

Cytosorb Hemoadsorption for Dabigatran Removal in Emergency Mitral Valve Surgery: A Case Report

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Introduction

Dabigatran, a direct thrombin inhibitor, is commonly used for stroke prevention in patients with atrial fibrillation. However, its anticoagulant effects pose a significant challenge in emergency cardiac surgery, where rapid reversal is crucial to minimize perioperative bleeding risks. While Idarucizumab is a specific reversal agent for Dabigatran, extracorporeal removal techniques, such as Cytosorb hemoadsorption, have gained attention as effective alternatives, especially in cases requiring cardiopulmonary bypass (CPB). Cytosorb has demonstrated efficacy in reducing circulating Dabigatran levels, enhancing haemostatic management in critical surgical settings.

Methods

An 80-year-old female patient with a history of atrial fibrillation on chronic Dabigatran therapy presented with worsening dyspnea and congestive heart failure due to severe mitral regurgitation. Following initial medical stabilization, she was scheduled for urgent mitral valve repair. Given her recent intake of dabigatran and the associated haemorrhagic risk, Cytosorb hemoadsorption was integrated into CPB to facilitate anticoagulant removal and optimize perioperative haemostasis.

Preoperative laboratory tests revealed a dabigatran level of 74 ng/mL, with an activated partial thromboplastin time (aPTT) of 43 seconds and an international normalized ratio (INR) of 1.48. Intraoperatively, the patient underwent CPB for 77 minutes with an aortic cross-clamp time of 45 minutes.

Results

Cytosorb was positioned in the extracorporeal circuit in a post-pump configuration, allowing continuous hemoadsorption throughout CPB. Postoperatively, Dabigatran levels were significantly reduced, with a measured post-CPB level of 12.3 ng/mL, accompanied by an INR of 1.80 and an aPTT of 80 seconds, without excessive bleeding or hemodynamic instability. Quantra analysis showed a pre-CPB clot stiffness of 188 and a post-CPB value of 185, indicating maintained coagulation integrity. The patient remained stable in the intensive care unit, with progressive normalization of coagulation parameters and a total blood loss of 750 ml.

Conclusion

This case highlights the successful use of Cytosorb hemoadsorption for Dabigatran removal in an emergency mitral valve repair setting. Cytosorb effectively reduced anticoagulant levels, mitigating perioperative bleeding risks and allowing for safe surgical intervention. These findings support the role of extracorporeal hemoadsorption as a valuable tool in managing patients on direct oral anticoagulants requiring urgent cardiac surgery.