The Establishment and Operation of a Nerve Block Clinic

One Year's Experience at the Los Angeles County Hospital

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SUMMARY

The Anesthesia Department at the Los Angeles County Hospital established a Nerve Block Clinic for the purpose of alleviating pain and providing helpful information for diagnosis in a number of diseases.

During the first year of operation of this Nerve Block Clinic, over one thousand injections were made. The patients who received the injections were referred to the Nerve Block Clinic by staff members who had been apprised of the services offered.

EVER since Halstead in 1885 demonstrated the use of cocaine as a local and topical anesthetic agent in the United States, physicians have been searching for better drugs and more efficient methods to alleviate the pain of surgical procedures and the pain produced by disease and injury. In recent years anesthesiologists have given more and more attention to non-surgical pain as their knowledge of nerve block procedures to alleviate it has increased. In particular this attention has been directed toward the treatment of the painful states of various diseases and trauma. About two years ago the Anesthesia Department of the Los Angeles County Hospital established a diagnostic and therapeutic Nerve Block Clinic. In preliminary consideration of the project, the first and basic requirement, of course, was a suitable room, preferably large enough to permit the treatment of several patients at one time and conveniently accessible to both hospital patients and out-patients. The room should also be in a quiet section of the hospital and, if possible, air-conditioned so that the temperature might be controlled at a constant level. These requirements were readily fulfilled except that air-conditioning was not available. The equipment necessary, in addition to a few pieces of furniture, was that already available to the modern anesthesia department, namely, an operating table, a liberal supply of various-sized needles, syringes, sterilizing solutions, local anesthetic agents, Pentothal,® and apparatus for delivering 100 per cent oxygen under positive pressure. Personnel requirements were met by the acquisition of a nurse whose duties consist of assisting the operator and caring for the equipment.

Once the necessary equipment had been assembled, the next step was the dissemination of information concerning the Nerve Block Clinic. Many physicians are, unfortunately, as yet unaware of the diagnostic and therapeutic services that an anesthesia department may render through such a clinic, so that this step is of vital importance. At the Los Angeles County Hospital this step was completed by three lines of action. First, a memorandum was sent to all department heads, house staff physicians, and the nursing department apprising them of the existence of the Nerve Block Clinic, its location, and a brief summary of the services it offered. Second, a member of the anesthesia service addressed a regular monthly meeting of the house staff, outlining the various types of pain syndromes that are amenable to nerve block therapy and the diagnostic procedures which are available. Third, the members of the anesthesia staff personally contacted all the senior resident physicians in the hospital and informed them of the functions of the Nerve Block Clinic. As a result of these measures, over one hundred patients were observed in consultation during the first month of operation of the Nerve Block Clinic.

The therapeutic procedures undertaken were performed as indicated after noting the referring physician's request, taking a careful history from the patient and completing a careful physical examination. Diagnostic procedures were also completed as requested unless contraindicated. The patient's history relevant to the condition under consideration was recorded along with an accurate summary of the objective signs before and after each nerve block. Subjective reactions of the patient were also noted in the record. The Nerve Block Clinic record of each patient was filed alphabetically so that it will be available for ready reference at each subsequent visit of the patient. A Hollerith punch card was completed for each case for the preparation of numerical statistics. Finally, a consultation report embodying the information noted was placed in each patient's chart. In the majority of cases the nerve blocks were performed by residents in the Anesthesia Department.

Before each nerve block is started, the nature of the nerve block must be explained to the patient and his written consent obtained for the procedure. This written permission is incorporated in the patient's permanent hospital chart. Favorable results from

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any nerve block procedure should never be promised. It should be emphasized to the patient that each nerve block is a therapeutic trial or a diagnostic test. However, the patient should be informed of the probable effect of the block on the pain which he feels or of the diagnostic information the proposed block should reveal. It is important, in addition, that the patient realize that a series of blocks may be necessary to accomplish the desired therapeutic or diagnostic results. One word of caution might well be injected at this point: Nerve block should not be repeated if, during the block or immediately after completion of the block, the condition under treatment is aggravated or the pain more intense. This, of course, does not apply to the momentary paresthesias which are necessarily produced in order to complete certain types of blocks. On the other hand, according to Livingston,[1] intensification of the pain after the effect of the local anesthetic agent has worn off warrants further blocking with the expectation of a better prognosis. It should also be ascertained at this time whether the patient has ever had a reaction to a previous injection of a local anesthetic agent.

There are a number of types of pain which usually can be successfully relieved by nerve block therapy. There are perhaps many more for which nerve blocking has little, if anything, to offer. For the most part, the effect a nerve block may have on pain in any case cannot be determined until a therapeutic trial has been made. Table 1 contains a list of painful syndromes in which nerve block therapy is usually successful.

