

Using Cafeteria as a Stress Lab : Provoking LVOT gradient in HCM

In the era of Mavacamten, a cut off value of 50 mm Hg– resting or provoked– LVOT gradient in hypertrophic cardiomyopathy (HCM) has become important. A gradient above 50 mm Hg becomes an indication to start Mavacamten. In HCM it is quite common to have resting LVOT gradients under 50 mm Hg and certain manoeuvres are described to provoke the gradients in such cases. Valsalva manoeuvre and sublingual administration of nitroglycerin are two of these commonly performed bedside methods.

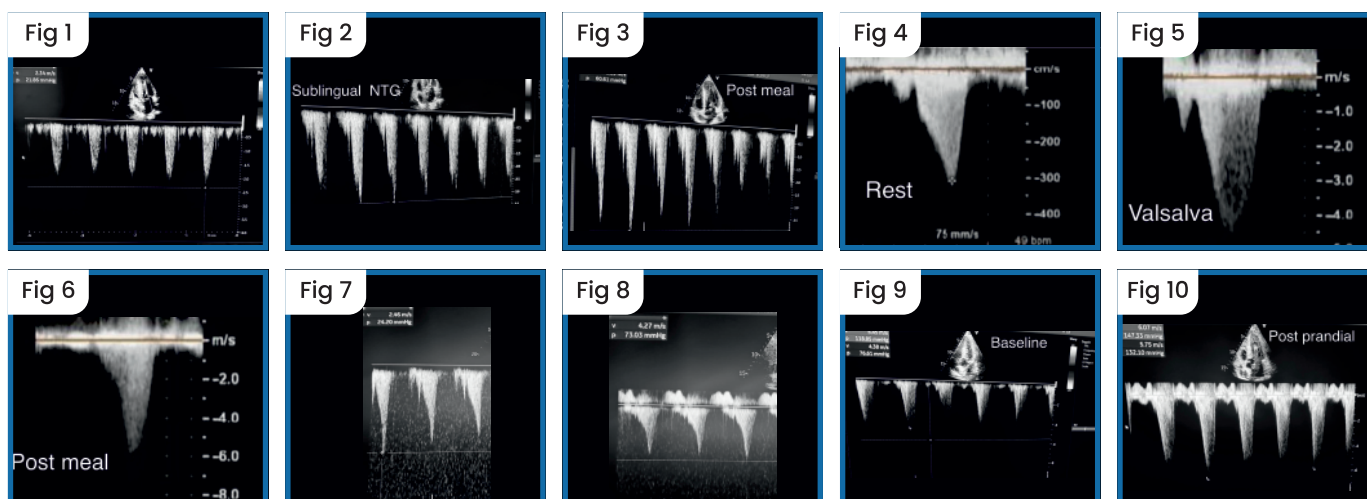
We present 4 cases of HOCM in which provocation of gradient by a full meal could add significant incremental value in assessment of peak gradient across the LVOT in these patients.

Case 1: A 55 y male with HOCM was found to have a resting LVOT gradient of 21 mm Hg (Fig 1). Sublingual nitroglycerin could increase the gradient to 35 mm Hg (Fig 2). He was asked to have a full meal and return for echo exam. The LVOT gradient increased to 60 mm Hg (Fig 3) which qualified him for treatment with Mavacamten.

Case 2: A 30 y male with HOCM was found to have a resting LVOT gradient of 36 mm Hg (Fig 4). Valsalva manoeuvre increased it to 68 mm Hg (Fig 5). He was asked to return for echo after a full meal which revealed the peak LVOT gradient to be 144 mm Hg (Fig 6).

Case 3: A 41 y male with HOCM had peak LVOT gradient of 24 mm Hg (Fig 7). We directly asked him to come for echo after a full meal. It revealed a peak gradient of 73 mm Hg (Fig 8) thereby qualifying him for Mavacamten therapy.

Case 4: A 50 y male with HOCM was found to have a post meal LVOT gradient of 132 (Fig 10) mm Hg after a baseline study revealed it to be 76 mm Hg (Fig 9).



Downsides of Valsalva Manoeuvre

A) Variable effort / poor reproducibility

The result depends heavily on how well the patient performs it—duration, force, and timing matter. Elderly, dyspneic, or poorly cooperative patients often don't generate an adequate strain, so gradients can be underestimated.

B) Not physiologic

Valsalva creates an artificial preload reduction. A patient may have a dramatic Valsalva gradient but less relevant exercise-induced symptoms, or the reverse. So it doesn't always reflect what happens during daily exertion.

- C) May miss exercise-induced obstruction
- D) Difficult Doppler acquisition during maneuver
- E) Less useful in atrial fibrillation or inability to follow instructions

Downsides of sublingual nitrates

- A) Can provoke significant hypotension: *It can cause pre syncope and syncope in elderly
- B) Can exaggerate obstruction beyond daily physiology
- C) Longer and less controllable than Valsalva: Once given, the effect persists for several minutes. If the patient becomes symptomatic or hypotensive, you can't "turn it off" like stopping a Valsalva maneuver.
- D) May induce reflex tachycardia

Full meal as provocative test

We noticed that immediate post-meal (performed within 30 min) status results in some of the highest LVOT gradients recorded in a given patient. Given the consistent results, we believe that no patient should be denied Mavacamten therapy without a post-meal challenge. It has the following advantages.

1. No technical cooperation from the patient is required (like Valsalva)
2. No side effects (Like sublingual nitroglycerin)
3. No contraindications
4. It is physiological
5. Good reproducibility
6. It consistently produces maximum gradients in majority of patients with HOCM

Why a meal can provoke gradient After a large meal:

- * Splanchnic vasodilation → blood pools in mesenteric circulation → relative ↓ preload
- * Some degree of ↓ systemic vascular resistance (afterload)
- * Mild increase in sympathetic tone/heart rate in some patients

Why it's not routinely used as a formal test

- * Poor standardization: What is a "full meal"? Fat/carbohydrate load, volume, and timing all matter.
- * Timing variability: Peak effect may differ (often 30–90 min after eating).
- * Impractical in echo lab workflow
- * Less reproducible (However we have found to be quite reproducible)



**ALL OTHER
SUPER
SPECIALITY
SERVICES
UNDER
ONE ROOF**

CARDIOLOGISTS: Dr. Ajit Bhagwat | Dr. Sachin Mukhedkar
Dr. Ranjit Palkar | Dr. Mahendrasingh Parihar | Dr. Shashank Telang

Gut No. 43, Bajaj Marg, Satara Parisar, Beed Bypass Road, Chhatrapati Sambhajinagar. Tel.: +91 240-6632111