- type A aortic dissection in the elderly: clinical characteristics, management, and outcomes in the current era. *J Am Coll Cardiol*. 2002;40:685-92.
19. Januzzi JL, Isselbacher EM, Fattori R, Cooper JV, Smith DE, Fang J, et al; International Registry of Aortic Dissection (IRAD). Characterizing the young patient with aortic dissection: results from the International Registry of Aortic Dissection (IRAD). *J Am Coll Cardiol*. 2004;43:665-9.
 20. Mehta RH, Suzuki T, Hagan PG, Bossone E, Gilon D, Llovet A, et al; International Registry of Acute Aortic Dissection (IRAD) Investigators. Predicting death in patients with acute type a aortic dissection. *Circulation*. 2002;105:200-6.
 21. Gilon D, Mehta RH, Oh JK, Januzzi JL Jr, Bossone E, Cooper JV, et al; International Registry of Acute Aortic Dissection Group. Characteristics and in-hospital outcomes of patients with cardiac tamponade complicating type A acute aortic dissection. *Am J Cardiol*. 2009;103:1029-31.
 22. Svensson LG, Crawford ES, Hess KR, Coselli JS, Safi HJ. Dissection of the aorta and dissecting aortic aneurysms. Improving early and long-term surgical results. *Circulation*. 1990;82(Suppl):IV24-38.
 23. Ehrlich M, Fang WC, Grabenwöger M, Cartes-Zumelzu F, Wolner E, Havel M. Perioperative risk factors for mortality in patients with acute type A aortic dissection. *Circulation*. 1998;98(Suppl):II294-8.
 24. Matsushita A, Tabata M, Fukui T, Sato Y, Matsuyama S, Shimokawa T, et al. Outcomes of contemporary emergency open surgery for type A acute aortic dissection in elderly patients. *J Thorac Cardiovasc Surg*. 2014;147:290-4.
 25. Braverman AC. Acute aortic dissection: clinician update. *Circulation*. 2010;122:184-8.
 26. Krüger T, Conzelmann LO, Bonser RS, Borger MA, Czerny M, Wildhirt S, et al. Acute aortic dissection type A. *Br J Surg*. 2012;99:1331-44.
 27. Bekkers JA, Raap GB, Takkenberg JJ, Bogers AJ. Acute type A aortic dissection: long-term results and reoperations. *Eur J Cardiothorac Surg*. 2013;43:389-96.
 28. Zierer A, Voeller RK, Hill KE, Kouchoukos NT, Damiano RJ Jr, Moon MR. Aortic enlargement and late reoperation after repair of acute type A aortic dissection. *Ann Thorac Surg*. 2007;84:479-86.
 29. Kawahito K, Adachi H, Murata S, Yamaguchi A, Ino T. Coronary malperfusion due to type A aortic dissection: mechanism and surgical management. *Ann Thorac Surg*. 2003;76:1471-6.
 30. Suzuki T, Isselbacher EM, Nienaber CA, Pyeritz RE, Eagle KA, Tsai TT, et al; IRAD Investigators. Type-selective benefits of medications in treatment of acute aortic dissection (from the International Registry of Acute Aortic Dissection [IRAD]). *Am J Cardiol*. 2012;109:122-7.
 31. Melby SJ, Zierer A, Damiano RJ Jr, Moon MR. Importance of blood pressure control after repair of acute type a aortic dissection: 25-year follow-up in 252 patients. *J Clin Hypertens (Greenwich)*. 2013;15:63-8.
 32. Brooke BS, Habashi JP, Judge DP, Patel N, Loeys B, Dietz HC III. Angiotensin II blockade and aortic-root dilation in Marfan's syndrome. *N Engl J Med*. 2008;358:2787-95.
 33. Groenink M, den Hartog AW, Franken R, Radonic T, de Waard V, Timmermans J, et al. Losartan reduces aortic dilatation rate in adults with Marfan syndrome: a randomized controlled trial. *Eur Heart J*. 2013;34:3491-500.
 34. Geirsson A, Bavaria JE, Swarr D, Keane MG, Woo YJ, Szeto WY, et al. Fate of the residual distal and proximal aorta after acute type a dissection repair using a contemporary surgical reconstruction algorithm. *Ann Thorac Surg*. 2007;84:1955-64.
 35. Huynh TT, Starr JE. Diseases of the thoracic aorta in women. *J Vasc Surg*. 2013;57:11S-7S.

Key Words: aorta, aortic dissection, aortic surgery, sex, surgery

EDITORIAL COMMENTARY

Gender differences in patients undergoing surgery for acute type A aortic dissection: Is there really a glass ceiling?

Alan Speir, MD

See related article on pages 581-7.

The impact of gender on outcomes has been incompletely studied across the spectrum of cardiac surgery. Among patients presenting for isolated coronary bypass grafting, women have been shown to have higher mortality according to meta-analysis at short-term, mid-term, and long-term

relative to their male counterparts.¹ The true influence of gender on surgical outcomes in patients with acute type A aortic dissection, however, has remained poorly defined.

In this article published in the current issue of the *Journal*, Fukui and colleagues² have attempted to analyze the influence of gender on the results of operative repair for acute type A aortic dissection.

