THE TECHNIQUE OF ANTEROLATERAL CORDOTOMY*

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In 1933, 78 cases of anterolateral cordotomy were reported from the University of Michigan Hospital. At the time of this report the results in over 20 per cent of the cases were known to have been unsatisfactory either because the level of analgesia reached at operation was not sufficiently high or because a level which was adequate at first was not maintained. That we were not alone in these failures is attested by the variety of methods advocated for the relief of pain, only to be abandoned after ample trial. The failures in this series led us to modify the technique in many cases by carrying the cordotomy incision farther anterior in the cord substance.

In our report of 1937 on 12 cases of tabetic crises in which it was urged that the incision be carried "at least 2 mm. beyond the emergence of the anterior nerve root," the results were better, 10 being satisfactory, with 1 failure and 1 death 10 days postoperative.

A review just completed shows that we are still having a surprising number of failures. It can be generally stated, however, that when an incision 4 mm. in depth is carried well anterior to the emergence of the anterior nerve root under direct vision, high levels of analgesia are obtained and it is a rarity for such a level to fail.

Though the more anterior incision was arrived at empirically, the rationale of the procedure has since been demonstrated by Hyndman and Van Epps and by Walker on the human; and by Weaver and Walker on the monkey. This will be elaborated upon, following discussion of the selection of cases and the actual technique of operation, based upon an experience of over 300 cases.

SELECTION OF CASES

It was formerly our belief that morphine addiction, though not a contra-indication to cordotomy, played an important role in its failure as it apparently does in many procedures advocated for the relief of pain. Frazier stated that he had never seen morphine addiction in trigeminal neuralgia, and this has been our experience. It has even been suggested that the occurrence of morphine addiction was evidence against the pain being of organic nature. True drug addiction is probably caused by a psychogenic need which is ordinarily lacking in patients with an organic basis for pain. The latter, as a rule, are genuinely honest in their protestations that they wish to "get away from morphine." We now believe that most of the failures that were attributed to morphinism were in fact due to an imperfect cordotomy.

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In the selection of patients for cordotomy the greatest difficulty is met with in those individuals who seemingly have severe pain for which no satisfactory organic basis can be found. Such a patient is told that his pain cannot be evaluated objectively by the examiner but that if his pain is real it will be relieved by a properly performed cordotomy. He is also warned of the risk of permanent bladder disturbance, the loss of voluptuous sensation, and the possibility of paralysis. If this patient then elects operation, one can be more than reasonably certain that his pain is organic in nature. It is at least not malingered.

It is difficult to evaluate the pain of transverse myelitis when it is not purely radicular. In an Army paraplegia service of 136 patients for which one of us was neurosurgeon, approximately 10 per cent complained of severe pain. After several cordotomies had been performed, word passed rapidly around the wards as to the value of the procedure. Soon a dozen patients had been operated upon with excellent results in the 5-month period in which they were followed. One patient, however, of low intelligence with a marked depression was not improved in spite of a high level of analgesia.

An officer was recently seen by us who claimed to have had continuous pain from the onset of his paraplegia, which had occurred 2 years previously. He had at one time become a morphine addict but was relieved of addiction by his medical officer, who believed that the patient was actually not having pain and that cordotomy would be a mistake. We were of the opinion that the patient was suffering pain and accordingly a cordotomy was performed, with complete relief. A report just received 16 months post-operatively states that he has had no pain since operation. We still cannot be certain that the pain was not of psychogenic origin, but the psychiatrist had failed to relieve it, and with a complete paraplegia, the patient had so little to lose that operation seemed justified. The same may be said for the 12 patients operated upon in the Army hospital, though the fact that the first good results precipitated the others into operation, may mean that the element of suggestion entered. However, it may also mean that these men did not wish to submit to a purely destructive operation until they were reasonably certain of relief from pain. It should be remembered that when pain is a conversion mechanism, it is a crutch for a man to lean upon and he has the need to keep this crutch until he has a better one with which to support himself.

In the 6 cases of postherpetic neuralgia for which cordotomy was performed the results were not completely satisfactory in a single case. Three patients with analgesic levels above the postherpetic lesions had had their pain at least 3 years. Two of these showed definite evidence of cerebral arteriosclerosis and were thought to have an obsessive type of pain. The level in the third was only two segments above his chest lesions. Though the level persisted he was free of pain less than 2 weeks. In one case the level was not checked and in another the level fell. The most satisfactory case will be given in more detail: