Phrenic Nerve Block as a Bridge to Permanent Treatment for Intractable Hiccups after Coronary Artery Bypass Grafting

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Introduction

- Hiccups are involuntary diaphragmatic spasms with glottic closure—usually self-limiting, but intractable cases warrant treatment
- Phrenic nerve injury is a recognized cause of hiccups; the left phrenic nerve is especially vulnerable in cardiac surgery, including coronary artery bypass grafting (CABG)[1]
- Treatment options range from maneuvers and medications[2] to nerve block[3], radiofrequency ablation[4], and thoracoscopic clipping[5]

Case Description

Patient: 49-year-old man with constant intractable hiccups (several per minute) for 14 months following CABG

Prior workup/treatment:

- **Misdiagnosed:**

Nissen fundoplication for a paraesophageal hernia (initially suspected cause) 1 month before presentation—relieved GI symptoms but hiccups persisted

- **Medications failed:**

Medical management included failed trials of chlorpromazine, gabapentin, and baclofen

Preoperative PFTs: FEV1 98% predicted. **DLCO could not be measured** — the patient was unable to hold his breath due to the hiccups.

Procedure

- Ultrasound-guided left phrenic nerve block
- **6 mL bupivacaine 0.5%** injected in divided doses via a 22G 80 mm Sonoplex Stim Pajunk needle → **complete resolution of hiccups for ~8 hours.**

Definitive Management:

- Referred to thoracic surgery after complete-but-temporary response

Outcome

- Thoracoscopic placement of a permanent clip on the left phrenic nerve → **immediate, complete resolution** sustained >1 month at follow-up
- Postoperative CXR showed an elevated left hemidiaphragm consistent with successful phrenic nerve interruption, without clinical sequelae.

Discussion

- **Diagnostic value:** Complete resolution after the block localized the symptom source to the left phrenic nerve, confirming a phrenic-mediated etiology after other causes (paraesophageal hernia) and multiple pharmacologic agents had failed.
- **Therapeutic and prognostic value:** The temporary but total response provided the evidence needed to proceed to permanent clipping and helped identify the patient as likely to benefit from definitive surgery.
- **Minimally invasive, low-risk first step:** Ultrasound guidance allows rapid, targeted symptomatic relief and functions as a bridge to definitive management.
- **Clinical context:** Left phrenic susceptibility during cardiac surgery supports phrenic irritation/injury as the mechanism in post-CABG intractable hiccups refractory to conventional therapy.

Conclusion

Ultrasound-guided phrenic nerve block is an effective diagnostic and therapeutic option for post-CABG intractable hiccups refractory to pharmacologic therapy and can serve as a **bridge to definitive management.**

In this case, **block-induced relief localized the source** and justified **permanent thoracoscopic phrenic nerve clipping**, which produced durable resolution.

Minimally invasive intervention is a valuable first step in the systematic treatment of post-CABG hiccups. It can offer rapid symptomatic relief **while selecting patients most likely to benefit from permanent surgical management**

References

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