The primary end point of their evaluation of 504 patients during a 7-year period from a single institution by 4 surgeons who used uniform operative techniques was operative mortality, with secondary end points being late reoperation and late mortality.

From Cardiac, Vascular, Thoracic Surgery Associates, Falls Church, Va.

Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication June 15, 2015; accepted for publication June 17, 2015; available ahead of print July 17, 2015.

Address for reprints: Alan Speir, MD, CVTSA, 2921 Telestar Ct, Falls Church, VA 22042 (E-mail: Aspeir1@gmail.com).

J Thorac Cardiovasc Surg 2015;150:587-8

0022-5223/\$36.00

Copyright © 2015 by The American Association for Thoracic Surgery

<http://dx.doi.org/10.1016/j.jtcvs.2015.06.038>

The mean age of the women in this study was older than that of their male counterparts (71.5 years vs 59.7 years; $P < .0001$), and the women were of significantly smaller body habitus (body surface area 1.5 m² vs 1.9 m²; $P < .0001$). Estimated glomerular filtration rates and intervals from onset of symptoms to operative intervention were approximately the same. The operative mortality was cited as not significantly different between the two groups (4.5% vs 5.8%; $P = .6463$).

Multivariable logistic regression analysis demonstrated that myocardial ischemia, brain ischemia, and shock or tamponade were independent predictors of operative mortality, whereas female gender was not associated with a difference in survival between male and female patients. With regard to late mortality at 5 years, again female gender was not believed to be a predictor. Rather, myocardial ischemia and lack of treatment with β -blockers and angiotensin II–receptor blockers at discharge were independent predictors of death.

The authors of this article have attempted to show the lack of relevance of gender with respect to short-term mortality, 5-year mortality, and rates of reoperation in a single high-volume cardiac center. Analysis on larger subgroups of patients, however, may be needed to support their conclusions. The real answer may require a more robust sampling with meta-analysis to include the effect of gender on outcomes at the different age ranges between the 2 groups surgically treated. Clearly, the women in this study were older, as reflected by their mean age of 71.5 years versus 59.7 years for the men. Moreover, more than 2.5 times the number of women relative to their male counterparts were older than 70 years, with only 63 of the men, or 24.3%, more than 70 years old. Would the outcomes in the men have been as favorable in these older age groups? Specifically, although the numbers of patients were relatively small in the older population of men, was there an impact by gender in those 70- to 75-year-old, 76- to 80-year-old, and older than 80-year-old groups between men and women?

There was a much less aggressive operative philosophy in the complex repairs of the type A dissections in women compared with men, with far fewer arch replacements (19.2% vs 44.8%) and root replacements (9.0% vs 19.7%). One reason presented for such differences was that the women were older and were treated more conservatively. This is presented despite the fact that “age was not an independent predictor of operative mortality in the present study.”² Perhaps there may be differences in philosophy with respect to age in the operative approach among the 4 surgeons?

Is there a bias by the surgeons to be less aggressive when treating the female patients, because of either their older age or their gender? If not, why was there such a discrepancy in the surgical approach, with seemingly more complex

procedures in the male group? Objectively, this smaller number of complex procedures in women undergoing surgical repair of acute type A aortic dissection was reflected by shorter operative and cardiopulmonary bypass times for women. Does this not bring up the question, despite the smaller number of patients available for comparison, of whether the long-term differences between men and women undergoing these more complex procedures (arch replacement or root reconstruction or replacement) might show additional differences of the impact of gender on surgical outcomes?

Surprisingly, at 5 years there was a relevant difference in freedom from reoperation rates between the women and men (92.0% vs 82.9%; $P = .0239$). On the basis of the fact that women had a lower frequency of complex procedures during the initial treatment of the acute type A aortic dissection, one would postulate an increased need for subsequent intervention either on the root of the aorta or on the aortic arch. Moreover, the female group was prescribed β -blockers less frequently at discharge, and β -blockers in this series were credited with protection against late operation (“only nonprescription of β -blockers at discharge was an independent predictor of late operation”). Why, therefore, would the male patients have a higher rate of reintervention during the interval of study, despite the fact that they had more complex procedures at the initial procedure and they were discharged more frequently on β -blockers when compared with the female group?

In summary, the authors contend that in patients surgically treated for acute type A aortic dissection, gender is not a risk factor for early or 5-year operative mortality, nor is it a risk factor for delayed reoperation. In light of the differences in the rates of complex procedures between men and women as well as the lack of stratification by age with the genders treated equally by arch or root replacements, it is not clear that women may have better results than their male counterparts. Nor is it clear whether there exists a “glass ceiling” of mortality at a particular age above which a more conservative approach of supportive care than the more traditional surgical resection should be considered for women. This will require a different study design with a larger sampling of patients compared by age and comparable surgical procedures to understand the impact of gender on treatment and allow any process of care design to be formulated.

References

1. Alam M, Bandle SJ, Kayani WT, Ahmad W, Shahzad SA, Jneid H, et al. Comparison by meta-analysis of mortality after isolated coronary artery bypass grafting in women versus men. *Am J Cardiol*. 2013;112:309-17.
2. Fukui T, Tabata M, Morita S, Takanashi S. Gender differences in patients undergoing surgery for acute type A aortic dissection. *J Thorac Cardiovasc Surg*. 2015; 150:581-7.e1.