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A Unique Case of Ultrasound-Guided Brachial Plexus Hydrodissection for Neuropathic Pain in Radiation-Induced Brachial Plexopathy

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INTRODUCTION

Radiation-induced brachial plexopathy (RIBP) is a delayed complication of radiotherapy associated with fibrosis, microvascular injury, and neural damage.

Patients may develop neuropathic pain, sensory loss, weakness, and progressive upper-extremity dysfunction, often years after treatment.

Management is largely supportive, relying on rehabilitation and neuropathic pain medications, which may provide incomplete relief or be limited by adverse effects.

Ultrasound-guided **brachial plexus hydrodissection** has been used for other neuropathic conditions, but its role in RIBP remains poorly defined.

CASE DESCRIPTION

Patient — 76-year-old right-handed man with a remote history of **oropharyngeal squamous cell carcinoma treated with chemoradiation** over 20 years ago.

Symptoms — Progressive bilateral upper-extremity weakness and neuropathic symptoms, **worse on the left**, including burning, tingling, numbness, tightness, and impaired hand function.

Functional — Difficulty **picking up objects, tying shoes, and buttoning clothing**.

Workup — **Electrodiagnostics:** Axonal **left brachial plexopathy** with concomitant carpal tunnel syndrome and ulnar neuropathy at the elbow.

Prior treatment — Left carpal tunnel release provided no relief. Gabapentin was discontinued due to sedation and cognitive side effects. The patient continued rehabilitation for hand function.

PROCEDURE DETAILS

Ultrasound-guided left brachial plexus hydrodissection

Technique: The brachial plexus was identified in the anterior neck using an ultrasound approach similar to an interscalene block, with modifications for altered post-radiation anatomy. A lateral, in-plane long-axis needle approach was used with continuous ultrasound visualization. Injectate was delivered around the plexus after confirming needle position and negative aspiration.

Needle	Initial injectate	Repeat injectate
25-gauge, 1.5-inch advanced laterally under US visualization	3 mL 1% lidocaine + triamcinolone 40 mg/mL (40 mg) + 3 mL 10% dextrose	3 mL 1% lidocaine + 2 mL 10% dextrose without corticosteroid

OUTCOMES

Pain / Paresthesias

Stable and tolerable, no longer interfered with daily activities

Hand Function

Improved finger mobility, dexterity, and fine motor control

Repeat Response

Further subjective improvement in hand function

IMAGES

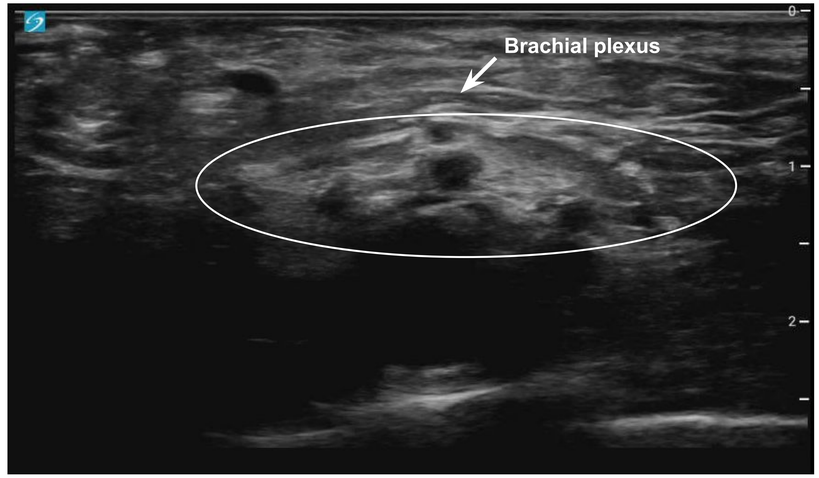


Figure 1. Pre-procedure ultrasound demonstrating post-radiation anatomy of the left brachial plexus.

