

SPINAL NERVE BLOCK

A Diagnostic Test in Sciatica

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The cause of sciatica has been studied by blocking spinal nerves of the lumbosacral plexus in intervertebral foramina. The nerve, which is singled out with the aid of an image intensifier, is injected with 1 ml of 1 per cent Xylocain. If the Xylocain injection eliminates the sciatic pain, the surgeon may be confident that a true nerve-root compression is involved, and he can then explore as far as he finds necessary. The correlation between the site of compression and the level indicated by the test was confirmed by operation in 19 patients.

Key words: anaesthesia, local; sciatica, diagnosis; aetiology; intervertebral disc displacement, diagnosis

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Surgery has been a valuable method of treating sciatica since Mixter & Barr (1934) demonstrated the role that the rupture of an intervertebral disc plays in its aetiology. In order to plan the operation correctly, it is essential to determine the particular nerve root from which the patient's symptoms arise. Neurological signs have proved to be somewhat inaccurate for assessment of the level of disc herniation (Troup & Ulfes 1959, Knutsson 1961). Myelography appears to be a more reliable means for the determination of the vertebral level (Karaharju et al. 1974). However, a false negative result of myelography is a possibility and in cases of previous laminectomy the interpretation of positive findings may be difficult. Consequently, some other method of examination would be of value.

Injection of local anaesthetic has been recommended as a useful test in this re-

spect (Macnab 1971, Schultz et al. 1973, Krempe & Smith 1974). An essential part of this technique has been to inject contrast medium into the root sleeve in order to confirm the proper positioning of the needle. This is followed by the injection of a local anaesthetic, which will eliminate sciatic pain if the cause of pain is to be found somewhere along the course of this particular nerve root. We have carried out this test without contrast medium.

PATIENTS AND METHODS

The patient lies in the prone position with a cushion under the lower abdomen to bring the sacrum as close to the horizontal level as possible. With the aid of an image intensifier, a lumbar puncture needle is inserted towards the lateral part of the intervertebral foramen and moved cautiously until the patient experiences a sharp stab of sciatic pain. If the first sacral

Table 1. Myelographic and operative findings in patients in whom the level of spinal nerve compression was localized by a positive nerve-block test.

Spinal nerve compressed	Disc prolapse + Myelogram +	Disc prolapse + Myelogram --	Disc prolapse -- Myelogram --	Total
L III	-	-	1	1
L IV	-	-	-	-
L V	4	-	7	11
S I	1	2	4	7
	5	2	12	19

nerve is to be tested, the needle must be inserted into the first sacral foramen. In this way it will be possible to ascertain which of the spinal nerves produces the patient's typical pain. Following this, 1 ml of 1 per cent Xylocain is then injected into this nerve. Relief of symptoms will follow in a few minutes. Should a previously positive Lasègue test become negative, care must be taken in testing straight leg raising because there is a risk that the anaesthetized nerve root may be overstretched (Langenskiöld 1975).

This test has to date been used on 22 patients. In 19 of them, 11 men and 8 women, mean age 43 years, operation confirmed that a positive test had identified the actual nerve subject to compression (Table 1).

The cause of compression was a herniated disc in seven patients. In five of these the injection test correlated with a positive myelogram, the prolapse being found at the L IV-V level in four patients and at the lumbosacral level in one. In two patients with a negative myelogram, a herniation was found to be compressing the nerve root which the nerve block had identified as being affected. The intervertebral space was L V-S I in both cases.

In 12 patients with a negative myelogram no herniated disc was found at operation, but the level of compression had been correctly identified by the nerve block. The cause of compression was traced back to a bony entrapment of the intervertebral foramen in 10 patients, to constricting cicatricial adhesions around the nerve root in one, and to adhesions and lack of space in the spinal canal in one. In one of these 12 patients, the nerve root involved was L III, in seven it was L V, and in four S I. Three patients had previously been operated on for a herniated disc. It is worth mentioning that, outside this series, a false positive test was obtained in one patient in whom 5 ml instead of 1 ml Xylocain had been injected into the L V nerve at the presacral level. The symptoms were caused by a herniated disc compressing the S I root.

DISCUSSION AND CONCLUSIONS

It has been recommended that the correct position of the needle should be first confirmed by an injection of contrast medium (Macnab 1971, Krempen & Smith 1974). If the needle is not in the root sleeve, the sinuvertebral nerve may be anaesthetized, resulting in an incorrect evaluation of the sciatic problem (Krempen & Smith 1974). When the needle is inserted in the manner described above, it is intended to enter the spinal nerve beyond the dural sheath. Owing to the anatomy of this region (Pedersen et al. 1956), it is possible that both the sinuvertebral nerve, which passes through the intervertebral foramen, and the posterior ramus of the spinal nerve will be anaesthetized. However, this need not lead to a mistaken judgement, since the sinuvertebral nerve supplies the ventral dura and the posterior longitudinal ligament and, according to observations made during disc operations, under local anaesthesia, pain originating in these structures has solely a lumbosacral and not a sciatic character (Wiberg 1950). Such an injection may also suppress the pain that originates in the area of the first posterior branch of the spinal nerve. Although this kind of pain may radiate to the lower extremity, it should be distinguishable, by the absence of neurological signs, from radiating pain due to nerve-root compression (Steindler & Luck 1938, Sinclair et al. 1948). To pre-

vent anaesthesia from spreading into the spinal canal, only 1 ml Xylocain should be injected.

Our experience has shown that spinal nerve block in the lumbosacral region is a valuable test even without the information obtainable by contrast-medium injection. The techniques involved no complications or difficulties. We recommend this test for use whenever the level of nerve-root compression is uncertain, particularly when the myelogram is negative or difficult to interpret and compression at foraminal level is suspected.

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