

is an excellent linear relationship between these two variables, demonstrating that the rate of decline of (or recovery from) the neuromuscular blocking effect of gallamine is controlled by the rate at which gallamine plasma concentration declines during a particular effect range. This relationship reflects the progressively changing contribution of drug distribution and elimination, respectively, to the decline of gallamine effect as relaxant dosage is increased. When the dose is small, peak plasma concentration is low (as is the peak paralysis produced), and decline below the threshold concentration for neuromuscular blockade occurs during the distributive phase. The decline of effect is thus more rapid. As the dose of gallamine is increased, higher gallamine concentrations are reached in plasma and the decline to threshold concentration occurs during the slower elimination phase. Hence, the rate of recovery from paralysis is lower.

The approach presented here to explain the dose-dependent decline in the pharmacologic effect of gallamine is not new. In fact, the theory underlying the present explanation was proposed more than a decade ago and utilized to explain the dose-dependent decline in the neuromuscular blocking effect of the classical skeletal muscle relaxant drug *d*-tubocurarine.³ More

recently an analogous explanation has been proposed for the dose-dependent duration of action of intravenous anesthetic fentanyl.⁴ The explanation for gallamine presented here is possible, since both pharmacodynamic and pharmacokinetic data are now available for gallamine.

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REFERENCES

1. Walts LF, Dillon JB: Durations of action of *d*-tubocurarine and gallamine. *ANESTHESIOLOGY* 29:499-504, 1968
2. Ramzan IM, Triggs EJ, Shanks CA: Pharmacokinetic studies in man with gallamine triethiodide I. Single and multiple clinical doses. *Eur J Clin Pharmacol* 17:135-143, 1980
3. Gibaldi M, Levy G: Dose-dependent decline of pharmacologic effects of drugs with linear pharmacokinetic characteristics. *J Pharm Sci* 61:567-569, 1972
4. Murphy MR, Olson WA, Hug Jr CC: Pharmacokinetics of ³H-fentanyl in the dog anesthetized with enflurane. *ANESTHESIOLOGY* 50:13-19, 1979

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Reduction of Postlumbar Puncture Backache by the Use of Field Block Anesthesia prior to Lumbar Puncture

To The Editor:—Backache is a common postoperative complaint following any type of anesthesia. The incidence of immediate postoperative localized backache is 2-31%.^{1,2} It is usually characterized by marked tenderness of the lumbar spinous area. The etiology of backache associated with lumbar puncture is due to localized trauma, which leads to aseptic periosteitis, tendonitis, inflammation of the ligaments, and osteochondritis. Among these patients, about 3% of cases might suffer backache for prolonged periods (table 1). One way of preventing this complication is by the use of field block anesthesia as described by Wilkinson.³ We would like to present a series of cases in which there was no prolonged localized backache, since the inception of this new technique in May 1983 (table 1). This is in comparison to the 2.73% incidence of chronic backache in our own previous series of 2,046 lumbar punctures in the last 5 years ($P < 0.001$). There were eight spinal anesthetics and 256 epidural anesthetics performed on obstetric patients, and 58 epidural anesthetics on surgical patients preceded by the "field block" technique since May 1983. Prior to this, only infiltration anesthesia of the

skin and ligaments were performed for the insertion of the needle.

The method of field block as originally described by Wilkinson³ was modified slightly as follows:

A skin wheal is raised over the site of puncture with a 25-gauge needle, with the use of 0.2 ml of 0.5% bupivacaine. A 3.8 cm needle is used to deposit 1.0 ml of 0.5% bupivacaine bilaterally into the interspinous space near the lamina. This method is able to fully anesthetize the recurrent spinal nerves, which innervate the interspinous ligaments and muscles (see fig. 1).