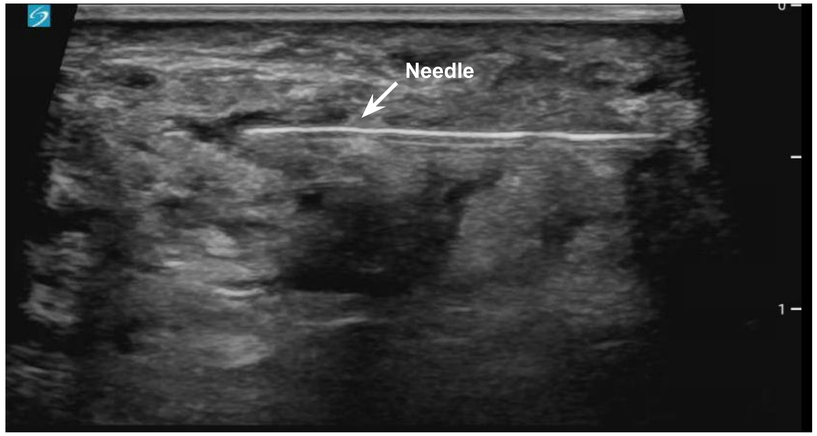


Figure 2. In-plane lateral needle approach during initial ultrasound-guided left brachial plexus hydrodissection.

DISCUSSION

Evidence gap: Hydrodissection is not an established treatment for radiation-induced brachial plexopathy, and direct evidence in RIBP remains limited.

Mechanistic rationale: Radiation-induced fibrosis may compress and tether neural structures, providing a potential rationale for mechanically separating the brachial plexus from surrounding fibrotic tissue.

Indirect support: Published experience with brachial plexus hydrodissection comes primarily from other neuropathic conditions, including cervical radiculopathy, where improvements in pain and neurologic outcomes have been reported.

Dextrose rationale: Perineural dextrose has been associated with improvements in pain and function in upper-extremity compression neuropathies and may provide neuromodulatory effects beyond the mechanical effect of hydrodissection, although its mechanism remains incompletely understood.

Clinical response: At follow-up, pain and paresthesias were stable and tolerable and no longer interfered with daily activities, while finger mobility, dexterity, and fine motor function improved.

Repeat response: Further improvement after repeat hydrodissection using lidocaine and dextrose without corticosteroid is notable and suggests the observed benefit was not limited to the initial steroid-containing injection.

CONCLUSIONS

Ultrasound-guided brachial plexus hydrodissection was associated with improved neuropathic symptoms and hand function in this patient with chronic RIBP.

Benefit was reported after both the initial and repeat procedures, including the second injection **without corticosteroid**, with no reported adverse effects.

These findings suggest hydrodissection may be a **minimally invasive adjunct** for selected patients with persistent symptoms when conventional management is limited.

Larger studies using **standardized pain scores, objective functional measures, and longer follow-up** are needed to clarify efficacy, durability, and optimal patient selection.

REFERENCES

1. Delanian S, Lefaix JL, Pradat PF. Radiation-induced neuropathy in cancer survivors. Radiother Oncol. 2012;105(3):273-282.
2. Lambi AG, Holy T, Tomlinson RE, Barbe MF. Radiation-induced brachial plexopathy: current understanding, diagnosis, and treatment options. J Hand Surg Glob Online. 2026;8(1):100896.
3. Shang X, Luan GR, Song YC, et al. Ultrasound-guided brachial plexus hydrodissection combined with acupotomy release for cervical spondylotic radiculopathy. Front Aging Neurosci. 2026;18:1846209.
4. Lam SKH, Reeves KD, Cheng AL. Transition from deep regional blocks toward deep nerve hydrodissection in the upper body and torso. Biomed Res Int. 2017;2017:7920438.
5. Azizi F, Saber Gharesoo F, Eidy F, et al. A systematic review and meta-analysis of the effectiveness of perineural dextrose injection in peripheral compression neuropathies of the upper limbs. Heliyon. 2025;11(1):e41622. doi:10.1016/j.heliyon.2025.e41622.

TAKE-HOME: Ultrasound-guided hydrodissection may offer a minimally invasive adjunct for neuropathic symptoms and functional impairment in selected patients with RIBP.