TABLE 1 Baseline Characteristics and Response to Fibrinolytic Therapy (N = 31)

Age, yrs	28 ± 9.6
Women	16 (51.6)
Time from valve replacement to PVT, months	32 (17.75, 71.75)
Mitral PVT	21 (67.7)
NYHA functional class III/IV	20 (64.5)
Subtherapeutic INR*	20 (69)
Previous valve thrombosis	6 (19.4)
Response to fibrinolytic therapy	
Pre- and post-treatment mitral EDG, mm Hg	14.3, 6.2†
Pre- and post-treatment mitral MDG, mm Hg	25.5, 12‡
Pre- and post-treatment aortic PSG, mm Hg	66.5, 39.5§
Pre- and post-treatment aortic MSG, mm Hg	38.2, 22.6‖
Complete failure	18 (58.1)
Partial response	13 (41.9)

Values are mean ± SD, n (%), or median (IQR). *Two patients did not have baseline INR values. †$p = 0.00039$. ‡$p = 0.000066$. §$p = 0.017$. ‖$p = 0.039$.

EDG = end-diastolic gradient; INR = international normalized ratio; MDG = mean diastolic gradient; MSG = mean systolic gradient; NYHA = New York Heart Association; PSG = peak systolic gradient.

improve by at least 1 New York Heart Association functional class had a major complication compared with one of 19 (5.3%) who did improve ($p = 0.0026$). Reduction in valve gradients with FT did not correlate with improvement in functional class and was not associated with the occurrence of adverse outcomes.

This is the first report to document the occurrence of spontaneous valve opening after failed FT. In a review of 243 patients in 17 retrospective studies with failed FT, Huang et al. (3) found that follow-up information was not available in more than 40% of patients even for assessment of 30-day outcomes. None of the studies followed up patients beyond 30 days. This information is relevant for developing countries because many patients with residual valve dysfunction do not undergo redo surgery.

Though spontaneous restoration of valve function was common, the rate of major adverse events during follow-up was high. However, these events occurred almost exclusively in patients (6 of 7) who were in New York Heart Association functional class III or those who had not improved in functional class with FT. The magnitude of reduction in transvalvular gradients, though predictive of spontaneous valve opening, was not associated with either improvement in functional class or the occurrence of adverse events. Transvalvular gradients are dynamic and are influenced by many variables, including heart rate, and may misrepresent the degree of valve dysfunction. However, these findings are based on a small number of patients and must be interpreted cautiously.

In conclusion, residual valve dysfunction after FT normalizes spontaneously in nearly one-half the patients, but the risk of major adverse events is prohibitively high, particularly among patients who do not show improvement in functional class after FT. Thus, these patients should be triaged for early redo surgery irrespective of the reduction in transvalvular gradients.

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Atrial Fibrillation Ablation in Patients With Hypertrophic Cardiomyopathy

Long-Term Outcomes and Clinical Predictors

Atrial fibrillation (AF) is common in patients with hypertrophic cardiomyopathy (HCM), present in 20% to 25% (1). Radiofrequency (RF) ablation is a safe and effective option for selected patients with symptomatic AF. However, its efficacy in patients with HCM has been less studied. AF in this group may have different mechanisms and thus, catheter ablation may have a different effect. We compared the

