Suspected Intra-operative Anaphylactic Reaction to Heparin

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A 79 year-old man was scheduled to endovascular repair of an abdominal aortic aneurysm. His medical history included a myocardial infarction in 2007, hypertension, gastroesophageal reflux disease, glaucoma, hyperlipidemia, and rheumatoid arthritis. A nuclear stress in 2017 showed no wall motion abnormalities and normal left ventricular function. He had known allergies to bronopol (rash), diazolidinyl urea (dermatitis), dmdm hydantoin (dermatitis), imidurea (dermatitis), and quaternium-15 (dermatitis). His procedure was performed under general anesthesia with an endotracheal tube. He received fentanyl, propofol, and rocuronium on induction and his airway was secured with a 7.5 endotracheal tube. A radial arterial line was placed for hemodynamic monitoring and access for repeated intraoperative blood draws. Cefazolin was given prior to incision for surgical prophylaxis.

Ten minutes after incision, 5000 units of heparin were given to the patient. Within two minutes of administration, the patient experienced sudden profound hypotension with systolic blood pressures decreasing from the 120s to the 40s. This was communicated immediately to the surgical team. Intraoperative imaging confirmed the absence of hemorrhage. Arterial blood pressures correlated with noninvasive blood pressures from both upper extremities as well as a femoral arterial line placed by the surgical team. Breath sounds were clear bilaterally and peak pressures remained grossly unchanged. The patient was treated with fluid boluses, phenylephrine, vasopressin, and epinephrine immediately upon recognition of hypotension with slowly progressive improvement. A low dose epinephrine infusion was started to maintain normal hemodynamics. An intraoperative transesophageal echocardiogram was performed by a cardiac anesthesiologist and did not reveal any major cardiac abnormalities.

The leading diagnosis in our differential became an anaphylactic/anaphylactoid reaction. Once hemodynamic improvement was observed, the record was reviewed to determine whether the patient’s hypotension coincided with the administration of any particular medication. Induction medications were given approximately 1 hour prior to the event. Cefazolin and dexamethasone were given approximately 30 minutes prior to the event. No other medications were given by either the anesthesia or surgery teams. Heparin was presumed to be the agent that triggered his anaphylactic response. Bivalirudin was used for anticoagulation for the remainder of his surgery. At the conclusion of the case, the surgical drapes were removed revealing a macular rash over his abdomen and groin. He remained intubated and was transported to the intensive care unit for hemodynamic monitoring. He was extubated the following day without complications. A tryptase level collected one hour after his reaction was elevated to 48.6.
Although heparins are one of the most used class of anticoagulants, immune-mediated hypersensitivity reactions to heparins, particularly systemic immediate-type anaphylactic reactions, are rare. A few isolated cases of anaphylaxis have been described in the literature. In one instance, a series of cases of anaphylaxis associated with heparin administration were later found to be caused by contaminants. In situations in which allergic hypersensitivity to heparin is suspected intraoperatively and anticoagulation is required, potential alternative anticoagulants include the hirudins as well as direct thrombin inhibitors such as argatroban and dabigatran.