

in low back pain with radicular pain: A randomized, double-blind, active-control trial. *Pain Physician* 2014; 17:277–90

10. Candido KD, Rana MV, Sauer R, Chupatanakul L, Tharian A, Vasic V, Knezevic NN: Concordant pressure paresthesia during interlaminar lumbar epidural steroid injections correlates with pain relief in patients with unilateral radicular pain. *Pain Physician* 2013; 16:497–511
11. Ghai B, Vadaje KS, Wig J, Dhillon MS: Lateral parasagittal versus midline interlaminar lumbar epidural steroid injection for management of low back pain with lumbosacral radicular pain: A double-blind, randomized study. *Anesth Analg* 2013; 117:219–27
12. Bonica J: Continuous peridural block. *ANESTHESIOLOGY* 1956; 17:626–30
13. McLean JP, Sigler JD, Plastaras CT, Garvan CW, Rittenberg JD: The rate of detection of intravascular injection in cervical transforaminal epidural steroid injections with and without digital subtraction angiography. *PM R* 2009; 1:636–42
14. Lee MH, Yang KS, Kim YH, Jung HD, Lim SJ, Moon DE: Accuracy of live fluoroscopy to detect intravascular injection during lumbar transforaminal epidural injections. *Korean J Pain* 2010; 23:18–23
15. Candido KD: Critical items to consider before adopting advocacy of digital subtraction angiography. *Pain Physician* 2015; 18:37–8

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The Devil Is in the Details

To the Editor:

In a consensus opinion by the multidisciplinary group regarding the safeguards to prevent neurological complications after epidural steroid injections, Rathmell *et al.*¹ correctly point out that the number of cases with catastrophic neurological injury related to epidural steroid injection is not trivial. Whereas spinal cord and brain infarction secondary to particulate steroid embolization is an important concern, it is to be noted that in a recent analysis of malpractice closed claims, neurological injuries related to direct needle trauma outnumbered the injuries related to spinal cord or brain embolic infarction.² In this analysis, fluoroscopy was used in 76% of cases in which neurological injury occurred; hence, mere use of fluoroscopy does not guarantee safety.² In the current consensus, the authors correctly point out that in addition to the anteroposterior view, the lateral or the contralateral oblique (CLO) view may be used to gauge needle depth.

Given that devastating injuries continue to occur despite the use of fluoroscopy, an important safety question is, “does a lateral fluoroscopic view reliably visualize the needle tip and estimate the depth of insertion particularly at the C7-T1 level?” The limitation of the lateral view in providing good needle tip visualization when accessing cervical or cervicothoracic epidural space by the interlaminar approach was highlighted by our study where the needle tip was not visualized or not well visualized in the lateral view in 16 of 24 cases in the low cervical and upper

cervicothoracic spine.³ Furthermore, the lateral view did not provide consistent location of the needle tip in the epidural space with respect to bony landmarks.³ These limitations of the lateral view could account for some cases of spinal cord injury despite the use of fluoroscopy. In contrast to this, the CLO view provided crisp visualization of the needle tip and less variability in needle tip location when visualized at an angle of 50 degrees. Based on this, we propose that the preferred use of the CLO view for depth of insertion during interlaminar epidural access has the potential of reducing complications related to direct spinal cord injury. This is likely to be especially true in cases where the needle tip is not well visualized in the lateral view. Correct use of the CLO view as well as the pitfalls of the lateral view should be taught routinely in fellowships and in society educational workshops to promote the safe access to the epidural space.

Competing Interests

The authors declare no competing interests.

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References

1. Rathmell JP, Benzon HT, Dreyfuss P, Huntoon M, Wallace M, Baker R, Riew KD, Rosenquist RW, Aprill C, Rost NS, Buvanendran A, Kreiner DS, Bogduk N, Fournay DR, Fraifeld E, Horn S, Stone J, Vorenkamp K, Lawler G, Summers J, Kloth D, O'Brien D Jr, Tutton S: Safeguards to prevent neurologic complications after epidural steroid injections: Consensus opinions from a multidisciplinary working group and national organizations. *ANESTHESIOLOGY* 2015; 122:974–84
2. Rathmell JP, Michna E, Fitzgibbon DR, Stephens LS, Posner KL, Domino KB: Injury and liability associated with cervical procedures for chronic pain. *ANESTHESIOLOGY* 2011; 114:918–26
3. Gill JS, Aner M, Jyotsna N, Keel JC, Simopoulos TT: Contralateral oblique view is superior to lateral view for interlaminar cervical and cervicothoracic epidural access. *Pain Med* 2015; 16:68–80

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Insufficient Clarity of Statement 6 in the Consensus Opinions to Prevent Neurologic Complications after Epidural Steroid Injections

To the Editor:

I read with interest the consensus opinions to prevent neurologic complications after epidural steroid injections in the May 2015 issue.¹

The working group deserves the thanks of practitioners of interventional pain medicine. The statements serve to direct