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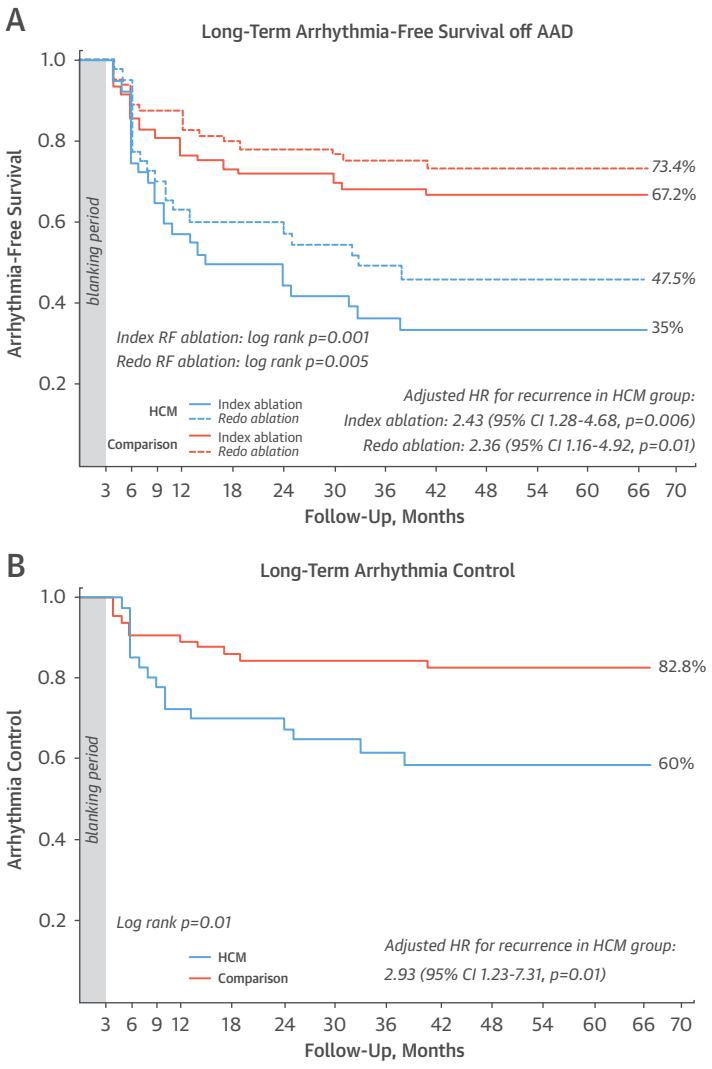
FIGURE 1 Long-Term Arrhythmia Outcomes



Kaplan-Meier survival curve showing the long-term arrhythmia-free survival off antiarrhythmic drugs (AADs) **(A)** and arrhythmia control off or on previously ineffective AADs **(B)**. Note the increase in efficacy in both groups after repeat radiofrequency (RF) ablation, yet the persistent lower efficacy of any strategy in patients with hypertrophic cardiomyopathy (HCM). CI = confidence interval.

long-term clinical efficacy of AF ablation between patients with and those without HCM and aimed to identify predictors of recurrence in patients with HCM.

We analyzed 40 patients with primary HCM (age, 54.3 ± 7.3 years; 70% men) and symptomatic AF (67.5% persistent) undergoing index ablation between 2006 and 2012. Their outcomes were compared with those of 64 patients (age, 56.2 ± 5.8 years; 70% men) with similar AF characteristics (70.3% persistent) without HCM over the same period. The diagnosis of HCM and classification of AF were made according to current guidelines. Patients with long-standing persistent AF were excluded. Our standard approach to AF ablation has been described (2). Acute successful ablation, defined as isolation of all pulmonary veins (PVs) and ablation of sustained organized atrial tachyarrhythmias (OAT), was achieved in all patients. Repeat procedures were performed as clinically indicated in those with recurrence. The median follow-up was 54 months (HCM, 22 to 67 vs. 35 to 67 comparison; p = 0.66). The HCM group had a mean left ventricular (LV) wall thickness of 17.5 ± 2.8 mm. LV outflow obstruction at rest was present in 37.5% of patients with HCM (mean gradient, 37 ± 12.5 mm Hg).

The 1-year arrhythmia-free survival off antiarrhythmic drugs (AADs) was lower in the HCM group (42.5% vs. 70.3%; p = 0.005), and the ablation efficacy declined until the end of follow-up (35% vs. 67.2%; p = 0.001). The recurrent arrhythmia was AF in all (n = 26) with HCM (vs. 95% [n = 20] in non-affected), along with coexisting OAT in 34.5% (n = 9) (vs. 14.5% [n = 3] in non-affected). Twelve patients in the HCM group (30%) underwent a single repeat ablation and 1 patient underwent 2 repeat ablations (mean 1.32 ± 0.5). In the non-affected group, 12 patients (18.8%) underwent a single redo; none had a third procedure (mean, 1.18 ± 0.4; p = 0.7). Most patients had chronic PV reconnection (HCM, 61.5% vs. 91.6% in non-affected cohort; p = 0.0004), whereas the remaining patients had OATs that were mapped and ablated. Repeat procedures resulted in improved arrhythmia freedom; however, the effect on patients with HCM was lower (1 year: 45% vs. 75%; p = 0.001; end of follow-up: 47.5% vs. 73.4%; p = 0.005) (Figure 1A). Similarly, arrhythmia control, defined as maintenance of sinus rhythm with or without AADs, was also lower (60% vs. 82.8%; p = 0.01) (Figure 1B). Patients with HCM were more likely to require chronic AADs (45% vs. 18.8%; p = 0.007), predominantly amiodarone (77.8% vs. 16.6%; p = 0.005).

