

# Hemoadsorption with Cytosorb and mechanical circulatory support in a pediatric patient after congenital heart surgery: a clinical case report

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## Background

CytoSorb<sup>®</sup> is an hemoadsorption device capable of removing molecules weighing between 10 and 55 kDa including troponin (TnI), myoglobin (Mb), creatine kinase (CK) and inflammatory cytokines. It can be used alongside CRRT (continuous renal replacement therapy) or other emofiltration techniques. The use of CytoSorb<sup>®</sup> is labelled in patients weighing more than 10 Kg but is not contraindicated in children under that weight.

## Case Report

We report a case of an 8-months-old child weighing 7Kg with Di George syndrome and ToF that underwent surgical correction. The operation was performed without any surgical or anesthesiologic complication and the patient was extubated after the surgical procedure with minimal inotropic support. The day after surgery the patient presented severe tachyarrhythmias with hemodynamic instability and lab tests consistent with massive rhabdomyolysis leading to heart and renal failure. After few noninvasive trials, central venous and arterial cannulas was placed and VA-ECMO started; alongside with ECMO, CRRT was started for renal failure and anuria. After 48 hours the clinical state of the patient was severe with high ECMO support and rising CK (108473 U/L), Mb (>38620 ng/ml) and TnI (>265480 ng/L). Because of the extreme severity of the case, we decided to try the use of CytoSorb<sup>®</sup> even if the weight of the patient was under 10Kg.

## Results

After 12 hours of CytoSorb<sup>®</sup>-CRRT we reported a significant drop of the rhabdomyolysis indices, report in Table 1. The treatment was discontinued after 12 hours following a worsening of already existing thrombocytopenia (Table.1) without any major bleeding. Despite the interruption of the treatment the beneficial effect of the therapy was stable 12 and 24 hours after (Table.1). VA-ECMO was discontinued after 7 days and CRRT after 20 days with a good heart and renal function. The patient was transferred in the semi-intensive care unit 25 days after the surgery. No cause of rhabdomyolysis was identified even with genetical and metabolic research.

Lab Value	Pre CytoSorb <sup>®</sup>	12h	12h stop	24h stop
Platelets (*10 <sup>9</sup> )	62	6	50	39
PT-INR	1,74	2,25	1,41	1,23
PT ratio	1,7	2,18	1,39	1,2
PTT ratio	1,4	8,08	2,37	2,01
Myoglobin (ng/ml)	>3862	4510	4613	4528
Troponin I	>265480	24184	69478	76493
Creatin Kinase	108473	82889	74621	63815

**Table 1:** 12h: 12 hours after the beginning of the treatment; 12h stop: 12 hours after discontinuing CytoSorb<sup>®</sup>; 24h stop: hours after discontinuing CytoSorb<sup>®</sup>)

## Conclusion

In this case we highlight the persistent efficacy of CytoSorb<sup>®</sup> in clearing rhabdomyolysis products that could lead to an improvement of organ function in a child under 10 Kg. We also recommend caution since the important impact on the coagulative state of the patient.