

NEURONAL DEATH AND GLIAL REACTION IN CENTRAL NERVOUS SYSTEM FOLLOWING LASER RADIATION.

B. González, B. Castellano and G. Palacios. Dept. Biología Celular y Fisiología. Universidad Autónoma de Barcelona. Spain.

Although laser devices are gradually introduced into clinical practice of neurosurgery, very little is still known about the effects generated in nervous tissue by this type of radiation. The aim of the present work was to study at electron microscopic level the changes occurred in nervous tissue adjacent to walls of laser-induced wounds.

The brains of forty adult quails were exposed to a focused Argon laser beam. Power densities were carefully selected in order to obtain accurated vaporized lesions and prevent heat diffusion. After different survival times, animals were fixed by intracardiac perfusion, brains removed, and tissue slices containing lesioned areas were processed for electron microscopy.

Our observations show the presence of an edematous zone surrounding vaporized area in which a sequence of ultrastructural changes lead to the disintegration of tissue. Edematous zone increase during the first 48 hours following laser impact and their final extension is closely related to blood vessel degeneration. Neurons located in this edematous zone are early damaged, showing cellular changes until death, while astrocytes show a significant hypertrophy. A scarce reaction of microglia can be observed.

Since experimental method avoids diffusion of heat, we assume that neuronal death and astroglial reaction can be caused by the degeneration of blood vessels.