Patients with HCM who had arrhythmia recurrence were more likely to have LV outflow obstruction (57.7% vs. 0%; p < 0.0001), with only 20.8% maintaining sinus rhythm at the end of follow-up. LV outflow obstruction was an independent predictor of arrhythmia recurrence (hazard ratio: 4.3; 1.6 to 11.4; p = 0.0007). Baseline left atrial pressure ≥12 mm Hg (hazard ratio: 3.1; 1.4 to 7.1; p = 0.005) and dilated left atrium (1.06; 1.003 to 1.11 per mm; p = 0.04) were associated with recurrence only in univariate analysis. Procedure-related complications were rare. However, median hospitalization was longer in the HCM group (2 [1 to 6] vs. 1 [1 to 3] days; p < 0.0001), with a higher readmission rate at 30 days (25% vs.

1.6%; p = 0.0003) as the result of heart failure with congestive symptoms.

Our study is the first comparing long-term arrhythmia control among patients with HCM and a non-affected cohort. We found that the efficacy of AF ablation is significantly lower compared with non-affected patients, irrespective of the number of procedures or use of AADs (3). In fact, these are frequently required. Potential explanations include anatomic variations in atrial thickness in patients with HCM as well as different AF substrate and non-PV triggers. In this study, re-isolation of all chronically reconnected PVs did not improve arrhythmia control in patients with HCM to the same extent as that in non-affected subjects. Our results indicate that AF ablation is safe in the HCM population, although it can be associated with significant post-procedural volume retention and pulmonary edema requiring treatment. When present, LV outflow obstruction is a strong predictor of recurrence.

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Platelets Interplay Between Pneumonia and Cardiovascular Events

Establishing a Link?

We read with interest the study by Cangemi et al. (1) entitled "Platelet Activation Is Associated With Myocardial Infarction in Patients With Pneumonia." The authors aimed to shed light on the role of platelet activation in hospitalized patients with community-acquired pneumonia (CAP) and myocardial infarction (MI). Although the findings of the present study were also discussed in a well-written editorial by Santos-Gallego and Badimon (2), we believe that several issues need to be highlighted and further clarified in this field.

First, both Cangemi et al. (1) and Santos-Gallego and Badimon (2) support the pathophysiological link between pneumonia and acute cardiovascular events with data from the long-lasting infection hypothesis that implicated microorganisms in atherosclerosis. It should be noted, however, that no clear proof of this hypothesis exists, especially after the failure of antibiotic trials (3). Of note, influenza viruses that are mentioned as an example of this link in both papers account for only 11% of CAP in hospitalized patients (4).

Furthermore, hospitalized patients with CAP are characterized by an increased rate of comorbidities compared with patients not requiring hospitalization. Comorbidities, such as cardiovascular and cerebrovascular disease, diabetes, hypertension, renal failure, chronic obstructive pulmonary disease, and peripheral arterial disease, that were present in the study's population are well-known entities with increased platelet reactivity and already established atherosclerotic alterations (5). Therefore, enhanced platelet reactivity was probably evident before the CAP diagnosis in these patients. This hypothesis is supported by the finding that higher soluble P-selectin levels were also detected in patients with isolated increased troponin, but without MI, that were characterized by a higher prevalence of comorbidities. This result could be explained by the fact that P-selectin, apart from being a marker of increased platelet activation through platelet adhesion to monocytes, also initiates a series of functional responses implicated in the pathogenesis of atherosclerosis, such as transfer of tissue factor to monocytes, fibrin deposition to growing thrombus, and superoxide anion and cytokines production by leukocyte. In that way, P-selectin mediates importantly the inflammatory process of atherosclerosis and high serum levels of this molecule indicate also an enhanced atherosclerotic burden that these patients most likely exhibit as a result of their comorbidities. The same applies for CD40L, which induces the production of chemokines and expression of adhesion molecules by endothelial cells, thereby initiating an inflammatory response at sites of vascular injury. Thus, the lack of data on platelet