TABLE 1.—*Pain Syndromes Which Usually Respond to Nerve Block Therapy*

1. Acute thrombophlebitis.
2. Acute herpes zoster.
3. Shoulder pain.
4. Phantom-limb.
5. Phantom-limb pain.
6. Causalgia.
7. Post-traumatic pain syndrome.
8. Postoperative neuritis.
9. Tic douloureux and trigeminal neuralgia.
10. Laryngeal tuberculosis.
11. Angina pectoris.
12. Trigger-point pain.
13. Low back pain.
14. Pain from malignancy (10 to 30 per cent).
15. Pain from peripheral vascular disease.

Table 2 lists some of the conditions in which nerve blocks may be of value from a diagnostic viewpoint.

The majority of patients referred to the Nerve Block Clinic had peripheral vascular disease. As a constant-temperature room was not obtainable, the diagnostic significance of temperature changes in these patients was of little value. However, a large number of these patients had pain to some degree as a result of the disease they had, and in nearly every instance this pain was relieved by blocking the lumbar sympathetic nerves. In addition, an improvement in the color of the skin was frequently observed, and many patients experienced a sense of warmth in the extremity.

TABLE 2.—*Diagnostic Nerve Blocking*

1. Peripheral vascular disease.
2. Herniated nucleus pulposa.
3. Low back pain.
4. Value of sympathectomy in hypertensive heart disease.
5. Differentiation of central and peripheral pain mechanisms.

Table 3 lists the types of nerve block and the number of times each was performed during a period of nine months.

TABLE 3.—*Nerve Blocks Performed in 1949*

Block	April 1-Dec. 31
Lumbar sympathetic	474
Epidural	300
Stellate	164
Thoracic somatic	37
Lumbar somatic	20
Spinal (diagnostic)	19
Suprascapular	17
Brachial plexus	11
Mandibular	5
Cervical plexus (deep)	4
Thoracic sympathetic	3
Intercostal	3
Phrenic	2
Mental	1
Infiltration (headache)	1
Caudal	1
Sciatic	1
Pudendal	1
Total	1,065

At the present, two solutions are in daily use at the Los Angeles County Hospital Nerve Block Clinic: procaine (0.5 - 2.0 per cent), and pontocaine (0.1 - 0.2 per cent). The pontocaine solutions have been used in over 500 nerve blocks without a single reaction of any kind being observed. The 0.1 per cent solution of pontocaine blocked the sympathetic nerves effectively, but, in the author's experience, did not completely anesthetize the major somatic nerves. Pontocaine in concentrations of 0.2 per cent was uniformly successful in blocking conduction along the major nerve trunks.

There are several general principles which should be kept in mind with regard to nerve block therapy.

First, the nerve block itself should not cause the patient to experience more pain than he already has.

Second, the block to be performed must not interfere with vital functions already compromised by disease.

Third, careful aspiration must be performed in two or more planes before each injection so that

the anesthestic solution may not be inadvertently injected into the blood stream, or into the pleural or subarachnoid spaces.

Fourth, the label of each solution must be read carefully before the syringe is filled.

And, fifth, no local, topical or regional anesthetic procedure should be undertaken without having ready for immediate use:

1. A syringe with needle attached containing Pentothal® in solution.

2. Equipment suitable for performing artificial respiration with 100 per cent oxygen under positive pressure.

3. Vasopressor drugs such as ephedrine sulfate and Neosynephrin.®

This equipment is absolutely essential for the successful treatment of a convulsive reaction following too rapid absorption of too great a quantity of a local anesthestic agent. The time factor is one of vital importance in the successful treatment of this type of reaction. If the convulsions are stopped immediately with an intravenous barbiturate and the patient ventilated artificially until his own respiratory efforts are adequate, the patient nearly always survives unharmed. If time is lost in mixing a solution or in assembling apparatus for administering oxygen, the patient usually dies. So far as is known, the barbiturates are not chemical antidotes for the local anesthetic drugs. Rather, the pharmacological action of the barbiturates in the treatment of such convulsions is simply one of depression of the motor cortex to the point where it will no longer respond to the stimulating action of the local anesthetic drug.

The mild type of "procaine reaction"—dizziness, anxiety, nausea—requires no treatment other than reassurance. It is self-limited to 10 to 15 minutes in duration. Premedication with the usual dose of a barbituric acid derivative will not prevent either of these types of reaction, although it may lessen the severity of the mild type.

REFERENCE

1. Livingston, W. K.: Pain Mechanisms. The Macmillan Company, New York City, 1944, p. 172.