

# PARAPLEGIA FOLLOWING SELECTIVE NERVE ROOT BLOCKS



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There have been several recent cases of acute paraplegia following left lower thoracic transforaminal injections. These patients were apparently healthy without underlying medical problems. The presumed etiology of the neurologic insult was disruption of the artery of Adamkiewicz leading to anterior spinal artery ischemia resulting in anterior cord syndrome from cord infarction.

The artery of Adamkiewicz has been touted to be the dominant arterial supply for the anterior portion of the spinal cord for the lumbosacral enlargement. This artery is variable in its position and presence as it enters the spine from as high as T-7 and as low as L-4 and is derived from left sided spinal or intercostal arteries in up to 80% of individuals. The blood flow to the anterior two thirds of the mid thoracic and lumbosacral portion of the spinal cord is characterized by a watershed type of circulation. There is a paucity of vascular feeders to the spinal cord. The anterior radicular arteries are typically larger than their posterior counterparts, however they are fewer in number. The artery of Adamkiewicz is the principle blood flow to the lumbosacral enlargement and like other radicular arteries typically enters the spinal canal along the anterior superior aspect of the spinal nerve.

The usual method of placing a needle tip for performing a left sided selective nerve root injection at the mid thoracic to upper lumbar region may potentially place the artery of Adamkiewicz at risk. The typical posterior oblique approach for these injections advances the needle tip until it contacts the posterolateral portion of the vertebral body such that the tip lies at the anterior superior foramen immediately under the pedicle. Usually this technique is performed easily and safely, however it may place patients at undue risk when it is performed in the upper lumbar or lower thoracic spine, particularly on the left. This is because the radicular arteries enter the spinal canal via the foramen usually intimately associated with the spinal nerve at its anterior superior quadrant. In addition, the artery of Adamkiewicz is an enlarged radicular artery supplying the predominant blood supply for the anterior 2/3 of the lumbosacral enlargement of the spinal cord.

A modified approach to selective nerve root injections in this area such as a posterior inferior placement of the needle tip within the foramen to the superior endplate of the inferior vertebral body may reduce the risk of disruption to the radicular artery. This approach places the needle tip away from the radicular artery. Implementing a protocol for these injections such as a modified technique, injecting contrast under real time fluoroscopy to evaluate for vascular uptake, the use of a non-particulate steroid preparation, and the avoidance of local anesthetics in the injectant solution may also reduce the likelihood of an insult to the Adamkiewicz artery. More research in this area is obviously warranted to reduce the risk of this catastrophic outcome.

R. E. Windsor, MD - Continued

Editors note: The three sustained-release corticosteroids available in the United States are all suspensions NOT solutions. They vary in particle size with Celestone-Soluspan (betamethasone) having the smallest particle size, then Aristocort or Kenalog (triamcinolone), followed by Depomedrol (solumedrol) having the largest particle size. If an intra-articular injection occurs, it would theoretically cause less arterial obstruction and therefore less tissue damage with smaller particles. This is the opinion of the authors and of the editor. We welcome comments and discussion in this matter. The same reasoning would hold for cervical spine injections. Feeder arteries to the spinal cord and vertebral artery with its distal branches would be less impacted with a smaller particle, sustained release corticosteroid.