at risk of dissection or rupture in moderately dilated ascending aorta?

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Ascending aortic dissection is a catastrophic medical emergency. Increasing ascending aortic diameter is known to have a profound impact on rupture, dissection and death. Current practice guidelines recommend elective aortic surgery when the ascending aortic diameter reaches 5.5 cm to prevent the fatal complications (1-3). However, the observations from the International Registry of Acute Aortic Dissection (IRAD) have noted that 59% of type A dissection patients had ascending aortic diameter <55 mm at presentation (4). Therefore, it has been suggested that the threshold for elective aortic surgery should be reexamined and predictors other than aortic size should be needed to identify patients at risk of aortic dissection or rupture.

Kim and colleagues recently reported in the *Journal of the American College of Cardiology* the results from a large echocardiography study to examine the risk of dissection in patients with mild to moderately dilated aortas (5). Among a total of 4,654 nonsyndromic adults (age: 68.6±13.1 years) with maximal ascending aortic diameters of 40 to 55 mm, aortic dissection and rupture occurred in 13 and 1 patients, respectively, during follow-up with a median time of 40.1 months (14,431.5 patients-years). Kim *et al*. suggested the risks of aortic dissection or rupture were quite low for ascending aortic diameters <50 mm. As the population studies were lacking to determine the true number of individuals at risk, true risk-benefit ratio of prophylactic aortic surgery which had a significant mortality risk had not been established. Although this study was not truly population-based, the risk of dissection or rupture was generally evaluated among real-world patients with moderate dilatation, who identified by echocardiography performed for any reason. Furthermore, the risks of aortic dissection or rupture were weakly correlated with only age (HR, 1.06; P=0.024) and baseline aortic diameters (HR, 1.20; P=0.006) (5). Although the determination of predictors could be limited considering a quite small event rate, aortic size alone may not be sufficient to predict the risk of dissection or rupture.

Regarding aortic expansion rate, female sex (beta =0.088; P=0.001) and bicuspid aortic valve (beta =0.065; P=0.013) were weakly correlated with aortic expansion rate among 1,414 patients with follow-up echocardiography assessment at an average of 46.9 months, while blood pressures were not (5). Baseline aortic diameter showed mixed associations with aortic expansion, with a positive correlation only in larger aorta (>50 mm) (5). It has been suggested that conventional parameters (age, sex, bicuspid aortic valve) only can explained a minority of change in aortic expansion.

Determination of risks for aortic dissection or rupture in patients with ascending aortic aneurysm, especially moderately dilated, is difficult. Elective aortic surgery should only be performed to prevent the disaster of aortic aneurysm when a significant mortality risk of surgery must be lower than the risk of the natural history of aneurysm. The current study by Kim *et al*. suggested the aortic risk was quite low in moderately dilated ascending aorta and

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the conventional models only accounted for a minority of variability in aortic remodeling. In the future, genetic studies and flow dynamic investigations will be needed to enhance our understanding of the complex pathophysiology of ascending aortic dissection and determine patients at risk.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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