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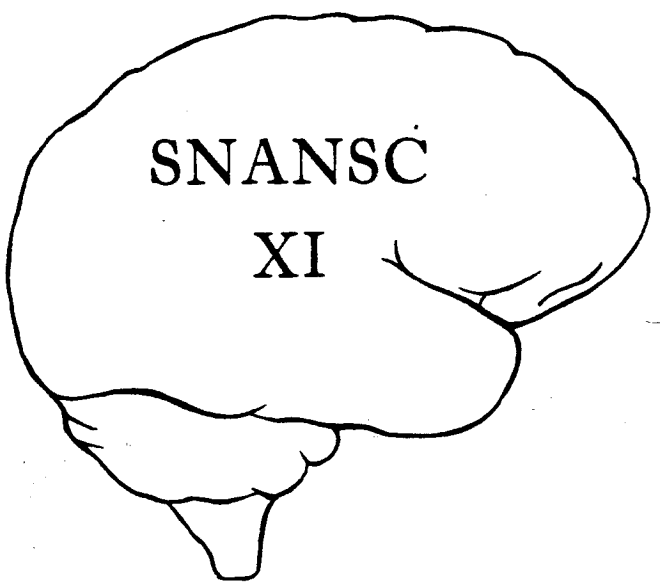

Lecture Summaries and Abstracts
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WORKS IN PROGRESS

CERVICAL CORD TRANSECTION CHALLENGES BRAIN:ICP, BRAIN WATER, BLOOD BRAIN BARRIER PERMEABILITY AND CBF CHANGES*+

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The early physiological responses to accute cervical cord transection in man may involve changes in the cardiovascular and pulmonary systems.[2] Venous capacitance, arterial tension, heart rate, the ECG and changes in pulmonary compliance have all been reported in acute quadriplegia.[2,27] Transitory arterial hypertensive reactions occuring immediately after experimental cervical cord injury with high mean blood pressures have been described by a number of investigators in the past.[1,3,4,5,11,12,22,23,24,25,28]

It has also been noted that acute rises in mean arterial blood pressure may provoke changes in blood brain barrier permeability in experimental animals and the subsequent development of cerebral edema.

The purpose of these experiments are to delineate any changes in intracranial dynamics that might occur after transection at the C_4 vertebral level.

MATERIAL AND METHODS

In all these experiments acclimated mongrel canines between 18 and 24 kg were used, anesthetized with pentobarbital, intubated and their ventilation controlled to normoxia and normocarbia. They were divided into the following experimental categories.

Group I - Cardiovascular Dynamics and Intracranial Pressure

A. After intubation and blood gas stabilization appropriate catheters and instrumentation was used to monitor ECG, femoral artery pressure and cisterna magna intracranial pressure in 26 animals. In 12 of these animals a triple lumen

Swan-Ganz catheter was inserted for measurements of CVP, PAP, PCWP and CO. A laminectomy was performed at the C_4 vertebral level, a ligature placed about the cord and transection accomplished by simultaneously lifting the cord with the ligature and crushing the cord between the jaws of a Kelly clamp.

B. In this series of 14 animals, 2.0 mg/kg of phentolamine mesylate, an alpha adrenergic blocker was administered 30 minutes prior to spinal cord transection. The same parameters were monitored as in A above including insertion of a Swan-Ganz catheter in all 14 animals.

Group 2. Blood brain barrier permeability. 0.5 ml/kg Evans blue was injected intravenously in:

A. Seven (7) animals who were monitored but did not have a laminectomy. The injection took place one hour after instrumentation and sacrificed with an overdose of KCL.

B. Seven (7) animals had laminectomy only with the Evans blue injected one hour later and then sacrificed.

C. Seven (7) animals had their cords transected at C_4, the dye injected one hour later and then sacrificed.

D. Five (5) animals were pretreated with phentolamine mesylate and 90 minutes later were given Evans blue and then sacrificed.

E. Seven (7) animals were pretreated with phentolamine mesylate, cords transected 30 minutes later and 1 hour after were given the dye and then sacrificed.

F. Five (5) animals had Evans blue injected two hours after cervical cord transection and then sacrificed.