Why we need more septal myectomy surgeons: An emerging recognition

Barry J. Maron, MD,[a] Joseph A. Dearani, MD,[b] Martin S. Maron, MD,[a] Steve R. Ommen, MD,[b] Hassan Rastegar, MD,[a] Rick A. Nishimura, MD,[b] Daniel G. Swistel, MD,[c] Mark V. Sherrid, MD,[c] Anthony Ralph-Edwards, MD,[d] Harry Rakowski, MD,[d] Nicholas G. Smedira, MD,[e] Ethan J. Rowin, MD,[a] Milind Y. Desai, MD,[e] Harry M. Lever, MD,[e] Paolo Spirito, MD,[f] Paolo Ferrazzi, MD,[f] and Hartzell V. Schaff, MD[b]

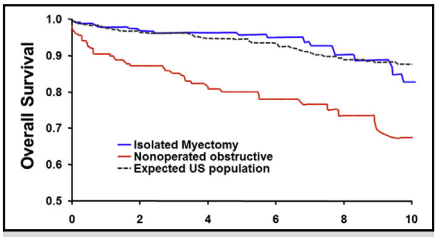
From the [a]HCM Institute, Division of Cardiology, Tufts Medical Center, Boston, Mass; [b]Mayo Clinic, Rochester, Minn; [c]New York University Langone Medical Center, New York, NY; [d]Toronto General Hospital, University Health Network, Toronto, Ontario, Canada; [e]Cleveland Clinic Foundation, Cleveland, Ohio; and [f]Policlinico di Monza, Monza, Italy.

Received for publication Oct 15, 2016; revisions received Nov 21, 2016; accepted for publication Dec 15, 2016.

Address for reprints: Barry J. Maron, MD, HCM Institute, Division of Cardiology, Tufts Medical Center, 800 Washington St, #70, Boston, MA 02111 (E-mail: barrymaron1@gmail.com).

J Thorac Cardiovasc Surg 2017;■:1-5
0022-5223/$36.00

http://dx.doi.org/10.1016/j.jtcvs.2016.12.038



Mortality after myectomy is no different from expected in the US population. From Ommen et al.[1]

Central Message

There are currently an inadequate number of expert cardiac surgeons performing the septal myectomy operation. Therefore, it is important to promote this procedure and bring cardiac surgery to more patients with severely symptomatic obstructive hypertrophic cardiomyopathy.

Hypertrophic cardiomyopathy (HCM) is a diverse genetic heart disease, which while compatible with normal life expectancy, also may be associated with disabling symptoms or adverse events.[2,3] With the decrease in highly visible HCM-related sudden deaths due to the penetration of implantable cardioverter-defibrillators into this population, it is perhaps under-appreciated that currently the most common element of the overall HCM-disease burden is progressive heart failure refractory to maximal medical management (usually judged as New York Heart Association [NYHA] functional classes III/IV).[2,3] This subgroup includes some patients with nonobstructive disease who may become candidates for heart transplantation,[3] but also a larger proportion with drug refractory heart failure due to dynamic left ventricular (LV) outflow tract obstruction.[1-7] These latter patients are candidates for the ventricular septal myectomy operation,[1,4-13] or in selected cases percutaneous alcohol septal ablation.[3,5,6]

THE MYECTOMY EXPERIENCE

An extensive experience over more than 50 years has conclusively shown myectomy to reliably relieve LV outflow gradient and normalize LV pressures, thereby improving NYHA class and quality of life in almost 90% of patients.[1,3,4,10,11] Furthermore, patients who undergo septal myectomy experience enhanced survival similar to that of an age- and sex-matched general population, and also a possible reduction in sudden death risk (Figure 1).[1,4]

Myectomy continues to be the primary and preferred treatment option for severely symptomatic patients with LV outflow obstruction (Figures 1 and 2),[1-6,10,11,13] as evident by expert consensus recommendations such as the 2011 U.S./Canada guidelines (American College of Cardiology/American Heart Association [ACC/AHA]),[5] and also based on substantial clinical experience.[1-6,10-13] Indeed, myectomy has survived more than 50 years as the standard despite the challenges from dual-chamber pacing and percutaneous alcohol ablation over the past 25 years.[5]

The septal myectomy operation involves resection of muscle from the anterior portion of ventricular septum, beginning at the base just below the aortic valve, and extending beyond the point of outflow obstruction (ie, mitral valve-septal contact). Originally designed and promoted by Dr Andrew G. Morrow at the National Institutes of Health (Bethesda, Md) in the early 1960s,[7] the Morrow procedure was quickly adopted by cardiac surgeons at other US and international institutions. With continued experience, however, it became clear that the original Morrow myectomy was limited in width and length, associated with incomplete LV outflow gradient relief in a minority of patients.[8,9,12,13] A more "extended" myectomy was first described by Messmer,[8] and other surgeons who made minor modifications to the procedure,[9,12] with the important principle of creating a sufficiently wide and long muscular resection extending

