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Case of the week 48/2019

Use of CytoSorb in a patient with emergency thigh amputation after femoral artery occlusion

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This case reports on a 59-year-old male patient (known medical history: nicotine and alcohol abuse, depression), who was transferred to the hospital via the emergency ambulance after he was found at home neglected and confused.

Case presentation

- According to the emergency services, the patient was found completely listless in his bed and did not react appropriately to speech
- Immediate transfer of the patient to the intensive care unit with reduced vigilance and disorientation as well as pronounced hypothermia (30.0°C), severe hypovolemia and tachycardia
- In order to exclude an intracerebral insult, a CT examination of the brain was performed as he was still confused, however without any clinical findings
- Due to pre-existing arteriosclerosis, a whole body CT diagnostics revealed thrombotic occlusion of the right leg arteries including the femoralis bifurcation, Arteria tibialis posterior, Arteria dorsalis pedis, Arteria fibularis, Arteria poplitea and Arteria femoralis superficialis right resulting in ischemia of the right leg
- Findings of the CT from the pelvic bone region were discussed with the vascular surgery department resulting in the indication for surgical intervention
- The subsequent procedure included an extensive thrombo-endarterectomy and embolectomy with subsequent patch plastic surgery, digital subtraction angiography of the pelvis and right leg arteries as well as splitting of all compartments of the lower leg
- Postoperatively, the patient was transferred to the intensive care unit intubated, ventilated and with profound hemodynamic instability
- In order to maintain sufficient circulation, high doses of noradrenaline were necessary. There were no respiratory abnormalities
- Calculated antibiotic therapy was initiated with ampicillin/sulbactam
- Additionally, active warming was started due to a low body temperature accompanied by the initiation of cortisone therapy
- As the pulse was partially not measurable via doppler sonography at various locations in the thigh and due to simultaneous deterioration of blood circulation in the right leg, the surgical department was informed and a thigh amputation was performed the next day
- Following the procedure, the patient again exhibited extreme hemodynamic instability (norepinephrine 42 µg/min, dobutamine 100 µg/min)
- Laboratory diagnostics further revealed severe rhabdomyolysis syndrome accompanied by increasing plasma levels of retention parameters resulting in the initiation of continuous renal replacement therapy (CRRT) for the treatment of acute renal failure
- With the rationale to stabilize hemodynamics and to lower myoglobin, a CytoSorb adsorber was additionally integrated into the CRRT circuit 16 hours after the start of CRRT

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Treatment

- One treatment session with CytoSorb for 24 hours
- CytoSorb was used in combination with CRRT (Prismaflex, Baxter) run in CVVHDF mode
- Blood flow rate: 100-120 ml/min
- Anticoagulation: citrate
- CytoSorb adsorber position: post-hemofilter

Measurements

- Hemodynamics and catecholamine demand
- Inflammatory parameters
- Parameters of rhabdomyolysis (CK, myoglobin)
- Renal function

Results

- During the following 24 hours of treatment, his hemodynamic situation stabilized significantly with concomitant reduction in vasoactive therapy (norepinephrine from 42 to 20 µg/min after 15 hours and 8 µg/min at the end of therapy, dobutamine from 100 µg/min to 50 µg/min shortly after completion of CytoSorb therapy). Both, norepinephrine and dobutamine could be completely ceased 24 hours after discontinuation of CytoSorb treatment
- During treatment, clear control of the hyperinflammatory condition could be achieved as evidenced by a decrease in CRP levels from 12.3 mg/dl to 1.62 mg/dl
- Significant reduction of myoglobin during CytoSorb hemoadsorption treatment from an initial 11,197 ng/ml to 215 ng/ml. CK also decreased from 11,888 U/l to 3052 U/l after 20 hours and to 1548 U/l at the end of the treatment. Three days after discontinuation of treatment, myoglobin levels were 87 µg/l and CK was 427 U/l
- With the combined use of CRRT and CytoSorb, stable diuresis could be achieved (urinary output 1900 ml/24h before the start of treatment, 2800 ml/24h after treatment followed by progressively increasing diuresis)

Patient Follow-Up

- Discontinuation of CVVH together with CytoSorb therapy
- Antibiotic therapy was terminated in the context of decreasing inflammatory parameters and negative microbiological results
- Complication-free extubation 24 hours after the end of CytoSorb
- From then on, during his stay in intensive care the patient was alert, fully oriented and cooperative, with appropriate enteral nutrition, and hemodynamically stable at all times
- At the time of documentation, the patient is still in intensive care awaiting transfer to the normal ward

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Conclusions

- In this patient with emergency thigh amputation after femoral artery occlusion, the combined treatment of standard therapy, CRRT and CytoSorb resulted in a significant improvement in hemodynamics, control of the inflammatory response and a significant reduction in myoglobin while maintaining good renal function
- According to the medical team, CytoSorb was used at the ideal time point given the extremely critical situation, and may have contributed significantly to the survival of the patient
- CytoSorb was safe and easy to apply in combination with CRRT