Alcohol septal ablation for obstructive hypertrophic cardiomyopathy

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Chapter 6.2

editorial
Myectomy Versus Alcohol Septal Ablation : Experience Remains Key*

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In this issue of JACC: Cardiovascular Interventions, Steggerda et al. (1) present a single-center experience comparing alcohol septal ablation (ASA) and septal myectomy for the treatment of symptomatic patients with hypertrophic obstructive cardiomyopathy. They present results of 102 myectomy and 161 ASA patients studied over a mean of 9.1 and 5.1 years, respectively. They note higher periprocedural complication rates with myectomy, driven primarily by a high rate of repeat thoracotomy (most commonly for hemothorax and residual gradient). There were no differences between the procedures in annual mortality (including sudden cardiac death), symptomatic status, or, somewhat surprisingly, permanent pacemaker implantation.

Myectomy is a well-established, effective surgical technique with decades of experience in its use (2). Since its introduction in 1995 (3), use of ASA has increased precipitously given a percutaneous approach, such that there are estimates of >5,000 procedures performed over the course of less than a decade, more than the number of septal myectomies performed in the past half century (4). Olivotto et al. (5) previously outlined the impracticality of a theoretical randomized, controlled trial comparing ASA and myectomy, which would necessitate screening of 34,000 patients for enrollment and randomization of 600 patients in each arm. Therefore, existing published data comparing the 2 techniques is limited to registries and meta-analyses. There remains substantial controversy regarding choice of procedure (4 and 6). Current American College of Cardiology Foundation/American Heart Association guidelines recommend septal myectomy at experienced centers as the first consideration for septal reduction therapy (Class IIa, Level of Evidence: B) and ASA as an alternative in selected patients with contraindication to myectomy or who favor ASA over myectomy following informed discussion (Class IIb, Level of Evidence: B) (6).

The present study highlights the paramount importance of procedural experience. Myectomy was performed at a rate of 3.5 operations/year (102/29 years), whereas ASA was pursued at a rate >16 procedures/year (161/10 years). Put in this context, the post-myectomy perioperative mortality rate of 2%, the high rate of perioperative complications (28%) including permanent pacemaker implantation in 9%, and lengthy post-myectomy hospital stay (mean 9 days) may indeed relate to operative experience as opposed to inherent procedural limitations. Current guidelines stress the need for extensive procedural experience for both myectomy and ASA, defined as >20 procedures per individual operator or a program with >50 procedures, mortality rates <1%, complication rates <3%, and documented success at symptom relief (7).

In contrast to the current series, we performed 232 myectomies at our institution in 2013 alone. We previously reported our operative results, with a myectomy mortality rate <1%, a pacemaker implantation rate of 2.4%, and hospital length of stay a median of 6 days, comparable to the ASA experience reported here (8). Similar results have been reported at the Cleveland Clinic (9) and other high-volume myectomy centers (10). Although the anatomic site of septal myectomy frequently results in postoperative left bundle branch block (11), in the absence of preexisting right bundle branch block, it is difficult to explain the high rate of permanent pacemaker implantation in the present study.

Subjectively assessed symptomatic status post-procedurally was similar between the myectomy and ASA groups, consistent with known meta-analysis data (12), although interestingly objective quantification of cardiopulmonary exercise capacity has shown more improvement with myectomy compared with ASA in previous evaluation (13). Whether this relates to less long-term gradient reduction with ASA (a finding again demonstrated herein) is unknown.

Arrhythmogenic risk post-ablation remains an area of uncertainty. On the basis of MRI (14) and necropsy studies (15), it is clear that ASA is associated with scarring not seen in myectomy. As the authors appropriately cite, there have been reports of higher rates of implantable cardiac defibrillator discharge after ASA (16). In the current evaluation, increased arrhythmogenesis was not seen, a finding echoed in other recent studies (17). However, given the differences in follow-up duration, further longitudinal assessment is warranted.

Where do we go from here? Myectomy has a proven track record of success, yet it is clear that the percutaneous appeal of ASA remains attractive to both physicians and patients. In experienced centers of excellence, ASA may be a reasonable alternative to myectomy in selected patients. A comparison of age- and sex-matched patients undergoing ASA and myectomy at our center revealed no significant difference in survival free of death or need for additional septal reduction therapy; however, there was greater symptom relief in young patients with myectomy and more pacemaker implantation with ASA (18). Assessment of procedural success and risk must be individualized on the basis of both the patient and institutional experience. The present investigation has significant potential for skewing of results on the basis of the discrepant rates of myectomy and ASA. A thorough investigation of adverse procedural outcomes and septal reduction therapy comparative effectiveness remains of immense clinical value, a point emphasized in the guidelines (7). However, it remains clear that procedural success is closely linked to institutional experience, and septal reduction therapies should be limited to referral centers of excellence.

