

Letter to the Editor

RISK OF SPINAL CORD INJURY WITH INTERLAMINAR CERVICAL EPIDURAL STEROID INJECTIONS, RELATED TO THE DORSAL MUSCULAR ARTERY, AND RETROGRADE FLOW

Marc J. Yland, MD

Cervical epidural steroid injections are performed either in interlaminar fashion, or by the transforaminal route. Both techniques have been in use for decades. While the interlaminar approach is perceived to be a safer option, the risk of spinal cord injury exists for both techniques. Spinal cord injury secondary to a transforaminal cervical epidural steroid injection was first reported to have occurred in 1997 (1), and there have been additional reports since (2). Spinal cord injury occurs in interforaminal injections when particulate steroid is injected inadvertently into an artery, such as a radicular artery, and embolizes into the spinal cord. Spinal cord injury is less of a concern with interlaminar injections, because no feeding artery appears to be located in the interlaminar plane. To my knowledge, Bose reported the only instance of spinal cord injury using an interlaminar approach (3). Bose suggested that the injury had been caused by a vasospastic event, rather than embolization, and recommended to avoid injecting above C7. Unfortunately, in the United States, and New York State in particular, many complications remain unreported pending litigation. Closed claims analysis may easily take more than a decade to be published. Thus, other incidents may have occurred.

The arterial blood supply to the spinal cord has been studied by many in detail. The cervical spinal cord has extensive collateral blood supply, from the vertebral arteries, the deep cervical arteries, the ascending cervical arteries, the basilar artery, all of which supply the 2 posterior cervical arteries as well as the anterior cervical artery (4). Despite this extensive network of collateral arteries, damage to a dominant radicular medullary artery, such as the artery of cervical enlargement, could result in extensive cervical spinal cord ischemia (5). Ischemic injury may result from embolization and or vasospasm. In either scenario, ischemic damage is not limited to the tissue supplied by the artery, but may also occur in alternate structures by means of retrograde flow into collateral arteries.

When an interlaminar injection is performed, there is the possibility of penetrating the dorsal muscular branch of the posterior intercostal artery. The posterior intercostal artery arises from the aorta, and also feeds into arteries supplying the spinal cord. Thus, retrograde flow into the spinal cord may occur when using a posterior interlaminar approach. The relevant anatomy has been described in detail by Thron, Lanz, and Schoenen (6,7). These are small arteries, and in my opinion, this risk is increased when using higher-gauge needles.

A similar mechanism of injury has been discussed in the pediatric literature in the past (8). In children, routine intramuscular injections of benzathine penicillin have been reported to cause spinal cord injury, also referred to as transverse myelitis, as early as 1966. At the time, the authors postulated that these complications occurred following inadvertent arterial injection and subsequent retrograde flow of particulate penicillin from the upper gluteal artery, into the iliac artery, and back into the abdominal aorta (9).

Author for correspondence: Marc J. Yland, MD
Address: Interventional & Multidisciplinary Pain Management PC
2500 Nesconset Highway, Building 24C, Stony Brook, NY, 11721
E-mail: office@yland.com

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