Aortic Valve and Ascending Aorta Guidelines for Management and Quality Measures

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1. Introduction and Methodology

The question may be asked why another Guideline manuscript is needed. The reasons are fivefold: (1) to outline pros and cons of treatment options; (2) to outline areas where further research is needed, potentially from updated Society of Thoracic Surgeons (STS) data collection variables as there are few randomized trials that give more absolute answers to questions; (3) to provide technical guidelines for aortic valve and aortic surgery; (4) to provide background for recommended quality measures and suggest quality measures; and (5) to present the new STS valve data collection variables that address issues related to the preoperative testing and technical aspects of aortic valve surgery (Appendix 1).

The evaluation of aortic valve procedures suffers from a dearth of prospective randomized trials that have shown definitive superiority of one procedure over others, although this has been attempted (eg, mechanical versus biological valves, and homografts versus Ross procedure, etc) [2–18]. Indeed, when valve devices are compared for survival (homograft, biological valves, mechanical valves or Ross procedure) and the only adjustment made is for age, there is no difference at all in late survival and thus the debate revolves more around valve durability and anticoagulation [14] (Figs 1 to 3).

Hence, the guidelines rely primarily on nonrandomized trials, observational studies, registries, propensity analyses, and consensus statements of experts. Clearly, these may require revision over time, particularly related to the new transcatheter aortic valve replacement (TAVR) procedures. The application of class of recommendation and level of evidence characterization is according to those recommended by ACCF/AHA (Table 1).

The guidelines address only the adult population and not the pediatric population. When needed, the guidelines draw heavily from the previously published 2010

The Society of Thoracic Surgeons Clinical Practice Guidelines are intended to assist physicians and other health care providers in clinical decision making by describing a range of generally acceptable approaches for the diagnosis, management, or prevention of specific diseases or conditions. These guidelines should not be considered inclusive of all proper methods of care or exclusive of other methods of care reasonably directed at obtaining the same results. Moreover, these guidelines are subject to change over time, without notice. The ultimate judgment regarding the care of a particular patient must be made by the physician in light of the individual circumstances presented by the patient.

For the full text of this and other STS Practice Guidelines, visit http://www.sts.org/resources-publications on the official STS Web site (www.sts.org).

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For authors' disclosure of industry relationships, see Appendix 2.

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Abbreviations and Acronyms

ABP = antegrade brain perfusion
ACE = angiotensin-converting enzyme
AR = aortic regurgitation
AS = aortic stenosis
AVA = aortic valve area
AVR = aortic valve replacement
BAV = balloon aortic valvuloplasty
BSA = body surface area
CABG = coronary artery bypass graft
CAD = coronary artery disease
CT = computed tomography
DLCO = diffusing capacity of lung for carbon monoxide
ECG = electrocardiogram
EF = ejection fraction
EOA = effective orifice area
FDA = Food and Drug Administration
HCA = hypothermic circulatory arrest
IMH = intramural hematoma
INR = international normalized ratio
IVUS = intravascular ultrasound
LV = left ventricular
MRI = magnetic resonance imaging
PFT = pulmonary function test
PPM = patient-prosthetic mismatch
PROM = preoperative risk of mortality
RBP = retrograde brain perfusion
RVOT = right ventricular outflow tract
SVD = structural valve deterioration
TAVR = transcatheter aortic valve replacement
TEE = transesophageal echocardiogram
TTE = transthoracic echocardiogram

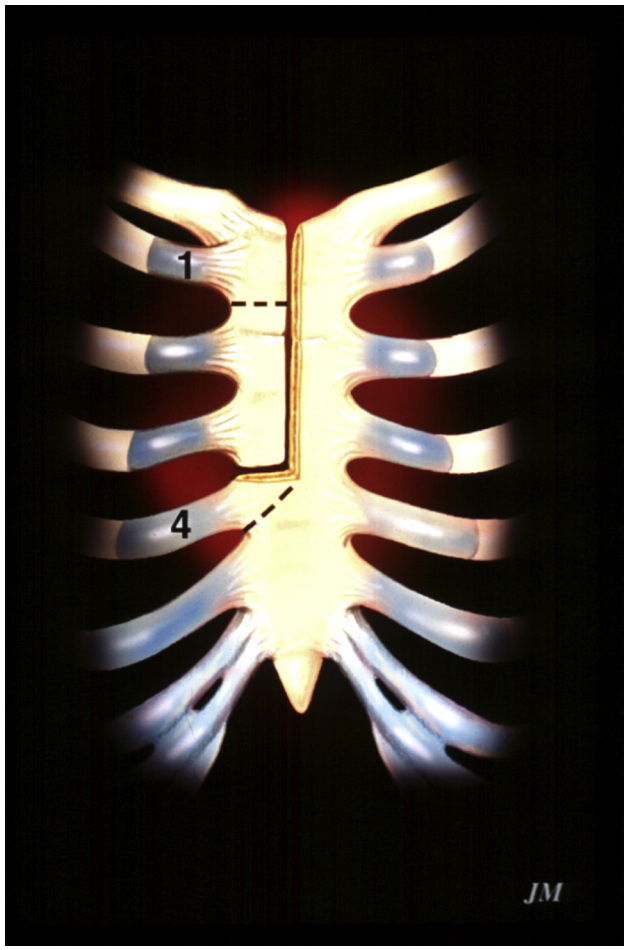

Fig 1. Options for minimally invasive J incision.

ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM guideline for the diagnosis and management of patients with thoracic aortic disease. Hence, indications for surgery are not covered in detail, except where new evidence suggests an update is needed. The previous guidelines for severity of disease and the management of outcomes for patients with asymptomatic disease are summarized and covered in detail in the 2010 document [1, 19, 20]. For cardiologists and cardiac surgeons, there have been few options and no guidelines on how to manage the high risk, previously inoperable, patients. The TAVR technology and particularly the pivotal Placement of Aortic Transcatheter (PARTNER) trials and the ongoing CoreValve trial have further focused efforts on managing this population. Previous studies have suggested that between 38% of patients (Europe) and two thirds of patients (southern California) with severe aortic valve stenosis go untreated [21, 22]. With the advent of TAVR both the traditionally open aortic valve replacement (AVR) procedures and balloon aortic valvuloplasty (BAV) have also pari passu evolved. Hence, these aspects are discussed. The field is rapidly developing, and undoubtedly later guidelines will need to update recommendations based on new iterations.

Literature searches were conducted using standardized MeSH terms from the National Library of Medicine PUBMED database list of search terms. Section authors then drafted their recommendations, using prior published guidelines as a reference when available, and circulated to the entire writing committee as drafts. Revisions were made until consensus was reached on class, level of evidence, references, and language. Finally, the full document was submitted for approval by the STS Workforce on Evidence Based Surgery before publication. The guidelines were posted on the STS website for an open comment period. The guidelines then were also submitted to the STS Council on Quality, Research, and Patient Safety Operating Board and the STS Executive Committee before submission for publication.

1.1. Evaluation of a Valve Procedure

Paramount to evaluating a valve procedure is (1) ease of procedure; (2) safety; (3) efficacy (hemodynamic performance, effective orifice area, and energy loss); (4) durability, measured as freedom from structural valve deterioration; and (5) event-free survival.

For aortic valves this would entail (1) ease of prosthetic aortic valve insertion or valve repair; (2) safety of the