

# Active CSF Exchange System is for IVH Treatment

## Active Removal of Cerebral Haemorrhage

Behnam Rezai Jahromi, MD, Nicholas Brandmeir, MD, Felix Göhre, MD, PhD, Jussi Numminen, MD, PhD, Päivi Tanskanen, MD, Mika Niemelä, MD, PhD, Jari Siironen, MD, PhD



EANS2022  
Belgrade

## INTRODUCTION

- Intracerebral haemorrhage (ICH) associated with intraventricular hematoma (IVH) has higher rates of morbidity and mortality.
- Removal of IVH depends on passive external ventricular drainage, which is time consuming and gives opportunity to IVH re-organize and have negative effect on neural tissue.

## OBJECTIVES

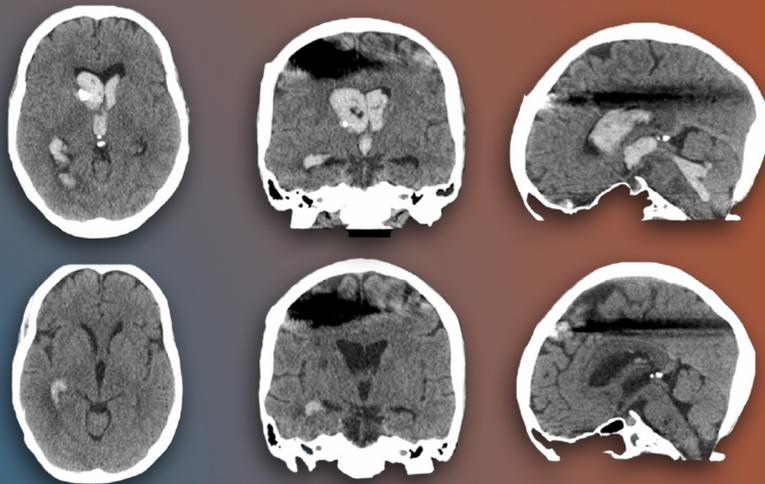
- Expedient removal of ICH and IVH should result in less organization of blood in the cerebrospinal fluid thus minimizing neural toxicity and facilitating better neurologic outcomes for patient and reduction in ICU time.
- We tested a novel fluid exchange system (active EVD) with controlled tPA infusion on 5 ICH and IVH cases to determine if rapid removal of blood could occur.

## METHODS

- In 2 cases, 2mg of tPA was administered manually over 2 consecutive days. In the other 3 cases, 2mg of tPA in 1,000 cc's of fluid was continuously infused over a period of 2 consecutive days.

## RESULTS

- In all 5 cases, CT demonstrated 90% removal of blood occurring in 72 hours or less.
- Further, in all cases, complete treatment with the device, from catheter insertion to removal, was completed in an average of 5 days.
- Figure 1 and 2 demonstrates removal of IVH in 47h with 2,4mg tpa.



## CONCLUSIONS

- Active removal of IVH with infusion of tPA and fluid exchange significantly increases the removal of blood and reduces treatment times compared to standard EVD treatment.
- Further, our case series substantiated a significant reduction in ICH.
- For this reason, we need future studies to assess the impact of tPA administration in ICH with active fluid exchange on neurological outcomes, ICU treatment time and need of standard EVD treatment.