Reference List:

1. R.C. Steggerda, K. Damman, J.C. Balt, M. Liebregts, J.M. ten Berg, M.P. van den Berg. Periprocedural complications and long-term outcome after alcohol septal ablation versus surgical myectomy in hypertrophic obstructive cardiomyopathy: a single-center experience. J Am Coll Cardiol Intv, 7 (2014), pp. 1227–1234
2.A.G. Morrow, E.C. Brockenbrough. Surgical treatment of idiopathic hypertrophic subaortic stenosis: technic and hemodynamic results of subaortic ventriculomyotomy. Ann Surg, 154 (1961), pp. 181–189
3.U. Sigwart. Non-surgical myocardial reduction for hypertrophic obstructive cardiomyopathy. Lancet, 346 (1995), pp. 211–214
4.B.J. Maron. Controversies in cardiovascular medicine. Surgical myectomy remains the primary treatment option for severely symptomatic patients with obstructive hypertrophic cardiomyopathy. Circulation, 116 (2007), pp. 196–206 discussion 206
5.I. Olivotto, S.R. Ommen, M.S. Maron, F. Cecchi, B.J. Maron. Surgical myectomy versus alcohol septal ablation for obstructive hypertrophic cardiomyopathy. Will there ever be a randomized trial? J Am Coll Cardiol, 50 (2007), pp. 831–834
6.M.A. Fifer. Controversies in cardiovascular medicine. Most fully informed patients choose septal ablation over septal myectomy. Circulation, 116 (2007), pp. 207–216 discussion 216.
7.B.J. Gersh, B.J. Maron, R.O. Bonow, et al. 2011 ACCF/AHA guideline for the diagnosis and treatment of hypertrophic cardiomyopathy: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol, 58 (2011), pp. 2703–2738.
8.H.V. Schaff, J.A. Dearani, S.R. Ommen, P. Sorajja, R.A. Nishimura. Expanding the indications for septal myectomy in patients with hypertrophic cardiomyopathy: results of operation in patients with latent obstruction. J Thorac Cardiovasc Surg, 143 (2012), pp. 303–309.
9.N.G. Smedira, B.W. Lytle, H.M. Lever, et al. Current effectiveness and risks of isolated septal myectomy for hypertrophic obstructive cardiomyopathy. Ann Thorac Surg, 85 (2008), pp. 127–133.
10.R.E. Ross, M.V. Sherrid, M.M. Casey, D.G. Swistel, S.K. Balaram. Does surgical relief of obstruction improve prognosis for hypertrophic cardiomyopathy? Prog Cardiovasc Dis, 54 (2012), pp. 529–534.
11.D.R. Talreja, R.A. Nishimura, W.D. Edwards, et al. Alcohol septal ablation versus surgical

septal myectomy: comparison of effects on atrioventricular conduction tissue. J Am Coll Cardiol, 44 (2004), pp. 2329–2332.
12. S. Agarwal, E.M. Tuzcu, M.Y. Desai, et al. Updated meta-analysis of septal alcohol ablation versus myectomy for hypertrophic cardiomyopathy. J Am Coll Cardiol, 55 (2010), pp. 823–834.
13.S. Firoozi, P.M. Elliott, S. Sharma, et al. Septal myotomy-myectomy and transcoronary septal alcohol ablation in hypertrophic obstructive cardiomyopathy. A comparison of clinical, haemodynamic and exercise outcomes. Eur Heart J, 23 (2002), pp. 1617–1624.
14.U.S. Valeti, R.A. Nishimura, D.R. Holmes, et al. Comparison of surgical septal myectomy and alcohol septal ablation with cardiac magnetic resonance imaging in patients with hypertrophic obstructive cardiomyopathy. J Am Coll Cardiol, 49 (2007), pp. 350–357.
15.U. Raute-Kreinsen. Morphology of necrosis and repair after transcoronary ethanol ablation of septal hypertrophy. Pathol Res Pract, 199 (2003), pp. 121–127.
16.F.J. ten Cate, O.I. Soliman, M. Michels, et al.Long-term outcome of alcohol septal ablation in patients with obstructive hypertrophic cardiomyopathy: a word of caution. Circ Heart Fail, 3 (2010), pp. 362–369.
17.R.A. Leonardi, E.P. Kransdorf, D.L. Simel, A. Wang. Meta-analyses of septal reduction therapies for obstructive hypertrophic cardiomyopathy: comparative rates of overall mortality and sudden cardiac death after treatment. Circ Cardiovasc Interv, 3 (2010), pp. 97–104.
18.P. Sorajja, S.R. Ommen, D.R. Holmes Jr., et al. Survival after alcohol septal ablation for obstructive hypertrophic cardiomyopathy. Circulation, 126 (2012), pp. 2374–2380