Letters to the Editor


Acute and long-term results after TASH

The authors[1] are to be congratulated for having set up their programme of catheter treatment for hypertrophic obstructive cardiomyopathy with its extensive peri-interventional assessment in a community teaching hospital setting. Several points, however, seem to need clarification and further comment, especially in view of the fact that the work of our group[2] has been directly referred to.

(1) As the authors and the accompanying editorial[3] state, the intra-cavity pressure gradient is just one facet, although an important one, of the complex disease process in hypertrophic obstructive cardiomyopathy. Diastolic dysfunction and rhythm disturbances may determine symptoms and prognosis in the individual patient to a great extent. Besides a proper ablation technique, patient selection is thus essential. With this in mind, it is hard to understand how the elimination of a moderate pressure gradient of <30 mmHg at rest (in 20 out of 50 patients) or even <50 mmHg after premature ventricular contractions (in three patients) may have contributed to a substantial symptomatic improvement. A subgroup analysis of the patients with only moderate obstruction at baseline would have been helpful in clarifying this issue.

(2) The procedure-related pacemaker implantation rate approaching 40% seems very high. Since the authors themselves have observed the time course of atrioventricular conduction recovery, and since our group has repeatedly reported on a scoring system that allows a risk stratification with respect to the likelihood of pacemaker dependency vs conduction recovery[4–6], the pacemaker implantation rate should have come down to <10%. Not only in terms of haemodynamic efficacy, but also with respect to atrioventricular conduction lesions, surgical myectomy with a pacemaker rate of about 5% should be considered the standard.

(3) The authors state that their decreasing rate of atrioventricular conduction lesions reflects a learning curve, and that this experience was confirmed by our contribution to last year’s ESC meeting in Vienna[2]. This is a clear misunderstanding of our opinion, since in our presentation as well as in all our reports in peer-reviewed journals[6–10] available until submission of the revised article in January 1999 we documented a contrary position. Although learning curve effects can never be ruled out when a technique is modified at a certain time point, our results — both with respect to the pacemaker problem and to targeting and minimizing the ablation lesion — are very much in favour of being a direct consequence of (I) routine echocardiographic guidance[7–9] of septal ablation and (II) the above mentioned risk scoring system[4,5].

This leads to the debate whether the ‘functional’ approach[11], relying on the behaviour of the outflow gradient after balloon-induced ischaemia, may be superior to our ‘anatomical’ approach that relies on intra-procedural echocardiographic visualization of the septal tissue that is going to be ablated[6–10]. As the authors state, a definitive decision can only be made after a randomized comparison. The images provided in their own paper, however, give rise to the suspicion that the outflow gradient with its spontaneous variability of up to 50%[11] may not be that reliable.

Both the transoesophageal echocardiography frame and the left ventricular angiogram show a persisting septal bulge protruding into the outflow tract downstream to the ablation site[1]. Since the tips of the anterior mitral leaflet are not clearly visualized on the transoesophageal echocardiography image, and a colour Doppler frame is not provided, the haemodynamic consequences of this persisting bulge remain unclear in this example. In our experience with more than 250 procedures to date, the persistence of a septal bulge may be associated with a considerable residual gradient, especially if the mitral leaflets are elongated[12]. Our ‘anatomical’ approach therefore aims at creating septal thinning extending from about 5–10 mm upstream to the contact between the septum and the mitral valve with its systolic anterior movement (SAM) down to the aortic root, covering the whole area of gradient formation in analogy to the intra-operative transoesophageal echocardiography-guiding of surgical myectomy. Persisting subaortic bulging is not a typical finding after echo-guided septal ablation that we clearly consider suboptimal.

Another, perhaps still more important topic of the ‘anatomical’, echo-guided approach is avoiding the ablation of other structures than the septal target region[13,14]. Given the fact that we have seen misplacement of the contrast effect in virtually all right and left ventricular structures and segments, especially in papillary muscles[14], a comment on the case with emergency mitral valve replacement would be helpful to rule out the suspicion that unnoticed alcohol necro-tization of a left ventricular papillary muscle was the reason for this event.

(4) Since hypertrophic cardiomyopathy is a global myocardial disease, elimination of the outflow gradient at best changes the obstructive into the non-obstructive variant. Furthermore, because of symptom persistence, although at a lower level, in a substantial number of patients, we disagree with the discontinuation of drug therapy after successful ablation therapy.

