

Transforaminal Epidural Block or Selective Nerve Root Block?

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Radicular pain is a symptom and is with the formation of ectopic impulse and is not equivalent with radiculopathy that is accompanied with neurologic signs (sensory and motor changes). Radicular pain in worsening contextual factor transforms to radiculopathy.

Spinal nerve root contrary to peripheral nerve has no specific intraneural blood-nerve barrier and so it is more prone to symptomatic compression injury and the formation of endoneural edema. Following to nerve root pressure, vascular porosity increases and endoneural edema forms. With endoneural fluid pressure, capillary blood circulation decreases and can create intraneural fibrosis, which has a vital role in creating radiculopathy because 58% of spinal nerve roots nutrition is from cerebral spinal fluid (CSF). Fibrosis around nerves interferes with nutrition from CSF and causes nerve roots hyperesthetic and hypersensitive to compressive forces. Capillary stasis with congestion is also effective. That with the creation of pathologic biochemical changes contributes to radicular pain. When experimentally induced ischemia is formed, pressure for radicular arterioles occlusion is high. Even though, nutrition from CSF in low pressure of radicular arteries during fibrosis and epidural inflammation is scarce. Rapid onset of neural and vascular compromise more than gradual mechanical pressure causes symptomatic radiculopathy. Nowadays, the main function of the inflammatory nucleus pulposus in the creation of epidural inflammation and spinal pain is distinct [1-3]. Injection in surrounding nerve controls inflammation and can stabilize the sensitized neural reaction due to pain. The usual way in the specification level of radicular pain is selective nerve root block. The selective nerve root block is marked by the diffusion of injected material in the nerve root path, but not epidural space in contrast to transforaminal technique that is injected into anterior epidural space. Most of the time transforaminal epidural block and selective nerve root block used interchangeably, but sometimes considered to be separate [1-7]. Although main indication of SNRB is still radicular pain, there are many other indications for this block.

	Indications	Contraindications	Complications
Diagnostic	<ul style="list-style-type: none"> - Diagnosing inflammation of a nerve root with a history of radicular pain when neurophysiology studies is not beneficial - Diagnosing the cause of pain when a lot of factors come out - Diagnosing of painful disc when several discs are involved - Diagnosing the cause of pain in hip and spine - Distinguishing the engaged root in spondylolisthesis - Identifying the sufferer level in the narrowness of multiple levels - Recognizing the sufferer level in fibrosis after operation - Perineal pain** 	<ul style="list-style-type: none"> Patient refusal -Coagulopathy -Allergy to injective material -Infection of injection site -High pressure of inner cranium -Not corrected severe hypovolemia -Pregnancy -Motor deficit -Cauda equine syndrome -Medullar cone symptoms -Contained big hernia or sequestered herniation -Compressive radiculopathy -Uncontrolled major depression or neurosis -Uncontrolled or acute internal disease 	<ul style="list-style-type: none"> -Pain after injection -Anterior spinal artery syndrome -Embolism lead to paraplegia or quadriplegia or nystagmus, confusion and coma -Directed injury of the spinal cord -Dissection of the vertebral artery and breakup of blood brain barrier causes ischemia and brain death followed by high pressure in the cranium -Neurological complains caused by directing nerve damage -Transient blindness followed by temporarily intra-epidural pressure increase -Pneumothorax *

<p>Therapeutic</p>	<ul style="list-style-type: none"> -Spasmodic or constant pain that causes disability in patients with VAS (visual analog scale) of 5 on a scale of 0 to 10 -Backache or chronic leg pain that had no response to the usual treatment -Backache caused by disc hernia or radiculopathy -Discogenic pain -Narrowness of canal -Failed back surgery syndrome (FBSS) -Epidural fibrosis and radicular pain - Radicular spondylotic pains (traumatic or non traumatic) -Radicular pain that is not curable or has no operation for -Radicular pain that does not need emergency operation or operation is contra indication -Neuralgia after herpes -Narrow canal especially in foraminal stenosis - Anatomical problem when translaminar access is not possible -Stupm and phantom pain -radiculitis due to arthritis, infection or inflammatory exudates - Pressure to nerve root due to osteoporosis, vertebral collapse and metastase - Intercostal neuralgia and pressure to nerve because of rib phatalogy or pseudo arthritis and intercostobrachial neuralgia * -Perineal pain, painful diabetic neuropathy ,bladder dysfunction followed by cauda equina trauma, bladder spasm ** 	<ul style="list-style-type: none"> - A chronic disorder that is a barrier for out coming assessment - Pilonidal cyst and congenital abnormality of dural sac ** 	<ul style="list-style-type: none"> -Infection (epidural abscess , meningitis ,vertebral osteomyelitis , discitis) -Bleeding (epidural hematoma) and retroperitoneal hematoma -Allergic reaction -Dural puncture and following headaches -Intravascular injection (in the sacral zone there is a high possibility of intravascular injection because of high vascularity, -Arachnoiditis -Consequent of steroid injection , like suppression of cortisone level for up to 2 weeks and increase in blood glucose level -Vasovagal reaction -Ataxia especially for cervical block -Epidural lipomatosis -Cauda equina syndrome
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Table 1: Indications, contraindications and complications of TFEP & SNRB.

**specific for sacral region.

*specific for thoracic region.

Anatomic evaluation of this small space has attracted scientific interest because of the complications from the injections, which sometimes can be fatal (e.g. intervertebral space adjacent the vascular network especially the Adamkiewicz). If the conventional technique named based on the putting needle in the epidural space, especially the anterior epidural space which is near this vascular network, known as transforaminal injection, putting the needle on the nerve root can be called selective nerve root injection. Transforamen injection due to multiple complications cautiously used today and SNRB is done instead [1-3,8].

It seems that putting needles in different parts of the space have the same clinical effects but with different complications. To learn more about the intervertebral foramen considers it schematically into several divided spaces. Intervertebral foramen divided into three sections schematically from anterior to posterior by using cadaveric specimens and different types of radiographic contrast material distributions studied. On the basis of anatomic sections, from anterior to posterior; type 1 injection was intraepineural; type 2, extraepineural; and type 3, paraneural and both the early and late responses had no significant differences [9].

Despite the split of the intervertebral foramen from anterior to posterior there is another division that refers to 3 sections of the intervertebral foramen from top to the bottom; middle, superior and inferior. Regularly transforaminal entry was carried out by entering the foramen at the superior aspect. New studies express according to the Adamkiewicz artery location opposed to normal ways of lumbar injection and thoracic that needle located in the posterior and superior foramen, it would be better if the needle located in inferior and posterior foramen [10].

Manchikanti has gone even further and consider all complaints of transforaminal injection due to the safe or superior triangle and recommended to put the needle away and around the nerve root by an infraneural approach [11].

Conclusion

Regarding to sever complications reported due to transforaminal epidural injection, it is suitable to consider an alternative for it. By comparing safety and efficacy of SNRB and less reported complications of it with the inferior posterior approach, it seems SNRB could be the alternative for transforaminal method.

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