INCIDENCE OF HEADACHE WITH USE OF 27 GAUGE SPINAL NEEDLE

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THE typical headache following spinal anesthesia is characterized by onset or increase of cephalalgia on sitting up and relief or cessation on lying down. This type of headache occurs after a subarachnoid puncture, when the continuity of dura and arachnoid is severed. Leakage through the hole in the membranes follows a lumbar tap (1, 2, 3), causing a low volume and pressure of cerebrospinal fluid (4, 5, 6). The incidence of headaches was found to be lower when a small needle was used than when a large one was employed (7, 8). From these observations, it may be assumed that a smaller needle causes less fluid leakage and fewer headaches. The low incidence of headaches following immediate ambulation (9, 10) indicates that factors other than fluid leakage may cause cephalalgia. When hypotonic fluids are administered after subarachnoid tap, the incidence of spinal headache is reduced (11, 12); this suggests that hydration also influences the occurrence of spinal headache. In addition, there is the recurrent observation in medical reports that the nervous patient is more susceptible to spinal headaches than the normal patient.

A personal survey disclosed that 30 per cent complained of headache following the use of a 15 gauge spinal needle (13). This frequency of cephalalgia stimulated us to undertake the present study. A special 5-inch, 27 gauge needle was devised for use in determining the incidence of spinal headache. The flexibility of the needle made it necessary to modify the usual puncture technic.

TECHNIC WITH A SMALL GAUGE NEEDLE

The positioning and preparation of the patient was routine. A 20 gauge spinal needle was first inserted through the skin and advanced as close to the ligamentum flavum as possible without penetrating that structure. The 27 gauge spinal needle was then inserted through the lumen of the 20 gauge needle and advanced through the ligamentum flavum, dura and pia (fig. 1). When the 27 gauge needle encountered bony resistance, both needles were withdrawn and the 20 gauge redirected. It was possible to appreciate the usual snap of the dura with the 27 gauge needle. No attempt was made either to split or cut the dural fibers by positioning the bevel of the needle. On occasions

when the operator advanced the 20 gauge needle too cautiously, and the 27 gauge needle hub reached the hub of the 20 gauge needle before penetration of the ligament or dura, then the 20 gauge needle was again advanced to bring it closer to the ligament. Spinal fluid did not leak out of the needle when a tap was successfully made, since the small bore of the needle offered too much resistance. Aspiration with a dry 2 cc. syringe confirmed the tap. Since aspiration of spinal fluid through the 27 gauge needle is difficult even with a successful tap, the anesthetic solution was mixed and diluted without the use of cerebrospinal fluid.

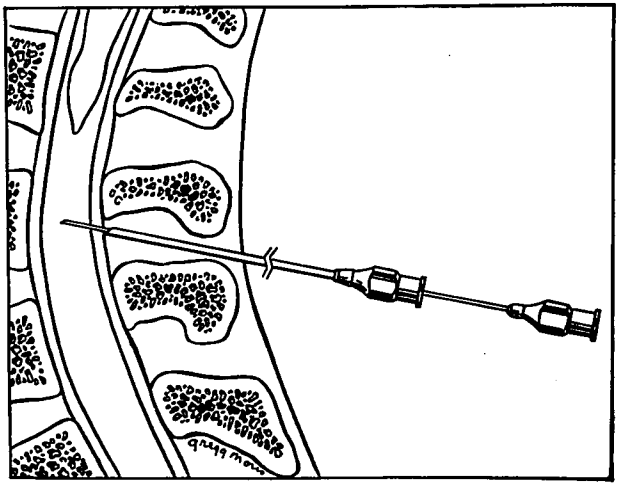

FIG. 1.

Injection was slowed considerably by the small lumen of the 27 gauge needle. To achieve the correct level of anesthesia, it was necessary to position the patient and vary the site of the injection. *Pontocaine* was weighted with *procaine 5:1* instead of glucose.

SELECTION AND EVALUATION OF PATIENTS

All of the subjects were patients in an Army General Hospital, chiefly from the younger age group. They were predominantly male, No selection was practiced; expediency ruled the choice of subject and operation. Surgical procedures included appendectomies, herniorrhaphies, prostatectomies, hemorrhoidectomies and a large number of bone and skin plastics of the legs. Only those patients who had a

single dural puncture with the 27 gauge needle were included in the series. If the 20 gauge needle punctured the dura or a possibility existed that the 27 gauge needle made more than one dural hole, the case was not included in this study.

No survey was made of ambulation time, hydration of the patient and other complications. Patients were followed to the tenth postoperative day.

Interrogation was standard. The patient was asked if he had any discomfort in his legs, then his back, and so on to include his chest, neck and head. All complaints led to further questioning by the observer, who manifested an interested manner. If questions about head discomfort received a negative answer, then the patient was asked point-blank if he had a headache. One typical headache was elicited only by this direct interrogation. This patient explained that he did not feel his discomfort of sufficient severity to be mentioned.

The typical spinal headache was recognized as any discomfort of the head or neck which started or was aggravated by sitting up, and ended or was relieved by lying down—regardless of duration. In one case a headache lasted only an hour during the first postoperative day.

RESULTS

Of 100 patients observed, only 5 per cent were noted to have typical spinal headache. Two of these patients had a history of migraine headaches, a third had a history of frontal headaches, while another of the 5 patients had a typical headache lasting only one hour.

Twelve other patients reported neck or head discomfort. Of these 12, 8 were not affected by change of position, and the remaining 4 were relieved when they sat up or raised their heads on a pillow. One other patient in the group reported a tingling in the frontal area when he sat up, but it caused him no discomfort. Even upon close questioning, he stated it did not disturb him.

DISCUSSION

Successful subarchnoid taps are possible with a 27 gauge spinal needle. When a patient has increased intracranial pressure and a small dural hole is sought, this technic could be used to advantage. The fluid loss is less and slower through a hole made by a 27 gauge needle than through a hole made by an 18 gauge needle.

This technic, however, was not found to be satisfactory for routine anesthetics. The time necessary to make the puncture was increased —its principal disadvantage. Two needles had to be manipulated to change the direction of advance. Occasionally a satisfactory level of anesthesia was not obtained. Greater care in positioning the patient and high lumbar taps are sequels to the slow rate of injection. The use of the 2 cc. syringe for aspiration further increased the time factor when this technic was employed.

Aspiration of the spinal fluid for dilution of the anesthetic mixture was not done. There was, as a result, little immediate fall of cerebrospinal fluid pressure from the tap. Actually, an increase of pressure occurred when the anesthetic solution was injected. What effect these slight pressure changes may have on fluid secretion is not now known.

Any less stringent criteria for evaluating spinal headache would allow the individual's pain threshold to alter results. If the patient's inability to sit up or become ambulatory is selected as the lower limit of a headache, then the stoicism of the patient would certainly alter the percentages. We determined whether a patient had a headache or not. We made no attempt to judge the severity of the headache, although it was our impression that the discomfort of these 5 patients was less severe and of shorter duration than that of the patients tapped with a 15 gauge needle.

We are sure that the incidence of headache would have been much higher if we had included patients with more than one hole in the dura. The greater the number of dural punctures, the greater the likelihood of fluid leakage.

It is interesting to note that 3 of the 5 patients complaining of head discomfort reported previous migraine or frontal headaches. This is consistent with other observations that migraine sufferers are more likely to have spinal headache.

SUMMARY

A technic of subarachnoid puncture using a 27 gauge spinal needle is described.

The incidence of spinal headache was found to be reduced to 5 per cent in a series of 100 anesthetic cases when one dural puncture was made with a 27 gauge spinal needle.

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