In conclusion, we agree with the authors that interventional septal ablation is a promising technique for hypertrophic obstructive cardiomyopathy patients that are candidates for surgical myectomy. We would, however, restrict the procedure to patients with a substantial resting, or at least provoked gradient, strongly recommend intra-procedural echocardiographic visualization of the ablation area in analogy to surgery, and continue medical therapy regardless of gradient elimination.

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References


In patients with hypertrophic cardiomyopathy and substantial outflow obstruction the indication for transcoronary ablation of septal hypertrophy (TASH) depends on the presence of severe symptoms despite medical treatment[1]. We agree that (as Maron points out[2]) the TASH procedure should be strictly confined to those patients who meet the traditional, selection criteria for surgery. Therefore it is quite clear that asymptomatic (or mildly symptomatic) patients, even if they have large basal gradients, are usually not considered candidates for TASH[3]. However, there is an interesting debate whether a marked outflow gradient at rest (≥50 mmHg) is a necessary precondition for interventional therapy in patients with severe disabling symptoms unresponsive to medical therapy[4].

The 50 patients enrolled into our study had a mean resting gradient of 55 ± 43 mmHg and that compares favorably to the mean resting gradient of 48 ± 42 mmHg reported by Schulte et al. in a large surgical survey including 466 patients[5]. We, as did Schulte et al., performed interventions in patients with a resting gradient <30 mmHg. Between the subgroups of patients with a resting gradient <30 mmHg (n=54 up to now, postextrasystolic gradient 111 ± 45 mmHg) and ≥ 30 mmHg (n=95) no significant differences were found with regard to the baseline characteristics and the long-term improvements of septal thickness, NYHA functional class, exercise capacity, maximal oxygen consumption, cardiac index at peak exercise and pulmonary artery mean pressure at workload. Interestingly, similar results were published for surgical myectomy. In 1996 Robbins et al. reported on 31 out of 158 patients (20%) who were operated on with resting gradients <20 mmHg[6], and in 1978 Maron et al. described 28 out of 107 patients (26%) with resting gradients <50 mmHg[7]. In both series they achieved as much symptomatic benefit from septal myotomy/myectomy as did patients with marked basal gradients.

Pacemaker implantation rate

Faber et al. reported on a decrease in pacemaker implantation rate from 17% in their first 30 patients to 7% in the following 61 cases[8]. In our hands, permanent high-grade atioventricular block decreased from 20% in the initial 30 patients to 9% in the following 119 cases.

Because similar reductions in atioventricular conduction disturbances were achieved with (Faber et al[9]) and without the use of intra-procedural myocardial contrast echocardiography (our group), the conclusion — suggested by Faber et al. — that myocardial contrast echocardiography was the most important point for the reduction in permanent high-grade AV block seems to be overstated.

With regard to our data, analysed in 149 patients up to now, the risk of a persistent total atioventricular block is correlated to patient age, operator experience and the degree of gradient reduction intended. A permanent atioventricular block rate of only 2% was observed in a subgroup of 44 patients in whom we accepted a persistent post-extrasystolic gradient of ≥ 50 mmHg. Seven months after TASH in these patients the average decrease in gradient was 74% at rest (66 ± 43 vs 17 ± 21 mmHg, P<0.001) and 62% post-extrasystolic (156 ± 53 vs 60 ± 42 mmHg, P<0.001).

The pacemaker implantation rate is influenced more by the implantation strategy as by the TASH procedure itself. In 1995, on performing the first catheter interventional therapy for hypertrophic obstructive cardiomyopathy in Germany, we decided prospectively to implant dual-chamber pacemakers in all patients with a high degree atioventricular block 48 h after intervention.

This decision, based on the results of rhythmological studies[8,9], was made in order to ensure that patient care was as safe as possible. Interestingly, in 1997 Faber et al. presented a ‘scoring system’, based on a retrospective analysis of 33 patients that confirmed a lack of ‘normal sinus rhythm 48 h after intervention’ as the most significant parameter for a permanent atioventricular block[10]. Furthermore, although late sudden total atioventricular block was observed by Faber’s group (23 months after TASH, data presented at the XXIst Congress of the European Society of Cardiology in Barcelona, August 1999) in appropriate