

# [Relevance of nerve blocks in treating and diagnosing low back pain--is the quality decisive?]

[Article in German]

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## Abstract

Diagnostic nerve blocks: The popularity of neural blockade as a diagnostic tool in painful conditions, especially in the spine, is due to features like the unspecific character of spinal pain, the irrelevance of radiological findings and the purely subjective character of pain. It is said that apart from specific causes of pain and clear radicular involvement with obvious neurological deficits and corresponding findings of a prolapsed disc in MRI or CT pictures, a diagnosis of the anatomical cause of the pain can only be established if invasive tests are used [5]. These include zygapophyseal joint blocks, sacroiliacal joint blocks, disc stimulation and nerve root blocks. Under controlled conditions, it has been shown that among patients with chronic nonradicular low back pain, some 10-15% have zygapophyseal joint pain [58], some 15-20% have sacroiliacal joint pain [36, 59] and 40% have pain from internal disc disruption [60]. The diagnostic use of neural blockade rests on three premises. First, pathology causing pain is located in an exact peripheral location, and impulses from this site travel via a unique and consistent neural root. Second, injection of local anaesthetic totally abolishes sensory function of intended nerves and does not affect other nerves. Third, relief of pain after local anaesthetic block is attributable solely to block of the target afferent neural pathway. The validity of these assumptions is limited by complexities of anatomy, physiology, and psychology of pain perception and the effect of local anaesthetics on impulse conduction [28].

Facet joints: The prevalence of zygapophyseal joint pain among patients with low back pain seems to be between 15% and 40% [62], but apparently only 7% of patients have pure facet pain [8, 29]. Facet blockade is achieved either by injection of local anaesthetic into the joint space or around the medial branches of the posterior medial rami of the spinal nerves that innervate the joint. There are several problems with intraarticular facet injections, mainly failure to enter the joint capsule and rupture of the capsule during the injection [11]. There is no physiological means to test the adequacy of medial nerve block, because the lower branches have no cutaneous innervation. Medial ramus blocks (for one joint two nerves have to be infiltrated) are as effective as intraarticular joint blocks [37]. Reproducibility of the test is not high, the specificity is only 65% [61]. For diagnosis of facet pain fluoroscopic control is always necessary as in the other diagnostic blocks.

Sacroiliacal joint: Definitely the sacroiliacal joint can be the source of low back pain. Stimulation of the joint by injection in subjects without pain produces pain in the buttock, in the posterior thigh and the knee. There are many clinical tests which confirm the diagnosis, but the interrater reliability is moderate [53]. Intraarticular injection can be achieved in the lower part of the joint with fluoroscopic guidance only, but an accurate intraarticular injection, which is confirmed by contrast medium, even at this place is often difficult. It is not clear whether intraarticular spread is necessary to achieve efficacy.

Discography: Two primary syndromes concerning the ventral compartment have been described: anular fissures of the disc and instability of the motion segment. In the syndrome of anular tear, leakage of nucleus pulposus material into the annulus fibrosus is considered to be the source of pain. The studies of Vaharanta [71] and Moneta [41] show a clear and significant correlation between disc pain and grade 3 fissures of the annulus fibrosus. Intervertebral discs are difficult to anaesthetize. Intradiskal injections of local anaesthetics may succeed in relieving the patient's pain, but such injections are liable to yield false negative results if the injected agent fails to adequately infiltrate the nerve endings in the outer annulus fibrosus that mediate the patient's pain. In the majority of cases MRI provide adequate information, but discography may be superior in early stages of anular tear and in clarifying the relation between imaging data and pain [71]. Selective spinal nerve

injection: In patients with complicated radiculopathy, the contribution of root inflammation to pain may not be certain, or the level of pathology may be unclear. Diagnostic root blocks are indicated in the following situations: atypical topography of radicular pain, disc prolapses or central spinal stenosis at more than one level and monoradicular pain, lateral spinal stenosis, postnucleotomysyndrome. Injection of individual spinal nerves by paravertebral approach has to be used to elucidate the mechanism and source of pain in this unclear situations. The premise is that needle contact will identify the nerve that produces the patient's characteristic pain and that local anaesthetic delivered to the pathogenic nerve will be uniquely analgesic. Often, this method is used for surgical planning, such as determining the site of foraminotomy. All diagnostic nerve root blocks have to be done under fluoroscopic guidance. Pain relief with blockade of a spinal nerve cannot distinguish between pathology of the proximal nerve in the intervertebral foramen or pain transmitted from distal sites by that nerve. Besides, the tissue injury in the nerve's distribution and neuropathic pain (for instance as a result of root injury) likewise would be relieved by a proximal block of the nerve. Satisfactory needle placement could not be achieved in 10% of patient's at L4, 15% at L5 and 30% at S1 [28]. The positive predictive value of indicated radiculopathy confirmed by surgery ranged between 87-100% [14, 22]. The negative predictive value is poorly studied, because few patients in the negative test group had surgery. Negative predictive values were 27% and 38% of the small number of patients operated on despite a negative test. Only one prospective study was published, which showed a positive predictive value of 95% and an untested negative predictive value [66]. Some studies repeatedly demonstrated that pain relief by nerve root block does not predict success by neuroablative procedures, neither by dorsal rhizotomy nor by dorsal gangliectomy [46]. Therapeutic nerve blocks - facet joints: Intraarticular injection of steroids offer no greater benefit than injections of normal saline [8, 15] and long lasting success is lacking. In this case, a denervation of the medial branches can be considered. To date three randomized controlled studies of radiofrequency facet denervation have been published. One study [20] reported only modest outcomes and its results remained inconclusive, another study [72] with a double blind controlled design showed some effects in a small selected group of patients (adjusted odds ratio 4.8) 3, 6 and 12 months after treatment, concerning not only reduction of pain but alleviating functional disability also. The third study (34a) showed no effect 3 months after treatment. Discogenic pain: Intradiscal radiofrequency lesions, intradiscal injections of steroids and phenol have been advocated, but there are no well controlled studies. Just recently, intradiscal lesion and denervation of the anulus has been described with promising results, but a randomized controlled study is lacking up to now [31, 55]. Epidural Steroids: Steroids relieve pain by reducing inflammation and by blocking transmission of nociceptive C-fiber input. Koes et al. [33] reviewed the randomized trials of epidural steroids: To date, 15 trials have been performed to evaluate the efficacy, 11 of which showed method scores of 50 points (from 100) or more. The trials showed inconsistent results of epidural injections. Of the 15 trials, 8 reported positive results and 7 others reported negative results. Consequently the efficacy of epidural steroid injections has not yet been established. The benefits of epidural steroid injections seem to be of short duration only. Future efficacy studies, which are clearly needed, should take into account the apparent methodological shortcomings. Furthermore, it is unclear which patients benefit from these injections. In our hands the injection technique can be much improved by fluoroscopic guidance of the needle, with a prone position of the patient, and lateral injection at the relevant level and with a small volume (1-2 ml) and low dose of corticosteroid (20 mg triamcinolone in the case of a monoradicular pain, for example). In the case of epidural adhesions in postoperative radicular pain [50], the study of Heafner showed that the additional effect of hyaluronidase and hypertonic saline to steroids was minimal. In our hands there was no effect in chronic radicular pain 3 months after the injection.

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