Percutaneous Image-Guided Cryoablation of Recurrent Myxofibrosarcoma in the Forearm

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SYMPOSIUM ON CLINICAL INTERVENTIONAL ONCOLOGY

Introduction

- Myxofibrosarcoma (MFS) is a soft tissue sarcoma that commonly presents in the extremities of adults (1). MFS tends to be superficially located, however, can exhibit infiltrative growth leading to greater recurrence.
- Conventional treatment of MFS is surgical excision along with the use of radiotherapy (2). However, the wide surgical margins and anatomical presentation of the tumor, can pose great challenges. Cryoablation is a minimally invasive technique that uses cryoprobes to deliver compressed gas (argon) to cool tumor tissue for purposes of necrosis to less than -20 degree Celsius (3).
- In this case report, we highlight the use of percutaneous image-guided cryoablation in a patient with myxofibrosarcoma of the forearm.

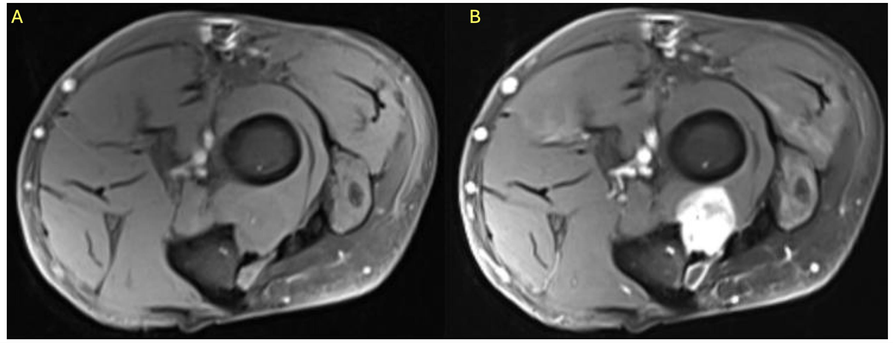
Case Presentation

- 81-year-old with recurrent MFS in left forearm
- History:
  - Initial surgery + radiation (2013)
  - Recurrence and surgery with infection (2017)
- In 2020, recurrence confirmed on biopsy
- Patient preference to avoid an additional surgery

Imaging Findings

- MRI: Heterogeneous T2 hyperintense enhancing mass in supinator muscle
- Size: 2.6 cm in craniocaudal dimension and 1.3 x 1.1 cm in axial dimension

Figure 1. Pre-procedure MRI
(A) Axial T1 fat-saturated pre-contrast MRI image showing a soft tissue mass within the supinator muscle belly.
(B) Corresponding post-contrast image demonstrates enhancement of the mass.



Procedural Details

- Intra-operative guidance: Real-time ultrasound + CT
- 2 cryoablation probes (Varian; PCS-17RS: round, 7 cm short shaft) along tumor axis
- Protocol:
  - 2 cycles of freeze (8 min) / passive thaw (10 min) / freeze (8 min)
  - Active thawing at end
  - CT at 2-minute intervals to monitor ice ball coverage and avoidance of critical structures

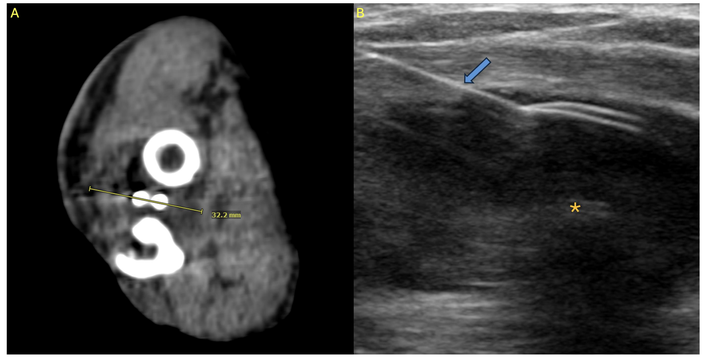
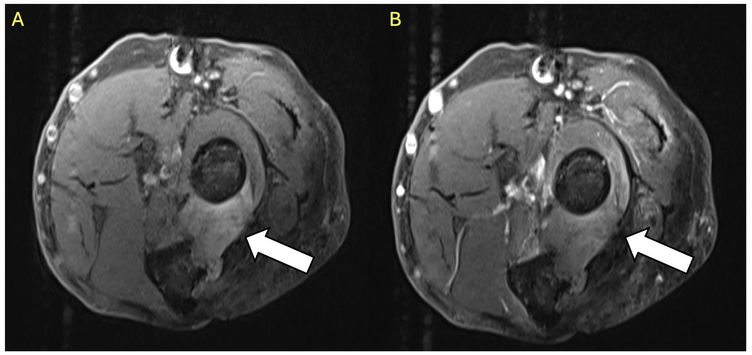


Figure 2. Intraprocedural images (A) Axial CT image at 8 minutes demonstrating ice ball formation surrounding the cryoablation probes (B) Ultrasound image showing longitudinal view of the cryoprobe (arrow) entering the hypoechoic mass (*)

Post-Procedure Outcomes

Figure 3. Post-op MRI



Conclusion

- Cryoablation achieves 86% progression-free survival at 1 year and 80% at 2 years for recurrent or metastatic soft tissue sarcomas (4)
- Ultrasound and CT allow for real-time monitoring of probe placement and ice ball formation during cryoablation.
- Mitigating adverse risks of cryoablation:
  - Warm saline gloves to prevent skin necrosis
  - Intraprocedural EEG and EMG to assess for any nerve injury
  - Maintaining safe distance from neurovascular structures

References

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