A New Needle for Controlled Spinal Drainage

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The evacuation of cerebrospinal fluid from the basal cisterns by means of spinal drainage is an important technical contribution facilitating neurosurgical operative exposures. This is vital when approaching aneurysms of the circle of Willis and in the surgical manage-

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Prior to the development of the present needle, disappointing results had followed the use of the single aperture malleable spinal needle and the indwelling plastic or ureteral type of catheter because accurate placement could not be maintained and the lumen tended to become obstructed. The risk of breaking a catheter in situ could not be ignored. Drainage proved to be sporadic and the results were unsatisfactory to the point where mechanical drainage with its manifest advantages was gradually replaced by the use of hypertonic solutions to achieve a similar, more reliable effect.

The answer to the problem appeared to lie in the design of a needle which would eliminate the deficiencies of present equipment. This was achieved by utilizing a sturdy 17 gauge needle with a solid, sharp diamond-shaped tip capable of penetrating the skin, interspinous ligaments and arachnoid without difficulty. Four perforations in the shaft of the needle, the first two located 3 mm. proximal to the tip and the second two 5 mm. from the tip, provide for a brisk flow of fluid and allow a margin of safety against possible blockage of one or another of the openings by nerve roots or arachnoid. The needle (fig. 1) is made in three lengths, 5, 6, and 7 cm. The length of the needle selected depends on the estimated depth of the vertebral canal from the skin surface. Although usually unnecessary, this may be determined from true lateral lumbar spine roentgenograms. The 6 cm. needle is suitable for most patients. Inasmuch as the four openings are only 2 mm. apart and the depth of the subarachnoid space is between 1.2 and 1.8 cm., sufficient leeway exists for the needle to be inserted to its full length. When placed properly, the hub lies flush with the skin of the back in the hollow of the interspinous ligament and is directed at a right angle to the longitudinal axis of the body where it is securely held by the ligaments. The hub accepts an appropriate venotube (Abbott) or other suitable plastic drainage tubing, thereby eliminating the need for a split mattress to protect the terminal portion of the needle and adapter.

Rapid drainage of fluid occurs as the needle enters the subarachnoid space. Attaching the venotube prior to insertion and positioning of the needle has minimized this initial escape of fluid and permits controlled drainage to a selected reservoir. When good drainage is observed a strip of adhesive tape across the proximal portion of the venotube also serves to stabilize the needle. A sterile pad is all that is needed to cover the hub and adapter. This may be built up slightly to adjust for variations in depth of insertion if required.

The present method of spinal drainage is reliable, simple and has presented no complications in 25 cases. No evidence of infection has been encountered, the instrument having been left in situ for as long as six hours. While not employed for prolonged spinal anesthesia, it may be adapted for this purpose.

The needles were provided by Becton, Dickinson and Company, Rutherford, New Jersey.