

## Hemoperfusion with cytosorb for bilirubin and cytokine removal in a cardiac surgery patient.

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### Background

Removal of bilirubin through extracorporeal blood purification is an increasingly common technique that supports hepatic detoxification function, especially in critical patients. In this context, the CytoSorb cartridge is able to adsorb cytokines, bilirubin, bile acids and a huge spectrum of other molecules involved in liver dysfunction, aiming to support traditional therapies and facilitate patient's recovery.

### Methods

This case reports on a 62-year-old female patient who was admitted to our Cardiac Intensive Care Unit after mitral valve replacement. History highlights mitral valve annuloplasty in 2010, high blood pressure, atrial fibrillation treated with anticoagulant therapy, obstructive sleep apnoea syndrome, obesity and bronchiectasis. After surgery, high fever, leucocytosis and hemodynamic instability showed, so antibiotic and vasoactive therapies were started. Blood culture resulted negative, but Broncho-alveolar Lavage was positive to *Pseudomonas aeruginosa*, therefore antibiotic therapy was changed into Linezolid, Cefepime and Ciprofloxacin. During the first month in our ICU, two episodes of hemorrhagic shock occurred and were solved thanks to traditional therapy. Furthermore, atrial fibrillation with rapid ventricular response was treated with electrical cardioversion a few times. Four days later fever persisted and sepsis markers were high: septic shock was diagnosed. Renal replacement therapy (CVVHDF) was performed days later because of acute renal failure. Additionally, laboratory investigations revealed an impaired liver function accompanied by hyperbilirubinemia (15mg/dl) and increased hepatic markers. Serological tests for hepatitis virus showed the patient was infected with the HAV, so Caspofungin was added to the ongoing drug therapy. Subsequently, the decision was made to use the CytoSorb hemoadsorption cartridge in hemoperfusion mode with Plasmapher Apherlungs machine.

### Results

The therapy lasted 24 hours and, after that, bilirubin and LDH values decreased from 16,11 to 12mg/dl and from 502 to 400U/L, respectively. Days later bilirubin levels dropped progressively (6,38mg/dl) and LDH levels stabilized, until both of them reached their physiological ranges. The patient's general condition improved impressively and weaning from mechanical ventilation and inotropic drug therapy was made. After 104 days in our ICU, the patient was finally discharged. In this case describing the use of CytoSorb in hemoperfusion mode in a patient suffering from an overshooting inflammatory response and liver dysfunction, treatment was associated with improvement in hemodynamic, inflammatory status as well as liver function. The setup was technically feasible and the treatment was performed without any complication. Further studies are needed in order to investigate on bilirubin and cytokine removal in such critical patients.



**Figure 1.** CytoSorb cartridge at the end of the treatment.