TABLE 1. Comparison of Incidence of Transient and Prolonged Localized Backache in Two Groups of Patients

	Without Spinal Nerve Block	With Spinal Nerve Block	P
Number of cases	2,046	322	
Transient backache (less than 3 days)	286 (13.97%)	18 (5.59%)	<0.05
Prolonged backache (over 3 months)	56 (2.78%)	0 (0%)	<0.001

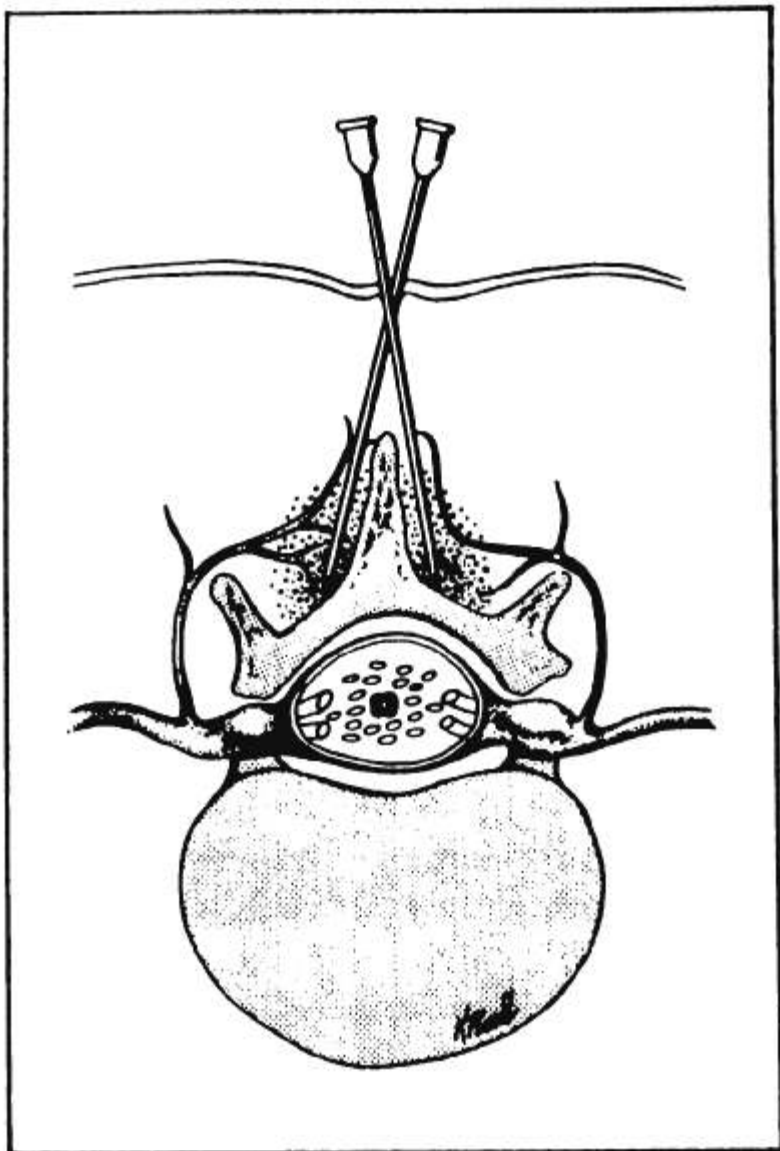


FIG. 1. Anesthetization of recurrent spinal nerves.

The use of field block anesthesia practically eliminates the incidence of prolonged regional postlumbar puncture backache. We also found that most patients did not experience pain or discomfort during the placement of either the epidural or spinal needle. This is in contrast to the conventional infiltration technique, where many patients experience pain during needle insertion and are also less cooperative.

Possibly, the reason for this decrease in postoperative backache may be due to profound and prolonged regional sympathetic and sensory blockade. This sympathetic blockade leads to local vasodilation, which promotes tissue healing from needle injury.

In conclusion, we highly recommend the routine use of the field block technique prior to lumbar puncture, especially for epidural anesthesia. The technique is simple and highly successful with negligible complications and also makes for a more cooperative patient.

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REFERENCES

1. Bromage PR: Epidural Analgesia. Philadelphia, WB Saunders, 1978, p 661
2. Usubiaga JE: Neurological complications following epidural anesthesia. *Int Anesthesiol Clin* 13:45-46, 1975
3. Wilkinson HA: Field block anesthesia for lumbar puncture. *JAMA* 249:2177, 1983

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