

# Strong Cytotoxic Reaction in Malignant Glioma Tissue After Locoregional Cisplatin Administration by Microdialysis

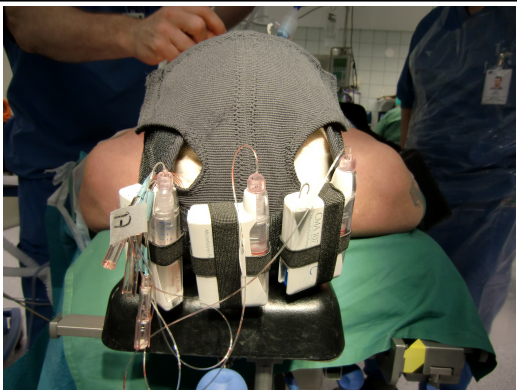
Pedram Tabatabaei Shafiei MD; Mikael Johansson M.D, PhD; Per Bergström MD, PhD; Thomas Asklund M.D, PhD; Tommy A. Bergenheim MD, PhD

## Introduction

Microdialysis is based on sampling of molecules from the interstitial compartment of tissues by means of semipermeable membrane at the tip of a microdialysis probe. This technique may also be used for delivery of drugs – retrograde microdialysis. We have used microdialysis to administrate Cisplatin locally in malignant gliomas and at the same time monitor metabolic events.

## Methods

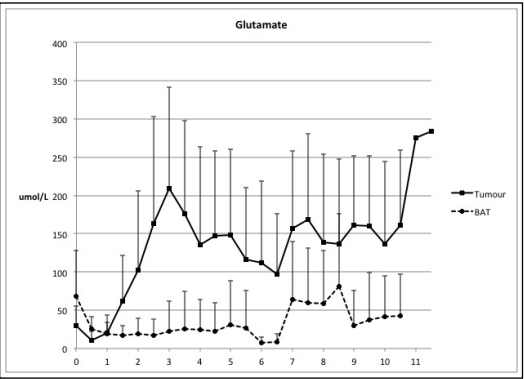
Ten patients with recurrent malignant gliomas in whom conventional treatment was unsuccessful were treated with intratumoral Cisplatin for up to 12 days. One to three microdialysis catheters for treatment were stereotactically introduced into tumour tissue and one reference catheter in brain-adjacent-to-tumour (BAT). Following overnight recovery, treatment was started with a perfusate containing cisplatin, 0.5–1.0 mg/mL. The study was dose-escalating with initially 1 mg/day. Glucose energy metabolites and glutamate were monitored. The patients were fully mobilised the day after surgery with the apparatus attached to a head cloth. If clinical signs of adverse effects, steroids were given and treatment was withheld until recovery. Blood samples were taken to evaluate



## Results

Glutamate levels in tumour tissue increased significantly within 24 hours following the start of treatment and increased further during treatment. In BAT, glutamate was unchanged by treatment. The energy metabolites glucose, lactate and puruvate were not affected in tumour nor in BAT.

No complications such as infection or haemorrhage occured. In all patients an increased cerebral oedema was found and in 6 patients the treatment was withheld for a few days or terminated in advance, and steroids were given. All patients recovered within a few days. No systemic side effects were noted.



## Conclusions

Microdialysis is a feasible method for delivering drug and at the same time monitor metabolic events in malignant glioma. We found a strong cytotoxic effect in tumour tissue as assessed by glutamate following local treatment with Cisplatin.

## Learning Objectives

By the conclusion of this session, participants should have an understanding that locoregional treatment with Cisplatin by retrograde microdialysis is possible and may result in a strong cytotoxic reaction in malignant gliomas.