Transforaminal cervical epidural steroid injection

Transforaminal cervical epidural injection with steroids (C-TFESI) is a common treatment for upper extremity radicular pain or neck pain.

They have become a mainstay in the treatment algorithm for painful cervical radiculopathy.

However, its efficacy conceivably may depend on needle-tip placement, linking the degree of pain reduction achieved to the pattern of contrast dispersion.

The therapeutic response to C-TFESI and dispersion pattern of injected contrast failed to correlate in the study of Park et al. [1].

Complications

Rare but serious complications such as cerebellar or spinal cord infarction have been reported. The most probable causes of the serious complications include vertebral artery trauma, spasm, or accidental arterial injection of particulate steroid. Several recommendations have been made to improve the safety of CTFESI; however, evaluation and risk assessment of the patient's anatomy by the interventionist have not been sufficiently emphasized.

Vertebral artery trauma

Significant correlations between foraminal narrowing and proximity of the vertebral artery to the target of needle have been reported. This correlation is particularly problematic for interventionists because patients considered or referred for CTFESI are more likely to have foraminal narrowing at the level concerned. Without knowing the patient's anatomy, a common practice of rotating the C-arm obliquely to obtain a full view of the target foramen may carry significant risk of needle's encounter with the vertebral artery. Risk assessment through careful preprocedural review of the patient's magnetic resonance imaging by the interventionist is a worthwhile practice to optimize safety. Special attention should be paid to the vital structures such as the vertebral artery, neural foramen, and carotid artery. A preprocedural roadmap for the safest predicted needle trajectory can be created by simulation using the patient's available magnetic resonance imaging scans. These considerations may guide and help the interventionist to minimize the risk of inadvertent needle placement involving vital structures such as the vertebral artery or carotid artery [2].

Described techniques take extreme care to avoid cannulation of the vertebral artery during this procedure. Unexpected deviation of the artery, or an arterial segment, into the posterior neural foramen, the target zone for CTESI, increases the risk of intraarterial cannulation during injection. Accordingly, the practitioner must be aware of variant anatomy of the vertebral artery and take all precautions to avoid potential complications that may arise as a consequence [3].

Spinal cord ischemia

[4].

Pneumocephalus

Kim et al. present the first case of pneumocephalus after cervical transforaminal epidural injection of anesthetic and corticosteroids. A 64-yr-old woman with left C7 radiculopathy was undergoing C6-7 transforaminal epidural injection of anesthetic and corticosteroids. The epidural spread of contrast was checked by fluoroscope, and 5 mg of dexamethasone in 4 ml of 0.1875% ropivacaine was injected. She lost consciousness 5 mins after the procedure and regained awareness after manual ventilation. She subsequently complained of nausea and headache, and a computed tomography brain scan revealed pneumocephalus. After carefully assessing the fluoroscopic images, the authors believe that the needle may have punctured the dura mater of the nerve root sleeve, allowing air to enter the subdural space. Thus, fluoroscopic images should be carefully examined to reduce dural puncture when performing cervical transforaminal epidural injection of anesthetic and corticosteroids, and air should be completely removed from the needle, extension tube, and syringe [5].

1)
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