7th Annual Women's Heart & Vascular Symposium

Progress in Endovascular Aortic Repair for Women

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The diagnosed prevalence of abdominal aortic aneurysm (AAA) in women is approximately 20% of that in men.[1-3] Therefore, women are underrepresented in epidemiologic studies and trials in which screening and therapeutic methods are evaluated. Consequently, central issues related to AAA in women have not been fully investigated.

First, screening recommendations provide inadequate guidance for women. The United States Preventive Services Task Force has concluded that insufficient evidence exists for screening women with a history of smoking and has advised against screening women who have never smoked.[4] The only prospective studies of ultrasound screening in women yielded no difference in mortality rates at 10 years.[3,5] Subsequent efforts to identify women at high risk of AAA have been more promising.[6,7]

Female sex is associated with a more rapid aneurysmal growth rate and earlier rupture.[8,9] These findings suggest that women might benefit more from earlier AAA repair than do men. In addition, AAAs in women are more likely to have complex features.[10] The median infrarenal aortic neck length in women is 12 mm, compared with 16 mm in men. The degree of neck angulation is greater in women (45° vs 36°), and iliac vessel caliber is smaller (11 vs 14 mm). Thus, approximately 60% of women are not eligible for endovascular aortic repair (EVAR) with use of conventional devices.[11]

Recent advances in device design, including smaller delivery systems and modifications to accommodate shorter neck lengths and greater angulation, can be expected to increase EVAR eligibility in women. For instance, the Endurant® II AAA Stent Graft System (Medtronic, Inc.; Minneapolis, Minn) and the TriVascular Ovation Prime® device (TriVascular, an Endologix company; Santa Rosa, Calif) can accommodate neck lengths as short as 10 mm and 7 mm, respectively. The Zenith® Fenestrated AAA Endovascular Graft (Cook Medical Inc.; Bloomington, Ind), which is uniquely manufactured to conform to patients' aortic anatomy, can be used in necks as short as 4 mm. Extreme neck angulation is accommodated by the Aorfix™ Endovascular Stent Graft (Lombard Medical, Inc.; Irvine, Calif). These devices can also be used in patients who have iliac vessel diameters as narrow as 8 mm and as wide as 25 mm. The TriVascular Ovation® provides the lowest-profile delivery system at 14F.

The ongoing LIFE Study seeks to show benefits associated with the low-profile TriVascular Ovation Prime device in conjunction with the Fast-Track EVAR Protocol, which includes percutaneous access, conscious sedation, and next-day discharge from the hospital.[12] Thirty-day results include low rates of adverse events, high procedural success rates, freedom from endoleak, and hospital readmission rates 5 times lower than those in contemporary EVAR reports (1.6% vs 8.2%).[13] Patients assigned to the fast-track approach showed a trend toward more greatly improved quality of life. Whether the predicted benefits of the Ovation Prime device will specifically translate into improved outcomes in female patients will be determined in the forthcoming LUCY Study.[14]

The underrepresentation of women in clinical trials related to AAA has resulted in a lack of guidance for patients and physicians in the central issues of natural history, screening, and treatment threshold. Technical advances in stent-grafts, which are now lower-profile and more compatible with complex aneurysmal features, are likely to increase eligibility for EVAR in women. In addition to procedural advances, future study should focus on improved screening algorithms and defining the optimal treatment threshold in women.

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