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Assessment of epidural fat at C7-T1 with image review prior to cervical interlaminar epidural steroid injections

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In 2015, the Multidisciplinary Pain Workgroup suggested that cervical interlaminar epidural steroid injections should “be performed at C7–T1, but preferably not higher than the C6–C7 level” after reviewing “prior imaging studies that show there is adequate epidural space for needle placement at the target level.”¹ However, clear guidance regarding what defines the word “adequate” in this context is lacking.² Images have previously been published that demonstrate the benefit of T1-weighted magnetic resonance imaging (MRI) in visualizing epidural fat compared to T2-weighted MRI.³ To the best of our knowledge, imaging showing a lack of “adequate” epidural fat at the C7–T1 level has not previously been published. We present images (Figures 1A–C) for a patient who presented with left-sided cervical radiculopathy due to C5–C6 and C6–C7 disc herniations without C7–T1 pathology.

These images reinforce that it is critical to review imaging, and not just the official radiology report, prior to performing cervical interlaminar epidural steroid injections. In particular, a lack of pathology (eg, no mention of central canal stenosis, as is the case in this patient) at the C7–T1 level does not guarantee that performing an injection at the C7–T1 level is safe. If the procedure is performed at the C7–T1 level and there is inadequate space for the needle, risk of dural puncture is increased, which could result in neurological complications that would have been avoidable had imaging been reviewed beforehand. In cases where epidural fat is not visualized at the C7–T1 level, it may be reasonable to perform the injection at a more caudal level with “adequate” epidural fat, such as the T1–T2 level in this patient.

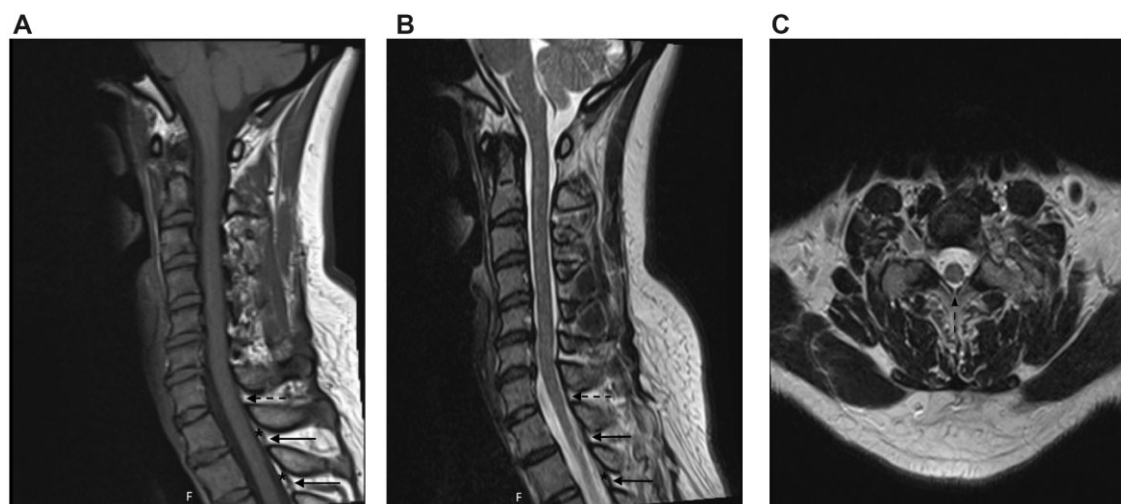


Figure 1. **A.** Cervical spine T1-weighted MRI, midline sagittal plane. Note the solid arrows at the T1–T2 and T2–T3 levels pointing to ligamentum flavum. Immediately ventral to ligamentum flavum is “adequate” epidural fat, which appears as a white structure that lies between the dura and ligamentum flavum and is demarcated by an asterisk (*). Also, note the dotted arrow at the C7–T1 level that reveals no appreciable epidural fat or ligamentum flavum, which is significantly different in appearance compared to the T1–T2 and T2–T3 levels. **B.** Cervical spine T2-weighted MRI, midline sagittal plane. Note the dotted arrow at the C7–T1 level that reveals neither appreciable ligamentum flavum nor epidural fat, which if present, would appear as a sliver of white just dorsal to the thecal sac. At the T1–T2 and T2–T3 levels, ligamentum flavum is noted (solid arrows). Significant epidural fat is notable at the T2–T3 level (*), while only a miniscule amount is notable at T1–T2. **C.** Cervical spine T2-weighted MRI, axial plane at the level of the C7–T1 disc. Note the dotted arrow that points to a gap in ligamentum flavum, indicating that the ligamentum flavum is not fused in the midline. Additionally, there is no appreciable epidural fat, which if present, would appear as a sliver of white just dorsal to the thecal sac.

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