THE USE OF EPIDURAL ANESTHESIA FOR EXCISION
OF THE LUMBAR DISC

REPORT OF 125 CASES*

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EPIDURAL or peridural anesthesia is a form of regional block which has many advantages over general or spinal anesthesia. This type of anesthesia has been used effectively and enthusiastically by many individuals.6–9,11,12,14 Its use in neurosurgery has been limited, and for this reason, the author wishes to report 125 consecutive cases of lumbar spine exploration under epidural anesthesia for excision of the intervertebral disc.

In the past few years, the introduction of more potent and longer lasting local anesthetic agents has made the use of epidural anesthesia in surgery more practical.1,4,10,12 The drugs that have been used most frequently are lidocaine (Xylocaine) and hexylcaine (Cyclaine). In the majority of the cases in this report, the operations were done with 2 per cent lidocaine, although in a few 1 per cent hexylcaine was used. Both have given excellent anesthesia, but the series is too small to be of comparative value. Ansbro and associates2 reported on the comparative use of these two drugs for epidural anesthesia in 2,000 cases of abdominal surgery. They preferred hexylcaine because of its lower incidence of toxicity. Crawford5 also reported that Xylocaine and Cyclaine possess a high degree of potency and a short latent period with prolonged action, but when used in smaller concentration and volume, the incidence of toxicity was low.

TECHNIC

The patient is placed on the operating table in the prone position, and the table is adjusted to flex the spine. After the skin is prepared with an antiseptic agent, a #16 Tuohy needle is passed into the epidural space under local anesthesia at the 3rd or 4th lumbar interspace (usually the space above the suspected level of disc herniation). When the large needle meets the ligamentum flavum, one can usually feel a resistance, and when it is thrust through the ligamentum, there is a characteristic feel to its penetration. Once the needle is in the epidural space, fluid will flow into the space with ease, whereas force is necessary to infiltrate fluid into the tissues down to the ligamentum flavum. A drop of fluid in the hub of the needle, or in a glass adaptor attached to the needle, will reflect the presence of a negative pressure in the epidural space and will show a rise and fall with inspiration and expiration. If the intrathecal space is entered, there will be a free flow of spinal fluid from the needle. When this occurs, the needle should be withdrawn and introduced at

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the space below. This was necessary in only 2 instances. Also, if a patient has had a spinal tap for routine study or myelogram in the past 24 hours, one should avoid giving the anesthesia at the level of the tap.

Once the needle is in the epidural space, about 1 cc. (20 mg.) of the anesthetic agent is injected without force. If in a few minutes no signs of spinal anesthesia have developed, the remainder of the anesthetic agent is injected slowly and the needle is withdrawn. The usual dosage used in this series was 20 cc. of 2 per cent lidocaine (400 mg.). The head of the table is elevated so that the fluid will gravitate caudally. The skin along the line of the anticipated surgical incision is then infiltrated with 1 per cent procaine containing adrenalin, and the table is leveled. Since the skin is slow to become anesthetized, drapes should not be clamped to the skin unless it is first infiltrated with procaine. The subcutaneous tissues are usually well anesthetized from the epidural anesthetic in a matter of 10 minutes. Occasionally the anesthesia is supplemented with an intravenous drip of Demerol, Nembutal or Sodium Pentothal. There are occasions when the patient will have a very large midline disc herniation blocking the caudal flow of the anesthetic agent, or one exerting marked pressure on the nerve root, preventing diffusion of the agent about the nerve. In such cases, the patient may complain of pain when the root is retracted to expose the herniation. A few drops of 1 per cent procaine injected directly into the nerve with a very fine needle will make anesthesia complete.

ANALYSIS OF 125 CASES

There were no deaths and no convulsive reactions. Seventeen patients (13.6 per cent) had a drop in blood pressure that required a vasopressor drug. Eighteen (14.4 per cent) had pain on root retraction or on removing the cartilage. The pain was relieved in 10 cases by injecting the nerve with procaine, and in the other 8 by giving a small amount of Sodium Pentothal intravenously.

