TITLE: INTERSCALENE BRACHIAL PLEXUS BLOCK FOR SHOULDER SURGERY: SIGNIFICANCE OF PARESTHESIA SITE

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The interscalene brachial plexus block is a widely used anesthetic technique for surgery of the shoulder. We have observed that when this block is performed the earliest elicited paresthesia is often to the shoulder. It has been recommended that shoulder paresthesias not be used and that further needle probing be carried out until an elbow or thumb paresthesia is achieved[1]. This study was designed to evaluate the relative effectiveness of shoulder versus more distal paresthesias.

After institutional approval we prospectively studied 45 unpremedicated patients (ages 17-79 yrs.) presenting for shoulder surgery. Interscalene blocks were performed at the level of C6 using a paresthesia technique. At the first elicited paresthesia patients received a standardized dose bicarbonated mepivacaine (10 mg/kg) with epinephrine (1:300,000). Paresthesias were classified as shoulder, arm, or hand. Neural blockade was assessed by measuring the time until the patient was unable to elevate the upper arm at the shoulder and flex the forearm at the elbow. In addition, handgrip strength using a JAMAR dynamometer was determined for 16 minutes in all patients. Data were analyzed using ANOVA and two-tailed t-tests.

Paresthesias were observed to the shoulder in 20 (45%), arm in 19 (42%), and hand in 6 (13%). All patients developed surgical anesthesia. The site of paresthesia did not influence the rate of onset of motor blockade measured at the shoulder or elbow (Fig.1) nor with handgrip (Fig.2). Furthermore, neither age, height, weight, or sex influenced the onset of motor blockade.

We conclude that:(1) Shoulder as well as more distal paresthesias may be used to achieve satisfactory anesthesia for shoulder surgery. (2) There does not appear to be a significant difference in latency of motor blockade with different paresthesia sites. (3) When a standardized dose of mepivacaine is administered based on patient weight there is no significant effect of age, height, or sex on the latency of motor blockade following interscalene block.

References: 1. Practical Management of Pain, Raj, p.609,Year Book Medical Publishers,1986.

FIGURE 1

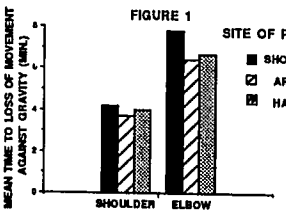
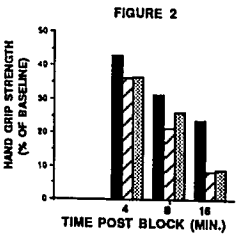


FIGURE 2



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TITLE: THE RELATIONSHIP OF RETROBULBAR LOCAL ANESTHETIC SPREAD TO THE NEURAL MEMBRANES OF THE EYEBALL, OPTIC NERVE AND ARACHNOID VILLI IN THE OPTIC NERVE

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Introduction: There are numerous complications reported after retrobulbar block such as: hematoma, blindness, disorientation, respiratory arrest, unconsciousness, convulsions, cardiac arrest, death, blindness, and amaurosis in the contralateral eye (1,2). This study reveals the possible mechanism and routes of spread of local anesthetics (LA) causing these complications.
Material Studied: The eyes of the rat, rabbit, Rhesus monkey and human are used in this study. Serial isolation of choroid and the pia-arachnoid of the optic nerve and optic chiasma was done using microsurgical instruments under the dissection microscope. Standard histological staining was done on longitudinal sections of the eye, optic nerve, choroid and pia-arachnoid membranes (3).
Results: Serial isolation studies show that the choroid of the eyeball continues as pia-arachnoid mater of the optic nerve, optic chiasma and to the opposite optic nerve. The subarachnoid space (SAS) of the optic nerve communicates with the chiasmal and interpeduncular cistern, and the SAS of the opposite optic nerve (Fig. 1). The optic nerve in man and monkey have the arachnoid villi (Fig. 2) which breach the thickness of optic nerve dura.
Discussion: The LA in the retrobulbar space can be absorbed by these arachnoid villi in the optic nerve and transmitted to the SAS of the optic nerve. The LA can also be injected directly into the SAS. The LA from the SAS of the optic nerve can spread to chiasmal cistern, to the opposite optic nerve, interpeduncular cistern, and medullary centers resulting in these complications.

References:
1. Arch. Ophthalmol. 96:8347, 1978.
2. Ann. Ophthal. 14:1005, 1982.
3. Exp. Eye Res. 3:31-35, 1964.