




Human choroid plexus in a patient with intracranial hypertension and hydrocephalus: scanning electron microscopy

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Introduction

The daily production of 500 ml of cerebral spinal fluid (CSF) is largely carried out by the choroid plexus (CP), which is located in the cerebral ventricles. In recent years, much importance has been given to studies of the choroid plexus for a better understanding of the mechanism of headache associated with idiopathic intracranial hypertension or other etiologies. A few drugs acting on the CP to reduce CSF secretion are used to treat headache in patients with benign intracranial hypertension.

Objectives

To show scanning electron microscopy images of CP obtained from pediatric patients with hydrocephalus.

Method

The CP sample was collected during a surgical procedure of a third ventriculostomy and CP coagulation as a treatment for hydrocephalus in a 2-year-old boy. A sample of uncoagulated CP (5 mm) was removed and immediately immersed in glutaraldehyde solution and refrigerated at 4°C. In the electron microscopy laboratory of UFPE, the sample was studied. The CP was fixed with Karnovsky solution (2.5% glutaraldehyde, 4.0% formaldehyde and 0.1M sodium cacodylate buffer), later postfixated with 1% osmium tetroxide, dehydrated in an increasing series of alcohol (30%, 50%, 70%, 90% and 100%) and carried out the critical point for total drying. The samples were placed in metallic stubs containing a double-sided carbon tape and then metalized with gold-palladium in the Ion Sputter JFC-1100 (JEOL) equipment. Images were performed using the EVO LS-15 scanning microscopy (ZEISS).

Results

We present images of CP segments at 20,000 to 40,000x magnification, showing surface projections suggesting microvilli. Due to ethical issues, we do not have a control sample of healthy individuals for comparative purposes.

Conclusion

To the best of our knowledge, this is the first time human CP images of a patient with hydrocephalus are presented using scanning electron microscopy.

Keywords: Choroid plexus, Headache, Intracranial hypertension, Hydrocephalus, Microscopy.