ADVANTAGES

The patient can be positioned for the epidural injection and operation at the same time. He is able to assume a comfortable posture under his own power, and the possibility of brachial plexus or peripheral nerve injury is reduced. Having the patient awake in the prone position obviates the necessity of an endotracheal tube. The single injection technic of lumbar epidural anesthesia is relatively simple, and when supplemented with local infiltration of the skin, permits one to start the operation without delay. The advantages of doing an operation under local anesthesia bear emphasis. In recent years much stress had been placed upon the prevention of cardiac arrest, and even though cardiac arrest has sometimes been attributed to epidural anesthesia, the cause remains the same—namely, diminished oxygen tension. The author feels that this potential danger is less with epidural than with general anesthesia. Certain patients of poor physical status can be operated upon more safely under epidural anesthesia, particularly those with cardiac or pulmonary disease. In this series are 2 patients with previous coronary occlusion who showed no untoward effects from epidural anesthesia. In those patients with pulmonary disease in whom alveolar diffusion of oxygen is impaired, as with emphysema, bronchiectasis, asthma, and even in heavy smokers, epidural offers a definite advantage over general anes-
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thelia. Another very distinct advantage of epidural anesthesia, in my experience, is that less bleeding occurs than with general anesthesia. Muscle relaxation is consistently better. Other advantages over general anesthesia are virtual absence of postoperative nausea and vomiting, and less chance of atelectasis and pneumonia. Finally, the hazard of explosion is nil.

The advantages of epidural over spinal anesthesia are: (1) The danger of neurological sequelae which occasionally occur with spinal anesthesia, such as reported by Bergner and associates, is minimal. (2) There is no possibility of extension of the anesthetic agent intracranially, and the anesthesia can be carried into the cervical region without affecting respiration. (3) There is no post-anesthesia headache. (4) There is no temporary paraplegia. (5) There is no postoperative urinary retention. (6) A drop in blood pressure, when it occurs, is seldom profound or precipitous.

DISADVANTAGES OF EPIDURAL ANESTHESIA

A large dose of anesthetic agent is necessary for epidural anesthesia (400 mg. as compared with 20 mg. required for spinal anesthesia), and if injected intrathecally may prove disastrous. Complications can be avoided by first injecting 1 cc. (20 mg.) and waiting several minutes for any sign of spinal anesthesia before giving the full dose. It is a procedure that requires an experienced technician to administer, but one quite adaptable for the neurosurgeon. In this series of 125 cases, no intrathecal administration was encountered. Another disadvantage is the possibility of toxic reaction to the anesthetic agent. Ansbro et al. reported 11 instances of convulsive reactions in 1,000 cases of epidural anesthesia in which 2 per cent lidocaine was used (1.1 per cent incidence) and 1 reaction in an equal number of cases in which 2 per cent hexylcaine was the anesthetic agent (0.1 per cent incidence). In this report, there were no convulsive seizures or other severe toxic reactions to either drug. Intravenous fluids should be running, and oxygen should be available for positive pressure administration. Occasionally there is a fall in blood pressure, but this is associated more frequently with rapid injection of the anesthetic agent. The amount of adrenalin used in the procaine for skin infiltration may help counteract this drop in pressure. If not, methoxamine (Vasoxyl) or phenylephrine (Neosynephrine) intramuscularly will promptly restore the blood pressure to normal. It is felt that a moderate drop in blood pressure is a less serious complication than a marked rise. Fear of local anesthesia by the patient can be a disadvantage, but with adequate premedication or light Sodium Pentothal anesthesia, the patient seldom questions the operator as to what is being done. A case of aseptic meningitis following epidural anesthesia was reported by Jenicek.

SUMMARY

Epidural anesthesia is very satisfactory for excision of the lumbar intervertebral disc and has distinct advantages over general or spinal anesthesia. It was used in 125 consecutive cases without mortality or serious complications.
REFERENCES


8. GALBRAITH, J. G., and ANDERSON, M. N. Personal communication.


