

Title	Lepirudin for Carotid Endarterectomy in a Patient with Heparin-Induced Thrombocytopenia
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INTRODUCTION

Heparin-induced thrombocytopenia is an uncommon but serious medical condition. An adverse reaction to heparin, it is present in approximately 3% of patients after several days of heparin anticoagulation. When the condition occurs in patients needing vascular surgery, alternate means of anticoagulation are necessary. We describe a case in which lepirudin is used in place of heparin for carotid endarterectomy.

CASE REPORT

A 62-year-old, 84 kg male, ASA IV, presented for left-sided carotid endarterectomy with focal neurological deficits and high grade left carotid stenosis. His past medical history included hypertension, peripheral vascular disease, hypercholesterolemia, and unstable angina. He had sustained an acute myocardial infarction 4 months prior, followed by an emergent 3 vessel CABG. His postoperative course was complicated by a right ventricular infarct, recurrent SVT, and prolonged ICU course requiring IABP support, multiple vasopressors, and eventual pacemaker placement. During his hospitalization, he developed heparin-induced thrombocytopenia, confirmed by a positive HIPA (heparin induced platelet antibody) assay. He eventually was discharged, but later developed dizziness, right-sided weakness and was found to have bilateral carotid stenosis (L > R) requiring surgical intervention.

After adequate pre-operative evaluation, the patient was premedicated and brought to the OR where standard monitors were placed. A right femoral arterial line was placed, as radial pulses were barely palpable bilaterally. An uneventful intravenous induction was performed, the patient was nasotracheally intubated, and anesthesia maintained with N2O, isoflurane, and boluses of rocuronium. EEG monitors were placed and the surgery commenced. A baseline ACT was drawn (115), and pre-op aPTT reviewed (25.9). Prior to cross clamping of the left internal carotid artery, a bolus of 6.8 cc of lepirudin was given (0.4 mg/kg), followed by an infusion of 150 mcg/kg/hr. After obtaining an ACT of 279 and an aPTT of 78.1 (>2.5 times control), the carotid was clamped. During the 60 minutes of cross clamp time, the ACT was rechecked (222), an additional lepirudin bolus was given, and the infusion was increased to 180 mcg/kg/hr. The surgeons reported adequate surgical conditions throughout the case. After unclamping, the ACT remained at 234, and the lepirudin infusion was discontinued. At the end of the case, the patient was extubated under deep anesthesia, awoke in the operating room, and was transported to the ICU in stable condition. An aPTT of 29.4 was obtained on post-op day one. After a short uneventful ICU stay, he was transferred to the wards, then discharged home on the second post-operative day. There were no post-operative complications.

DISCUSSION

Heparin induced thrombocytopenia occurs in 1-30% of patients exposed to full dose heparin anticoagulation for several days. It may present as isolated mild thrombocytopenia (Type I) or may be severe, associated with a variety of thromboembolic complications such as DVT, PE, MI, CVA, or vascular occlusion (Type II). Diagnosis is confirmed by HIPA assay. It is initially treated by discontinuing heparin therapy, but may require treatment with heparin alternatives if the thrombocytopenia is severe or thromboembolism occurs. Lepirudin (recombinant hirudin) is among the alternatives. A direct thrombin inhibitor, it does not interact with heparin antibodies, nor does it require antithrombin III for activation. There is no known reversal agent for lepirudin, but it has a relatively short elimination half-life of 30 to 60 minutes. Although not indicated for surgical anticoagulation, several recent case studies have shown lepirudin to be useful in vascular surgery cases (CABG, AVR, PTCA, embolectomy) when heparin is contraindicated. There is no consensus on the best way to monitor lepirudin anticoagulation. ACT, aPTT, and ECT (ecarin clotting time) have all been used, the latter being recommended by several study authors. However, ECT is not available at all centers. Although it has been stated that ACT and aPTT show poor correlation with plasma lepirudin levels, we successfully used them, along with clinical signs of adequate surgical anticoagulation, to monitor lepirudin therapy during carotid surgery.