A SUCTION CHAMBER (PK-2) FOR LEADING OFF NERVE POTENTIALS

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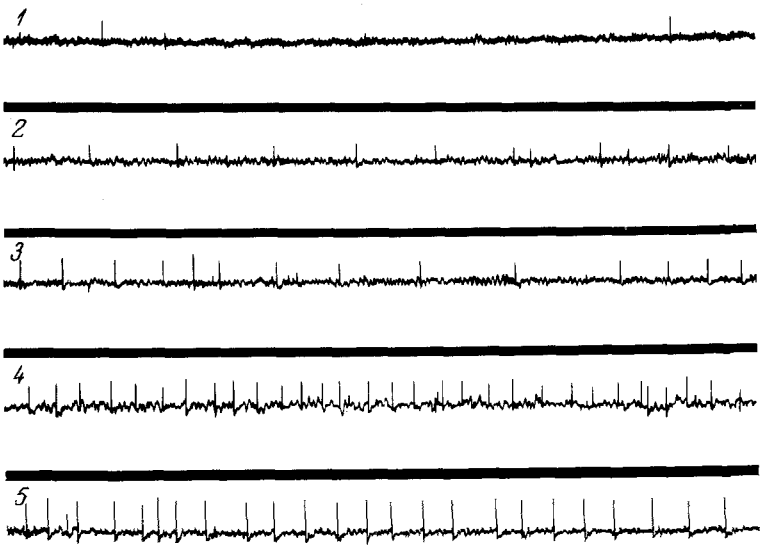
Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 57, No. 4, pp. 138, 139, April, 1964
Original article submitted April 6, 1963

A nerve must be prevented from drying up when potentials are to be recorded from it. In work with isolated organs, various designs of moist chamber have been employed for this purpose, or else the nerve has been placed in a small vessel with vaseline. The use of an intact animal greatly complicates these arrangements. The PK-2 chamber which we describe here enables a nerve to be protected from drying up for a long time, and eliminates any shift of the nerve with respect to the electrode during movements.



Oscillograms of the cutaneous branch of an intercostal nerve of a rabbit. 1) Initial condition; 2 and 3) 40 and 55 min after the start of the experiment; 4 and 5) 56 and 60 min after the action of a 1% solution of potassium chloride applied to the receptors of the external thoracic vein. Rate of movement of film 250 mm/sec. Time marker 50 milliseconds.

To prepare the chamber a 6 mm length is cut from a perspex tube having external and internal diameters of 16and 12 mm. In the lower end a gutter 1.5 mm wide and 3 mm deep is cut. Through its outer wall this circular groove is connected by a 1 mm vinyl tube to a rubber bulb, the connection being hermetically sealed with BF adhesive. Two or four silver electrodes connected to a flexible lead are attached 1 mm below the upper face.

The rubber bulb is emptied of air, and then when the nerve has been exposed the chamber is placed in the region where the nerve leaves the tissue, and is arranged so that the nerves are within it. The bulb is then released. Because of the vacuum in the gutter the chamber becomes firmly fixed to the tissues. The nerves are placed on the

electrodes. The chamber is filled with fluid vaseline which protects the nerve from drying up. The PK-2 may be used also as a moist chamber. In this case the upper face is smeared with thick vaseline and then closed with a cover slip.

In our own experiments we have used the PK-2 as either a moist chamber, or as one filled with grease. The results obtained have been satisfactory (see figure). Both arrangements enable the nerve to be preserved for several hours. Its dimensions may readily be adjusted to the conditions and aim of the experiment. In our opinion the chief advantage of the chamber is that during movements of the animal the nerve remains fixed with respect to the electrode, because the chamber moves together with the animal.

During this experiment the nerve was neither moistened nor covered. Nervous function was well maintained. The experiment was stopped after it had been successfully completed.

SUMMARY

A suction chamber (PK-2) suitable for recording nerve action potentials is described. It protects the nerve from drying up and eliminates the possibility of it becoming displaced from the electrodes by movements of the animal.