EDITORIAL VIEW

Transforaminal epidural block

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ABSTRACT

In this brief article, the author discusses salient features, historical perspective and merits and demerits of different approaches to spinal pain management in particular reference to available interventional pain techniques, including dorsal root ganglion, selective nerve root blocks and transforaminal injection etc.

Key words: Epidural block; Dorsal root ganglion; Selective nerve root blocks; Pulsed radiofrequency; Transforaminal injection

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In 1901, Sicard explained the therapy of sciatic pain with the injection of cocaine by caudal method.[1] First report of the lumbar epidural injection was done in 1921.[2] In 1934 fiscal herniation was introduced as a pressure cause to the nerve root and radicular pain.[3] The clinical use of corticosteroid formed a revolution in medicine in 1949.[4,5] In 1956 nerve inflammation was expressed as the pathophysiology of reticular pain.[6] The diagnostic value of selective nerve root injection in radiculopathy was introduced in 1971.[7] Although, transforaminal injection has been done widespread since 1952 but clinical usage of cervical transforaminal injectable lagged behind in 1988.[8] Transforaminal injection was able to recognize the affected nerve root and thanks to that it improved in 1990. But lots of complications were reported and it seemed we just see the top of an ice mountain. Because of this nowadays transforaminal technique is done with precaution and nerve root block and ultimately radiofrequency of a dorsal root ganglion is mostly done. Transforaminal epidural block is identified with diffusion of injected material in epidural space. After transforaminal injection; there is a possibility of a simultaneous block of sinovertebral disc, posterior longitudinal ligament, anterior dura mater and nerve root sleeve. Additionally, a sensory fiber of posterior subdivision of segmented nerve that gives nerve to adjacent muscles and nearby facet joints is blocked and sheath of fascia around the nerve root continues dura of the epidural space.[9] If needle tip had entered intervertebral foramen, solution that is injected around the nerve root might get into the epidural space so if the needle is injected near nerve root and lateral to the intervertebral foramen, it is called selective nerve root block, otherwise it is called transforaminal block.[10] But the usual way at the specification level of radicular complaints is still selective nerve root injection. After several reports about complications due to transforaminal injection caused by corticosteroid injection and vascular injury, nowadays it is done cautiously. And even in cervical zone is no recommended anymore and selective nerve root block and so radiofrequency of dorsal root ganglia are substituted.[11] In the lumbar region, it is only suggested under L3 during real time imaging and with the help of digital subtraction angiography. It has been suggested to first use a test dose of local anesthetic. After 1 to 2 minutes controlling nerve pain symptoms the patient is asked to move his or her legs to rule out a sudden paresthesia based on medullary ischemia, then steroids are injected. Above L3, selective nerve root injection is done. In the algorithm of chronic lumbosacral radicular pain after ruling out red flags and full of conservative treatment, first attempt is selective nerve root block. After that, pulsed radiofrequency of a dorsal root ganglion is suggested.[9] In thoracic zone selective nerve root block is used in recognition of thoracic radicular pain, and then pulsed radiofrequency of dorsal root ganglia should be done. In this region intercostal nerve injection is done instead of selective injection of nerve root (blockage of intercostal segment that has the highest decrease in pain is selected), but at T11 and T12 level, selective nerve root injection is done just like lumbar area. There are risks of pneumothorax and injury of vascular, nervous and visceral organs. Because of anterior position of intervertebral foramina and rib angle, thoracic dorsal root ganglia radiofrequency is difficult. Above T7 drill must be used and lamina be penetrated to reach dorsal root ganglia, but pulse radiofrequency of intercostal nerve can be used instead. Under T7, selective

nerve root injection and thoracic dorsal root ganglia is like lumbar part, but upper T7 needs a lot of experience. In algorithmic approach for the treatment of thoracic radicular pain, first attempt is a diagnostic block of intercostal nerve and in some cases that are resistant to cure pulsed radiofrequency of a dorsal root ganglion is done.[12] In sacral nerves, procedure is done in the anterior division instead of dorsal root ganglion because it is more proximal and it is a bit different with a lumbar transforaminal injection. Like thoracic zone we need to use burr hole and Kirrschner wire and small pneumatic drill to reach dorsal root ganglion. Because of that a curved cannula is often used and it is placed with the help of angiocatheter.[9] In the cervical region selective injection of nerve root or dorsal root ganglion radio frequency is done in the same way but injection site is a bit far from vertebral artery and radicular arteries and recommended injectate volume and distribution of the contrast agent is different and the side effects are less than transforaminal injection. In selective nerve root block drug distributes along selected nerve route and it avoids epidural space. In the treatment algorithm of chronic cervical radicular pain, first attempt is a selective block of nerve root and then pulsed radiofrequency of dorsal root ganglion.[11]

Transforaminal epidural block has many therapeutic and diagnostic values. There is ample evidence for this block but complications must be explained and discussed with the patient before injection

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