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Commentary: The distance paradox in acute aortic dissection: Speed, super-specialist skills, or both?

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The article by Izumisawa and colleagues¹ adds an important piece to the puzzle in the strategic management of patients requiring thoracic aortic surgery. Delivery of health care is impacted by multiple stakeholders as well as government and local decision making, and understanding these interactions and the effect of particular interventions can be a challenge.

The work in this study is undertaken in the Japanese health care system and has the potential to revolutionize the care structure in Japan, with transportation of patients to centers of excellence in thoracic aortic surgery, rather than being treated at local, lower-volume centers.² The data demonstrate excellent survival rates for thoracic aortic surgery, with a mortality rate of 13.8% at centers of excellence and the observation that transportation of patients considered fit for surgery a median distance of 7.1 km does not negatively impact on survival. High-volume centers had performed more than the minimum requirement of 40 cardiac and/or thoracic aortic surgical procedures on average each year, for the previous 3 years.³ Mortality figures for the less-specialized centers with a shorter transfer distances are not shown.

The authors should be congratulated for the quality and impact of this work, although the following should be remembered when considering the results. First, data on time from symptoms to treatment were not available and

Streamlined care including rapid transfer, diagnosis, and management is the key for AD.

CENTRAL MESSAGE

An algorithm of early diagnosis and swift transfer to specialist care in high-volume centres may be the best-balanced model of care for acute aortic dissection.

transportation distance was used as a proxy, which may be an important limitation when considering the overall short distances to professional care in Japan (50% of patients were transported ≤ 7 km). Second, patients who were transferred from one hospital to another were excluded, which is a relatively frequent referral pathway in the setting of acute aortic syndrome, as were patients air-lifted to travel across sea of ≥ 100 km. Third, the survival of transportation could be seen as an element of selection bias; there are no data presented on patients turned down for transfer.

These factors limit the ease of extrapolation of these results to other countries, which may have significantly longer transfer times. Other countries may also require a larger number of cases to be treated per year to be considered an expert, high-volume center.

Acute aortic syndrome is a highly dynamic condition and time is critical⁴; we should concentrate on saving valuable time for diagnosis and gaining time to allow more patients to be transferred to dedicated centers. Despite the large patient dataset and comprehensive analysis, the current study does not address the problem of how best to manage patients with severe complications who are not fit for transportation yet who are in dire need of specialist help.⁵⁻⁷

Similar to the successful model of care in acute myocardial infarction⁸ (adopted 20 years ago) with networks of regional 24/7 percutaneous coronary intervention centers of substantial volume and streamlined infrastructure, a country the size of Japan would benefit from a network of regional centers for 24/7 acute aortic care, bypassing less-dedicated centers that do not have a streamlined

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infrastructure. Although this model is intriguing, it is complicated by both a low incidence of the problem (compared with myocardial infarction) and difficulty of the onsite diagnosis (requiring imaging).⁴ The future direction of travel would be an undelayed diagnosis on site followed by swift transport 24/7 to a specialist aortic team in a high-volume center. This type of centralization of care has been demonstrated in the United Kingdom to be associated with reduction in 30-day mortality and improved long-term survival.³

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Commentary: Swift and safe

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In this edition of the *Journal*, Izumisawa and colleagues¹ present Japan's nationwide experience with transfer distance and surgical mortality in emergency thoracic aortic surgery. Over a 2-year period, 12,004 patients underwent emergent aortic surgery at 495 centers, with an acceptable mortality of 13.8%. The mean transfer distance was 12.8 km, with one quarter of the study population traveling less than 3 km and one half less than 7 km. The authors did not find a significant association between transfer distance and surgical mortality, suggesting that regionalization of care for patients with acute aortic syndromes (AAS) may be safe.

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CENTRAL MESSAGE

A study showing no difference in emergent aortic surgery outcomes by travel distance is encouraging for care regionalization but limited by survivorship bias and exclusion of inter-hospital transfers.

Without treatment, the reported mortality of acute aortic dissection is 1% to 2% per hour.^{2,3} Accordingly, reduction in presurgical delays is one avenue to improve outcomes.⁴ Not unlike ST-elevation myocardial infarction (STEMI) and acute cerebral vascular accident (CVA), there are data to support timely intervention for AAS. What may differ is a universally accepted time frame for intervention.