INTERCOSTAL CRYONEUROLYSIS: A FAILURE TO FREEZE

Sam Moshofsky, MD, Jenny Chen, MD, PhD

Introduction:

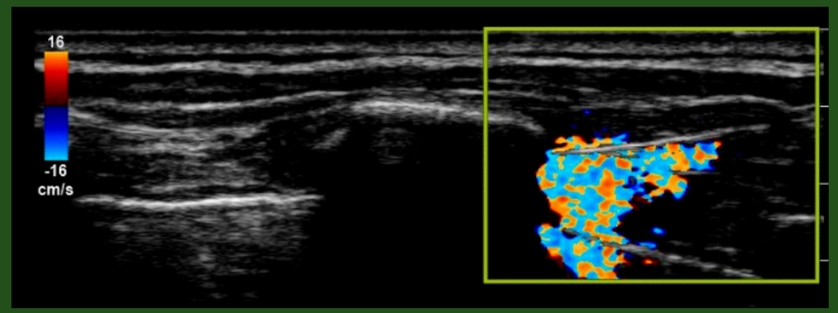
- Ultrasound-guided intercostal cryoneurolysis provides safe, effective targeted analgesia for intercostal neuralgia (1).
- Real-time sonographic markers, such as color Doppler twinkling artifact and ice ball formation (a hyperechoic superior border with acoustic shadowing) (2), serve as critical procedural components to confirm successful targeted freezing

Case Report:

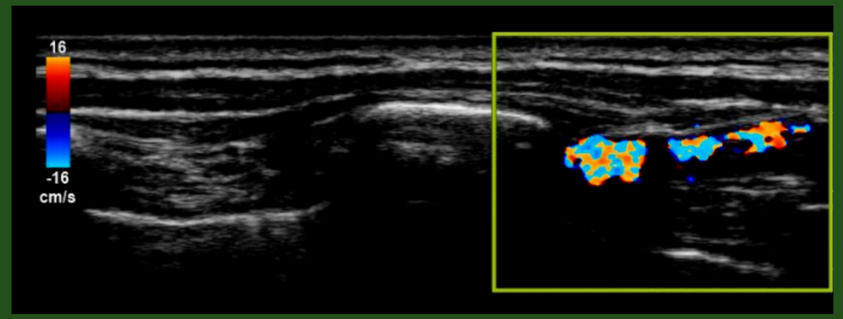
- An 81-year-old woman was diagnosed with intercostal neuralgia after T7 and T8 vertebral body compression fracture
- She underwent successful intercostal nerve blocks at the left T7, T8, and T9 levels, and proceeded with intercostal cryoneurolysis.
- T8 and T9 cryoneurolysis were performed with evidence of appropriate ice ball formation with a hyperechoic line and acoustic shadowing.
- **However, at the T7 level, there was excessive color doppler twinkling artifact, and an absence of a hyperechoic line to suggest ice ball formation.**
- It was discovered the CO2 gas tank was nearly depleted, and thus not providing adequate cryogenic temperatures. Following tank replacement, repeat ultrasound during the freeze cycle confirmed successful ice ball formation with complete hyperechoic border and posterior shadowing.

Continuous ultrasound monitoring of ice ball formation is critical to assess technical success during intercostal cryoneurolysis

Excessive twinkling artifact, no ice-ball



Appropriate Ice-ball Formation



Materials and Methods:

- Informed consent was obtained from the patient for the publication of this case report and any accompanying images.

Discussion:

- This case highlights the clinical importance of continuous ultrasound monitoring during intercostal cryoneurolysis.
- Beyond confirming anatomical localization and avoiding pleural injury, active sonographic verification—specifically tracking ice ball formation and posterior acoustic shadowing alongside twinkling artifact—is essential.
- Real-time visualization ensures technical efficacy, flags equipment failure immediately, and optimizes delivery of the intended outcome.

References:

Huang J, Delijani K, El Khudari H, Gunn AJ. Intercostal Cryoneurolysis. Semin Intervent Radiol. 2022 Jun 30;39(2):167-171. doi: 10.1055/s-0042-1745763. PMID: 35781990; PMCID: PMC9246488.

Nicolás M, Acosta CM, Martinez Ferro M, Alesandrini A, Sullon S, Speroni FA, Tusman G. Short communication: ultrasound-guided percutaneous cryoanalgesia of intercostal nerves for uniportal video-assisted thoracic surgery. Ultrasound J. 2022 Jul 30;14(1):33. doi: 10.1186/s13089-022-00284-4. PMID: 35907076; PMCID: PMC9339062.

OHSU