Abbreviations and Acronyms

ACC/AHA = American College of Cardiology/American Heart Association
HCM = hypertrophic cardiomyopathy
LV = left ventricular
NIS = Nationwide Inpatient Sample
NYHA = New York Heart Association

beyond the endocardial [contact] lesion and the mitral valve coaptation plane, to permit identification of structures relevant to surgical relief of outflow obstruction (eg, mitral valve elongation, anomalous papillary muscle direct insertion into mitral valve, or other anomalous muscle bundles or chordae).[13-16]

The initial euphoria for alcohol ablation, as a percutaneous nonsurgical approach beginning in the late 1990s, refocused attention on outflow obstruction, paradoxically resulting in increased numbers of myectomy referrals. This increase in myectomy volume could also be due to recognition that in a substantial proportion of patients alcohol septal ablation can not be performed successfully given several anatomic issues: Suboptimal septal perforation, massive LV hypertrophy, concomitant coronary artery disease, or mitral valve/papillary muscle abnormalities.

Increase in myectomy surgery has been associated with the growth of dedicated HCM Centers of Excellence[17] in which a dramatic decrease in operative mortality for surgical myectomy has been witnessed.[18] Indeed, current operative mortality in almost 3700 isolated myectomies performed over the most recent 15 years by surgeons experienced with this procedure at 5 major high-volume dedicated North American HCM centers is low, 0.4%, now making it the safest open-heart procedure.[18]

COMMUNITY HOSPITAL MYECTOMIES

Data from the US Nationwide Inpatient Sample (NIS) Database 1998-2011, in 2014[19] and again in 2016,[20] reported a much higher operative mortality for myectomy of up to 6%, when performed in community hospital settings (eg, nonfederal, short-term, general, and specialty hospitals). Although this survey is characterized as representative of US hospitals, it includes only 20% of such institutions. Nevertheless, these NIS data underscore the important surgical principle that higher operative mortality (and comorbidity burden) are associated with lower patient volume, also applicable to other operations that require a high level of specialization and experience like myectomy.[20,21]

We are concerned that these data from NIS significantly overestimate the risk attached to the classic myectomy operation, when performed by surgeons with sufficient

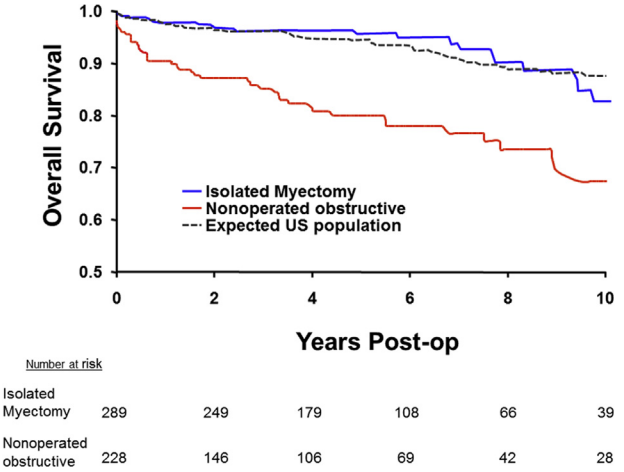


FIGURE 1. Mortality after myectomy is no different from expected in the US population. From Ommen and colleagues.[1]

procedural experience. Reporting such a potentially exaggerated operative risk from NIS can only confuse patients with obstructive HCM and the practicing community, thereby distorting proper management of this disease. Notably, the substantial proportion of patients in the NIS survey having concomitant mitral or aortic valve replacement, coronary artery bypass surgery, and iatrogenic ventricular septal defect raises the legitimate concern that many of these patients either may not have had true HCM and/or the myectomy operation may have been performed by surgeons at centers without clinical experience with HCM.[19-21] Mitral valve replacement

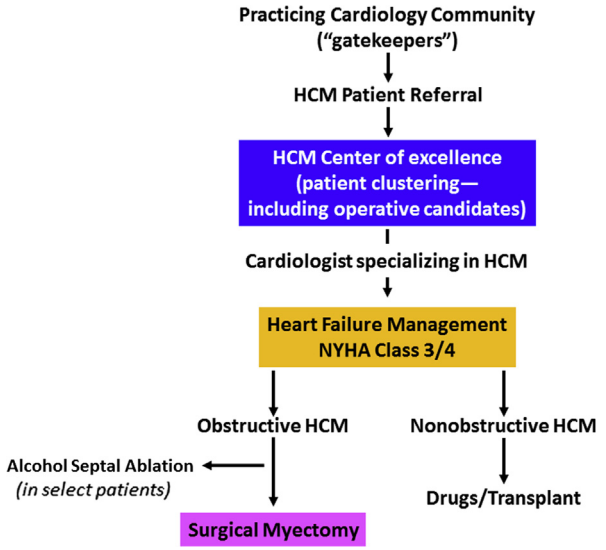


FIGURE 2. Flow diagram of patient referral structure leading to surgical myectomy. *HCM*, Hypertrophic cardiomyopathy; *NYHA*, New York Heart Association.