

New Cannula For Brain Delivery Drugs, Experience With Oncolytic Virus Infusion For DIPG.

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Purpose:

Drugs infusion in the brain needs special cannulas to ensure proper delivery and to avoid back flow.

Oncolytic viruses are an emerging new treatment for brain tumors that must be injected into the tumor to be effective.

Alcyone MEMS cannula (AMC) has been designed to provide a precise convection-enhanced delivery directly to a neurological target. It has two lumens that can be used to infuse two different drugs at the same time.

Material and methods:

A phase I clinical trial for pediatric DIPG with an oncolytic adenovirus, DNX-2401, uses the AMC to inject the virus directly into the pons.

Gadolinium (Gd) was infused through the second channel. Procedure overview was as follow: Dilution of the Gd (Magnevist) with saline to 5-10mM, insertion of the AMC on a planned trajectory. Infusion of 150uL of Gd. Then infusion of 1mL of the DNX-2401. Removal of AMC and performance of a magnetic resonance (MRI).

Results:

4 patients have been treated following this clinical protocol. MRI following Gd and virus infusion showed a ring of contrast in the planned target in all the patients with no back flow. A Gd concentration of 5mM was infused in the first patient, with a slight signal in T1 3D sequences, so it was increased to 10mM for the next patients, with a more intense signal. No complications have been registered.

Conclusion:

The AMC is a useful device for drug delivery into the brain, which can be used to infuse one or two drugs, avoiding back flow.