Table. Ruptured abdominal aortic aneurysm (AAA) and candidacy for endovascular aneurysm repair (*EVAR*)[a]

Variable	*No. (%)*	*30-day mortality, %*
Candidates for EVAR		
EVAR	85 (54)	22.4
Open	71 (46)	49.2
Total	156	
P		.0007
Not candidates for EVAR		
EVAR	5 (9)	100
Open	49 (91)	46.9
Total	54	
P		.024

[a]15 patients died before open repair.

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VESS27.

Lessons Learned from a Single Center's Experience Developing a Complex Endovascular Fenestrated/Branched Aortic Program and Obtaining a Physician-Sponsored FDA Investigational Device Exemption (IDE)

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Objectives: In 2008, our division's 5-year strategic plan prioritized three programs. The top priority was, "To become an internationally recognized center of excellence for endovascular treatment of complex aortic pathology extending from aortic valve to external iliac artery."

Methods: We identified four key components to achieve this strategic priority: (1) training at centers of excellence (COE) in complex endovascular repair, (2) industry partnership to improve access to developing technologies, (3) prospective data collection, (4) development and implementation of a physician-sponsored IDE for juxtarenal, pararenal, and thoracoabdominal aneurysms.

Results: After completing training at COEs and developing industry partnerships, our first complex endovascular aortic repair (definition: including 1 or more fenestration/branch) was done in 2010. We have now performed 45 repairs (15 commercially manufactured devices, 30 physician-modified devices) for 3 common iliac, 20 juxtarenal, 8 pararenal, and 14 thoracoabdominal aneurysms. The repairs incorporated 112 fenestrations/16 scallops; 94 (73%) were bridged to a target vessel with a stent graft. All patients had complete 30-day follow-up for calculation of 30-day event rates: 2 (4.4%) mortality, 2 (4.4%) progression to dialysis, 8 (18%) access complications, 2 (4.4%) type I or III endoleaks, and no instances of myocardial infarction, bowel ischemia, paraplegia, paralysis, or stroke. With this experience, we submitted a physician-sponsored IDE to the Food and Drug Administration to evaluate safety/efficacy of physician-modified endografts for complex aortic aneurysms in the fall of 2013 and obtained approval on 30-day review.

Conclusions: In 5 years, we developed a successful complex endovascular aortic program that uses fenestrated and branch repair techniques. Focused strategic planning and a team approach to program development is an effective way for vascular surgery divisions to gain experience and expertise with new complex technologies while ensuring acceptable patient outcomes.

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C1: International Forum

IF1.

Predicting Mortality After Abdominal Aortic Aneurysm Repair: The United Kingdom Aneurysm Risk Model

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Objectives: Current risk-prediction models for abdominal aortic aneurysm (AAA) repair are suboptimal and infrequently used. This study aimed to develop a reliable model for in-hospital mortality after AAA intervention using data from the United Kingdom National Vascular Database (UK NVD), applying rigorous and contemporary statistical techniques to handle missing data.

Methods: UK NVD data for AAA interventions over a 15-month period (Feb 2010-Apr 2011) were analyzed. Multiple imputation methodology was applied to handle missing data, and stepwise minimization of the Schwarz-Bayes criterion was used to select optimal models of in-hospital mortality after AAA repair using (A) preoperative variables only or (B) preoperative and perioperative variables. Two-thirds of the data were used as the "modeling set," with the remaining third used as the "validation set." Model performance was assessed using receiver operating characteristic (ROC) curve analysis, and compared with existing risk-prediction models.

Results: During the study period, 8088 AAA procedures were recorded in the NVD, of which 5872 (72.6%) were elective. Model A (9 variables) and B (10 variables) showed excellent discrimination, with areas under the ROC curve (AUC) of 0.89 and 0.92, respectively, for all AAA procedures. Separate models for endovascular/open or elective/emergency interventions were not necessary, because a single model (with type of repair and mode of admission as input variables) performed better. Discrimination remained excellent when considering only elective procedures (AUC 0.82 and 0.85) and was significantly better than existing models (model A, $P < .001$; model B, $P = .001$).

Conclusions: The United Kingdom Aneurysm Risk Model appears accurate and outperformed all existing tools in this study. After further validation, the model could be invaluable both for preoperative patient counseling and accurate risk adjustment of published outcome data.