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## Original Article

# Alcohol septal ablation for hypertrophic obstructive cardiomyopathy – 8 years follow up



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## ABSTRACT

**Background:** Alcohol septal ablation is emerging as an alternative to surgical myectomy in the management of symptomatic cases of Hypertrophic obstructive cardiomyopathy (HOCM). This involves injection of absolute alcohol into 1st septal perforator thereby producing myocardial necrosis with resultant septal remodelling within 3–6 months. This results in reduction of septal thickness and LV outflow gradients with improvement in symptoms.

**Methods:** Fifty three patients had undergone alcohol septal ablation, there were 2 early and 2 late deaths and 4 patients lost to follow up. Forty-five (85%) of them were followed up to a mean period of  $96 \pm 9.2$  months. Clinical, ECG, and Echocardiographic parameters were evaluated during follow up.

**Results:** Only 4 out of 51 patients remained in NYHA class III or IV at the end of 6 months. Significant reduction of LV outflow gradients ( $79 \pm 35$  to  $34 \pm 23$  mmHg) and septal thickness ( $23 \pm 4.7$  mm to  $19 \pm 3$  mm) were observed during 6 months follow up. Beyond 6 months there was no further decrease in either septal thickness or LVOT gradients noted. Ten percent of patients needed pacemaker implantation. There was 92% survival at the end of 8 years.

**Conclusion:** Alcohol septal ablation is a safe and effective nonsurgical procedure for the treatment of HOCM. By minimizing the amount of alcohol to  $\leq 2$  ml, one can reduce complications and mortality. The long-term survival is gratifying.

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## 1. Introduction

In the management of symptomatic patients of hypertrophic obstructive cardiomyopathy (HOCM) dual chamber pacemaker implantation or surgical myectomy were the

therapeutic options in the past. In 1995 Ulrich Sigwart<sup>1</sup> introduced transcoronary alcohol ablation of septal hypertrophy (TASH) and in the same year Kuhn et al<sup>2</sup> from Germany also reported TASH procedure for the management of HOCM. From India cases of successful TASH were reported by Bahl et al<sup>3</sup> and also Bhargava et al.<sup>4</sup> TASH procedure involves

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**Table 1 – Symptoms (n = 53).**

FOD8 Dyspnea: 40 (75.5%)
FOD8 Angina: 25 (47.2%)
FOD8 Palpitations: 14 (26.4%)
FOD8 Syncope: 11 (20.7%)
FOD8 Pulmonary edema: 5 (9.4%)

injection of absolute alcohol into the first septal artery supplying the basal part of the interventricular septum, resulting in chemical necrosis there by producing controlled septal infarction. This results in gradual septal remodelling due to thinning of the septum thereby reducing the LV outflow gradient resulting in relief of symptoms.

We are reporting single center retrospective analysis in TASH procedure, the largest series from India, in meticulously selected cases of HOCM with 8 years follow up.

## 2. Materials and methods

From Jan 1997 to Dec 2011 fifty-three patients underwent TASH procedure for symptomatic HOCM at our center. Their ages ranged from 20 to 68 yrs with a mean age of  $48 \pm 7.2$  yrs. There were 43 men and 10 females. The diagnosis was based on clinical findings and echocardiographic evidence of disproportionate hypertrophy of the interventricular septum compared to posterior LV wall associated with LV outflow tract (LVOT) gradient.

### 2.1. Symptoms

Details are as shown in Table 1. Majority were in NYHA class III (77.4%) or class IV (9.5%) symptoms. One patient had undergone TASH procedure as an emergency on ventilatory support. Prior dual chamber pacemaker was implanted in one case and one case had undergone surgical myectomy 6 years prior to TASH without much improvement in symptoms or LVOT gradient.

### 2.2. Medications

Thirty seven (69.8%) were on betablockers, 11 (20.7%) were receiving calcium channel blockers, amiodarone in 8 (15%) and only 2 (3.7%) patients were on disopyramide.

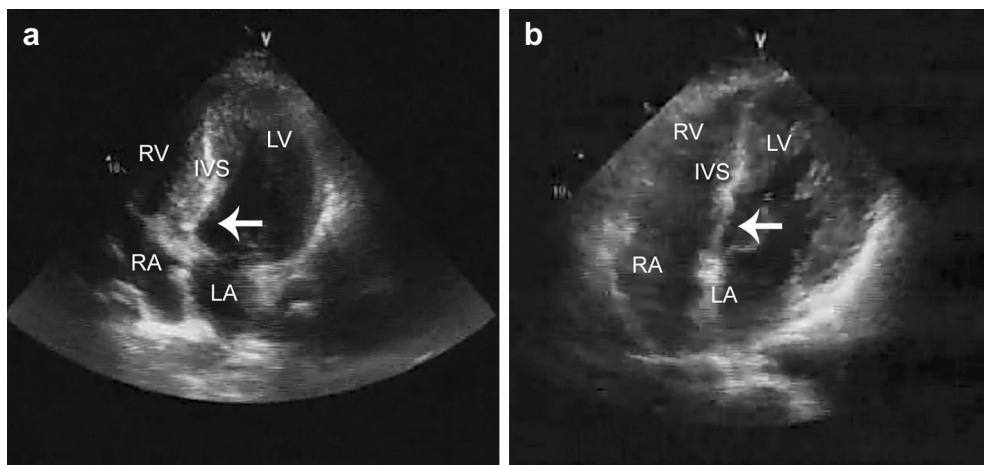
### 2.3. Procedure

TASH procedure was performed as per the procedural details published by us earlier.<sup>5</sup> The inclusion and exclusion criteria followed at our center were described in our earlier publication.<sup>5</sup> Drugs like betablockers were stopped 24 h before the procedure. Temporary pacing wire was inserted routinely and kept for 48 h. Weight adjusted heparin was given to all of them.

Left coronary artery was cannulated using 6F/7F guiding catheter. High torque floppy guide wire was used to enter the target septal branch (TSB). Over the wire balloon 1.5–2 mm and lengths 10–12 mm was positioned in TSB and inflated to 4–6 atms. 0.5–1 ml of nonionic contrast was injected through the central lumen to verify the balloon position in the desired septal branch and also to ensure that no contrast leakage into the left anterior descending artery. Temporary occlusion of TSA should result in significant fall in resting or provokable gradient and portends good response to TASH.<sup>6</sup> After identifying the culprit septal branch 2 ml of absolute alcohol was injected into the TSB, 1 ml as bolus followed by 0.2 ml every 2 min as described by Kuhn et al.<sup>2</sup> Intravenous analgesia was administered routinely before injecting alcohol. In 46 cases 2 ml or less was injected and in 7 cases more than 2 ml alcohol was injected. Mean amount of alcohol injected was  $1.92 \pm 1.8$  ml. The culprit septal branch was first septal in 47 cases and second septal in 6 cases.

### 2.4. Echocardiographic guidance

Echo guidance is an integral part of TASH procedure. Echocardiographic Levovist contrast was used by earlier workers.<sup>7–10</sup> We routinely used diluted nonionic contrast to identify TSB and also to ensure that unwanted areas like papillary muscles or ventricular free walls were not opacified. Basal septal brightening after contrast injection is confirmatory.



**Fig. 1 – a: Interventricular septal hypertrophy before TASH. b: Interventricular septum thinned out 6 months post-TASH in same patient.**

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